

years of excellence

Damir Sapunar Livia Puljak



Translational Research in Biomedicine Postgraduate Doctoral Program Translational Research in Biomedicine (TRIBE) Postgraduate Doctoral Program — 10 Years of Excellence

Damir Sapunar, Livia Puljak

Split, Croatia, 2023

University of Split, School of Medicine Translational Research in Biomedicine (TRIBE) postgraduate doctoral program

Publisher University of Split, School of Medicine

Authors Damir Sapunar, Livia Puljak

Design Maša Vukmanović, Ela Meseldžić Creative studio Maša Vukmanović

Printed by Printera

Translation Dora Derado Giljanović

CIP — Katalogizacija u publikaciji Sveučilišna knjižnica U Splitu UDK 61:57>378(497.583 Split)

Damir Sapunar Translational Research in Biomedicine (TRIBE) Postgraduate Doctoral Program - 10 years of excellence

Damir Sapunar, Livia Puljak. — Split, University of Split School of Medicine, 2023.

Prijevod djela: Poslijediplomski doktorski studij Translacijska istraživanja u biomedicini TRIBE — 10 godina izvrsnosti.

ISBN 978-953-7524-34-0

1. Puljak, Livia Higher education — Split II. Biomedicine Croatia

Copyright @ 2023 All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior permission of the copyright owner.





Translational Research in Biomedicine (TRIBE) Postgraduate Doctoral Program -10 years of excellence

Damir Sapunar Livia Puljak

Contents

| 9 | Foreword | | | | | |
|----|--|--|--|--|--|--|
| 13 | History of the program or how to organize a good | | | | | |
| 17 | Beforms introduced by TRIBE | | | | | |
| 10 | Selection of candidates | | | | | |
| 24 | Enclling a limited number of students | | | | | |
| 24 | Lialping condidates to proper of students | | | | | |
| 20 | | | | | | |
| 20 | Tullion lees | | | | | |
| 20 | | | | | | |
| 20 | | | | | | |
| 30 | A system reforms | | | | | |
| 33 | which reforms were ultimately implemented? | | | | | |
| 37 | Good things we can be proud of | | | | | |
| 39 | Evaluations | | | | | |
| 45 | Continuous monitoring and analysis of scientific output at the | | | | | |
| | level of the TRIBE program | | | | | |
| 46 | Feedback from doctoral students | | | | | |
| 46 | Continuous improvement | | | | | |
| 46 | The number of doctorates obtained at the program | | | | | |
| 48 | Time to degree | | | | | |
| 48 | Scientific output of TRIBE's students | | | | | |
| 49 | Monitoring completed doctorates | | | | | |
| 49 | Changing mentors and resolving possible issues | | | | | |
| | between mentors and doctoral students | | | | | |
| 50 | Small number of students dropping out of the program | | | | | |
| 50 | Mentors supervising students | | | | | |
| 52 | Foreign students | | | | | |
| 53 | Montorship awarda | | | | | |
| 54 | IT support for organizing lectures | | | | | |

| 55 | Ensuring academic integrity |
|-----|---|
| 59 | Public availability of doctoral dissertations at TRIBE |
| 59 | Availability of data on which dissertations are based |
| 60 | Data repositories |
| 61 | Diploma supplement |
| 62 | Latin honors |
| 63 | Contact with students and data access |
| 66 | Public relations and promoting the program |
| 67 | Courses and lectures |
| 68 | The Laboratory animal science course |
| 71 | The course How to write a systematic literature |
| | review: basics of methodology and practical steps |
| 73 | Problems with leading the program |
| 76 | Problems with doctoral dissertation topics |
| 76 | The problem of systematic literature reviews |
| 83 | The undesirability of questionnaire-based research |
| 84 | The undesirability of soft science dissertations |
| 87 | The problem of clinicians obtaining doctorates on |
| | topics that are not closely related to their profession |
| 88 | The problem of topics that "don't belong" to |
| | biomedicine |
| 93 | Changing research protocols during studies |
| 94 | Organizational problems |
| 94 | Engaging external teachers |
| 95 | Pressure to enroll students in the program |
| 96 | Administrative support |
| 98 | Excluding representatives of the Program from the |
| | Committee for Doctorates |
| 99 | The Program's finances |
| 105 | Teaching plan and program |
| 108 | The program from its establishment to the academic year |
| 112 | The program from the academic year $2016/2017$ to $2021/2022$ |
| 12 | Changes to the program in the academic year 2021/2022 |
| 122 | |
| 127 | Our students |
| 141 | Doctoral dissertations defended at the TRIBE program |
| 209 | And here we are at the end of the book |
| 211 | What our students have said about the Program |
| 218 | A few words to wrap up |

141 Dissertations of the TRIBE program

| 142 | Andabaka Tea | 183 | Maxwell Lara Jane |
|-----|--------------------------|-----|-------------------------|
| 143 | Babić Andrija | 184 | Mustapić Sanda |
| 144 | Baković Marija | 185 | Petković Jennifer |
| 145 | Banožić Adriana | 186 | Poklepović Peričić Tina |
| 146 | Barčot Ognjen | 187 | Pranić Shelly |
| 147 | Bašić Željana | 188 | Prkić Ivana |
| 148 | Biočić Marina | 189 | Puharić Drita |
| 149 | Borić Katarina | 190 | Restović Ivana |
| 150 | Borić Krste | 191 | Rod Eduard |
| 151 | Borić Matija | 192 | Roguljić Marija |
| 152 | Bošnjak Kuharić Dina | 193 | Roje Blanka |
| 153 | Brčić Luka | 194 | Runjić Edita |
| 154 | Brković Tonći | 195 | Sharp Melissa Kathleen |
| 155 | Bukić Josipa | 196 | Stevens Adrienne |
| 156 | Buljan Ivan | 197 | Stipčić Ana |
| 157 | Bušelić Garber Ivana | 198 | Sarić Lenko |
| 158 | Došenovic Svjetlana | 199 | Sešelja Perišin Ana |
| 159 | Ferhatović Lejla | 200 | Simundić Munitić Marija |
| 160 | Gabelica Mirko | 201 | |
| 161 | Garritty Chantelle Marie | 202 | Tomljenović Helena |
| 162 | Gelemanovic Andrea | 203 | |
| 163 | Gionti Ketevan | 204 | |
| 104 | Hamel Candyce | 205 | |
| 100 | Inidual Jerko | 200 | VUKa IValla |
| 167 | | | |
| 168 | lurić Diana | | |
| 169 | Kliučević Nikola | | |
| 170 | Ključević Želiko | | |
| 171 | Kostić Sandra | | |
| 172 | Krnić Martinić Marina | | |
| 173 | Leskur Dario | | |
| 174 | Lešin Mladen | | |
| 175 | Lušić Kalcina Linda | | |
| 176 | Malički Mario | | |
| 177 | Markotić Filipa | | |
| 178 | Marković Domagoj | | |
| 179 | Mastelić Angela | | |
| 180 | Matana Antonela | | |
| 181 | Meštrović Zoran | | |
| 182 | Milat Ana Marija | | |

^

Foreword

To lead a good postgraduate doctoral program is no easy task. As one of our friends jokingly said: "It's easy to be the best, but it isn't easy to be good!". And TRIBE is a good program. After ten years of managing TRIBE, we can support this claim with data on our students' success and external recognition. It is precisely this data that gives this book its meaning. It is our wish to document these successes, recording the good and the bad, in order to pass our experiences on to others and, ultimately, raise the bar for quality of doctoral programs in Croatia. The tenth anniversary is the right time to remember all the lovely people that have been with us on this journey, all in one place.

When you're establishing a new educational program, you have to prepare documents with a detailed plan. Some of the claims from that plan often sound like empty phrases or dubious promises, in some of which you yourself do not believe. However, after ten years, you can feel a lot more relaxed because you have what scientists love the most — data to rely on. When we look at this data with ten-year hindsight, we can claim that we have achieved everything that we planned for, and even more then that.

The success achieved by the TRIBE program is rather incredible because we work in a very conservative surrounding resistant to any kind of change. In truth, postgraduate doctoral programs are a hidden and unknown academic battlefield. Those intending to implement reforms on this battlefield can expect a lot of pushback. The uninitiated observer may well ask why the word battlefield is used to describe something as innocent as postgraduate doctoral programs. But those more experienced and initiated into the ways that higher-education institutions function know that the passions and emotional tensions surrounding doctoral programs are strong enough to entirely justify using such a term in this context.

Postgraduate doctoral programs represent the highest level of formal education. Their objective is to educate new doctors of science and art through the creation of a doctoral dissertation, based on original scientific research. These programs are a place where doctoral students learn to grapple with previously unsolved problems. They are also quardians of the entry gate into the academic community, which, in Croatia, still provides a relatively comfortable and well-paid job. Consequently, controlling doctoral programs entails a certain amount of power, and nobody is immune to these types of motives. Since obtaining a doctoral degree is a prerequisite for advancing in the academic ranks, this makes it the ideal currency for the academic community, which is plaqued by corrupt staffing policies and that was, and remains to this day, a distributor of services in exchange for support, while guality, ideas, and programs remain nothing more than additional baggage. Unfortunately, in this flawed process, international indicators of quality and measurable outcomes are not necessarily a priority. The people in charge of deciding on the processes for obtaining a doctorate are in a position to make decisions that affect careers in the academic community, ones that are not necessarily based on equal criteria for all students. These decision-makers often have a conflict of interest because they make decisions pertaining to their colleaques, which opens up the door to clientelism, while attempts at involving international experts in this process fall flat as soon as they appear.

A lack of transparency in the management of postgraduate doctoral programs and the deficiencies noticed by the body that oversees them — the Agency for Science and Higher Education (ASHE) — have multiple negative consequences, including poor scientific output, financial implications, reputational damage, and generally a worse representation of doctoral programs. 1 A while back, we had an idea to write a scientific article on the success rate of postgraduate doctoral programs in the field of biomedicine in Croatia, whereby we defined success, among other things, as the percentage of students that obtained a doctoral degree, the average number of years from enrollment to graduation, and the number of international publications stemming from the candidate's

1 Doktorski studiji u Hrvatskoj, stajalište Agencije za znanost i visoko obrazovanje na temelju rezultata vanjskog vrednovanja doktorskih studijskih programa provedenog u 2016. i 2017. godini. [Doctoral programs in Croatia, view of the Agency for Science and Higher Education based on the results of an external evaluation of doctoral programs conducted in 2016 and 2017]

https://skazvo.azvo.hr/images/stories/dokumenti/4 Position_paper_za_doktorske_programe.pdf dissertation. We were unable to conduct such research on a national level because other institutions were unwilling to provide the data. It is easy to explain why institutions hide those data — because they cannot be proud of them. This is why TRIBE aims at complete transparency. TRIBE's publicly available website



Directors of the TRIBE program, Livia Puljak and Damir Sapunar

contains a list of enrolled students, a list of students that have graduated, full texts of defended doctoral dissertations, and references to publications in scholarly journals stemming from the dissertations. One of the causes of numerous problems within doctoral programs, which is not popular to mention, is money. Indeed, a lot of money is generated in doctoral programs in Croatia. Doctoral programs are very profitable because most students

pay tuition fees. The fees are high, often inexplicably high, and can, in some institutions, amount to more than 5 000 Euros per year, which is a lot of money in Croatia. 2 This is why postgraduate programs are the "golden geese" of higher-education institutions, providing institutions and professors opportunities to earn additional income. Thus, a large number of students are indiscriminately enrolled, without considering whether or not these students have a realistic chance of completing those studies. Additionally, some institutions are charging those tuition fees even to their own employees who are just entering academia (a practice which, for some time, existed even at our School), a constant influx of significant funds is guaranteed. These monetary gains can enable those leading the programs and everyone related to the programs to live a cushy life.

Doctoral programs in Croatia thus bear the burden of monetary interest and conflicts of interest, instead of being the main driving force of an institution's scientific progress. Still, when you remove all the useless noise that makes working at a doctoral program so tedious, you're left with the most beautiful part of the job: working with exceptional students who want to progress and who, through their work, ideas, and enthusiasm, ennoble you and make you a better person.

As directors of the TRIBE program, we are proud that, in these ten years, more than half of the students enrolled have gone on to successfully defend their doctorates, which is on par with doctoral programs from the USA. We are proud to be one of the rare programs that got an excellent grade during the international re-accreditation of postgraduate

> doctoral programs in Croatia. That is why we can proudly speak of the ten years of excellence of the TRIBE program. We want to thank everyone that helped achieve this!

2 A guide to doctoral programs of the University of Zagreb http://www.unizg.hr/fileadmin/rektorat/ Istrazivanja/Poslijediplomski/Ured_za_doktorske_ studije_i_programe/Publikacije/Vodic___kroz_dok torske_studije_2019-2020_web.pdf

History of the program or
 how to organize a good postgraduate
 doctoral program

The TRIBE postgraduate doctoral program was established in the academic year 2010/11. The process of approving new doctoral programs was, even then, very clearly defined by the documents of the University of Split School of Medicine. The establishment of a new doctoral program begins with the preparation of detailed documentation that must contain a feasibility study. The Doctoral School (hr. Doktorska škola) takes into consideration the motion for the new postgraduate program, it provides its opinion, and the School Council (hr. Fakultetsko vijeće) accepts the motion. The School Council's decision is then delivered to the Center for Quality Improvement (hr. Centar za unaprjeđenje kvalitete) and the University Senate (hr. Senat Sveučilišta) for final approval. The decision to accept the motion to inaugurate the TRIBE program was made on February 4, 2010. The first contracts with students for enrollment were signed in May of 2011.

Before TRIBE was established, the University of Split School of Medicine already had two other postgraduate doctoral programs. The first established program was "Evidence-Based Medicine", which was geared towards educating doctoral students who were interested in clinical practice. The second established program was "Biology of Neoplasms", devoted to clinical and preclinical cancer research.

When founding the TRIBE program, the guiding principle was training students for independent scientific research in basic biomedical sciences and translating the research from basic sciences into biomedical practice. With the addition of the TRIBE program, the three postgraduate programs at the School represented the ideal basis for promoting interdisciplinarity.

The vision of TRIBE was to prepare doctoral students for work in biomedical research teams, researching new therapeutic

modalities and influencing the currently viable paradigms for conducting biomedical research. Students learn about medical evidence, designing and conducting interdisciplinary research, and translating their research findings into better outcomes for healthcare. In the process of writing their doctoral dissertations, candidates learn methodological principles that are specific to a particular scientific discipline.

Due to its interdisciplinarity, the plan was for TRIBE to take on an essential role in educating the scientific research personnel for the then-new programs at the University of Split School of Medicine: the Dental Medicine program, the Pharmacy program conducted jointly by the School of Medicine and the Chemical and Environmental Technology Faculty of the University of Split: the university programs of nursing. midwifery, medical laboratory diagnostics, radiological technology, and physiotherapy at the University Department of Health Studies; and the Psychology program at the Faculty of Humanities and Social Sciences. Without engaging more staff in scientific research, there is no adequate development of new university studies. Thus, the basic premise of founding these programs would be lost. The only way for these fields to truly develop is by scientifically and professionally training their personnel, who will be the foundation of future growth. Until TRIBE was founded, enrollment in postgraduate doctoral programs at the University of Split School of Medicine was reserved almost entirely for physicians. After our first ten years, we can confirm that TRIBE has significantly changed who can enroll in the biomedical doctoral program. Namely, TRIBE enrolled not only physicians but also doctors of dental medicine, pharmacists, nurses, psychologists, special education and rehabilitation specialists, speech therapists, chemists, engineers, sociologists, and other professions, which is something we are particularly proud of.

Still, the primary reason behind founding TRIBE was reforming the existing doctoral education system and improving doctoral students' success rates. An internal analysis of the success rate of doctoral programs at the University of Split School of Medicine, conducted in 2011 by one of the authors (LP) while serving as the vice dean for science, indicated the unacceptably low success rates of these programs. The analysis showed that, between 1999 and 2011, only 11% of students that had enrolled in and completed the three-year doctoral program at the School of Medicine in Split obtained their doctorate.

Thus, we aimed to reform the system and improve the quality and success rate of obtained doctorates using an innovative approach to the organization and delivery of the program. We based our planning of the reform on the idea that high-quality doctoral education is necessary for educating scientists and is the main driving force behind institutional scientific output.

Reforms introduced by TRIBE

We considered that establishing a new doctoral program identical to the existing ones would make absolutely no sense. By founding a new program, we wanted to introduce novelty, create a contemporary and innovative program and, in so doing, encourage others to change as well. Our reforms targeted the program management and the structure of postgraduate education at the School.

Our reformist approach to organizing the program was based on interventions in three areas:

a) selection of students,b) the rules of studying, and

c) the curriculum.

We believed that those interventions would increase the success rate of obtaining a doctorate and decrease the time to the dissertation defense. From the very start, we had also decided to enroll a small number of students, to work intensely with potential students so they could best prepare for enrollment in the TRIBE program, and on a realistic approach to tuition fees.

We presented our experiences related to the implementation of these interventions in the TRIBE program in the scientific article "Improving completion rates of students in biomedical doctoral programs: an interventional study", which was published in 2017 in the journal BMC Medical Education. 3

3 Vidak M., Tokalić R., Marušić M., Puljak L., Sapunar D.: Improving completion rates of students in biomedical PhD programs: an interventional study. BMC Med Educ. 2017;17(1):144.

| Intervention areas | Specific measures | Explanation of the intervention | Expected outcome |
|-------------------------|---|---|---|
| Selection of candidates | Selection criteria | The main enrollment criterion is based on submitting a feasible research plan, with realistic funding options, available equipment, and a proposed mentor | At the time of enrollment, students have a defined, feasible research protocol and a mentor |
| | An interdisciplinary approach to student recruitment | Openness towards candidates from all scientific disciplines, as long as their doctoral research topic is in biomedicine | The creation of interdisciplinary teams that work together on biomedical research |
| Program regulations | Student progress reports | Two mandatory annual reports as the main indicators of students' research progress | Continuous insight into the students' research progress and helping students who are not progressing adequately |
| | Strict rules on enrolling in subsequent years | There are four examination terms per year for each exam (including for the two annual reports). If a student does not pass all their exams, they have to repeat that academic year. It is permitted to repeat the year only once. If the student is not able to pass an exam within the eight exam terms, i.e., over the course of two academic years, they are unenrolled from the program | Passed all exams for the current academic year |
| Curriculum | Formal education in key competencies | Introducing the following courses: Laboratory management, Research skills, Entrepreneurship and technology transfer, Ethics in research, Communication and presentation skills | Acquisition of basic skills for a successful research career or any other career |
| | Orientation towards the development of a quality research plan | Mandatory completion of at least two detailed research protocols by the end of the first year, presented in written and oral form | Having at least two rese- arch protocols entirely defined by the end of the first year of the program to increase the complexity of the dissertation |

Selection of candidates

The changes in the process of selecting students included the introduction of mandatory submission of a research protocol when applying for enrollment and an openness towards candidates from other scientific disciplines who plan to conduct biomedical research. We noticed a pattern by analyzing

students who enrolled in other doctoral programs at the University of Split School of Medicine and failed (i.e., did not manage to complete the program many vears after enrollment). Those students did not have a mentor or any research plan upon enrollment. At that time, other doctoral programs at the University of Split School of Medicine enrolled students based solely on their grade point average (GPA). Students would be ranked based on their GPA and the top 20 would be enrolled. Nobody asked those students what they intended to study within their doctoral dissertation and who their mentor would be. Students who were enrolled in such a manner often complained about the fact that nobody had tried to help them find a mentor and define their research topic. Excellent grades from previous education cannot guarantee a student will successfully complete a doctorate program. Namely, in doctoral programs, it is not enough to just pass exams - to defend their dissertation, students must conduct research and publish articles in scholarly journals. And this is not possible without a feasible research protocol and a mentor.

We thus concluded that our reform must include a better selection process, or rather that students must present a research protocol and propose a mentor (with whom they had agreed to collaborate and had developed their research protocol) already at the enrollment stage. We also decided that the GPA would be irrelevant for enrollment. Thus, TRIBE has never had a GPA threshold as one of the enrollment conditions.

Having a detailed research protocol

at the time of enrollment allows students to recognize the elements of the curriculum that will be particularly important for their doctoral studies. This approach has led to a very rigorous enrollment process from

the beginning, with many applicants being rejected. However, the percentage of enrolled applicants has eventually increased as TRIBE's principles became well-known among prospective students and mentors. The candidates realized that the only way to enroll in TRIBE was by having a well-prepared research protocol. TRIBE's website contains comprehensive information about our requirements and a template for preparing a research protocol. We encourage applicants to contact us at any time during the academic year and we explain to them, either verbally or via email, what is required to enroll in the TRIBE program. We discourage candidates with poor research plans from applying, and we try to help them prepare better for the next academic year. We have included the research protocols on the list of obligatory documents that need to be submitted with the application for enrollment in the program. Thus, over the last few years, we have gotten to the place where we do not receive any official applications without research protocols and a mentor.

At the beginning of the program, we asked candidates only to submit a motivation letter in which they were required to state what they planned to study and name their mentor. However, during the first students' progress reports, when they had to submit their detailed research protocols, we realized that this was not enough. Namely, during these progress reports, some of the students presented research protocols containing major methodological flaws, i.e., studies that were not appropriately designed to achieve the stated research aim(s). Given that students are expected to prepare their research protocol with the help of their mentors, the only possible explanation to us was that their mentors did not possess enough knowledge of research methodology to help them design a feasible study.

We then started to request that applicants submit a complete research protocol with their application for enrollment. Of course, this approach requires significant effort from students and mentors even before enrolling and significant commitment on behalf of the program directors who evaluate these protocols. But the benefits of this approach are two-fold.

The number of students who applied and enrolled in the TRIBE program since its inception in 2010

Number of applicants



Firstly, even before enrolling, students have the opportunity to "test" their mentor and see whether the mentor they chose will support them adequately throughout the doctoral program. Secondly, insight into a complete research protocol enables the program directors to evaluate the feasibility of the proposed studies. This allows us to select students with the highest chances of graduating. After all, our goal is for all enrolled students to obtain their doctorates. If students are enrolling in a doctoral program without a mentor and a defined research plan, it is unrealistic to expect many of them to graduate, as we have witnessed from previous results of doctoral programs at the University of Split School of Medicine.

The next major shift in our expectations from candidates for enrollment came in 2016 after the School received criticism from ASHE's Reaccreditation Committee, which stated that the scope of scientific research in the doctoral dissertations defended at the School was insufficient, or rather modest, and generally based on only a single piece of research. Indeed, many dissertations defended at the School were based on one study only. This was based on the School's bylaws, which required the publication of one research article from the dissertation. As a result, most

students opted for that minimum - to conduct only one study within their doctoral dissertation and publish it in one research article. As a response to the criticism, we changed our enrollment criteria at the program level. TRIBE's Council decided to start requiring candidates to submit protocols for at least two related research projects, both of which would be conducted as part of their doctoral studies. In doing so, we believed we were not only responding to ASHE's criticism, but also fostering students to conduct better dissertations and helping them defend their dissertation

faster. Namely, according to the School's bylaws, doctoral students must publish two scientific articles as a prerequisite for defending their dissertation, but only one of those two articles must be related to the topic of their dissertation. We noticed that students sometimes struggled to publish the second article as it was usually not related to their dissertation. Therefore, we Concluded that multiple issues would be resolved if students had to conduct at least two studies within their dissertation and publish two articles, which would then both be related to their dissertation topic.

On multiple occasions, we received complaints about our "extraordinary" expectation that students and mentors need to prepare two research protocols even before the student's enrollment. These complaints can be divided into two groups. The first group pertains to questions such as what students will do when they enroll in the program if we request that they already prepare research protocols before enrollment. Those comments come from individuals who expect that students will enroll into a doctoral program and only then start defining their dissertation topic. Our response is that, during their postgraduate studies, students will work on their research plans and, if necessary, adjust them subsequently. During the first few years of the program, we have seen what happens to students who do not have a detailed research plan at the time of enrollment, and we do not want to see that again. In our setting, it is not in the students' best interest to enroll in a postgraduate program and pay tuition only to have to look for mentors and draft their research protocols for years to come.

The second type of complaint states that only rare individuals are capable of preparing two research protocols, such as the ones we request upon enrollment. Our response is that, in the TRIBE program, we do not want students and mentors who cannot prepare viable research protocols. This is the exact point of our high expectations — to see at the very start which student-mentor dyads can prepare feasible research protocols. These high expectations must also be considered in the context of the criteria for obtaining a doctorate at our institution. To defend a



doctoral dissertation at the University of Split School of Medicine, students must publish two scientific articles in indexed journals with a Journal Impact Factor of ≥ 1 . It is not possible to publish such articles without a suitable research protocol. Our requirement that students need to prepare two research protocols prior to enrollment thus enables students to achieve the expected criteria for dissertation defense. A mentor who cannot help a mentee to write two research protocols will not be able to help them publish two journal articles.

Rather, what is important is that the candidate plans on doing biomedical research. In this way, we encourage the creation of **interdisciplinary teams** in biomedicine.

Apart from strict criteria for enrollment in TRIBE, the second reform pertaining to our selection of candidates is related to their previous education. Candidates who have obtained education in scientific fields outside of biomedicine, but whose proposed research topics are related to the field of biomedicine, can be enrolled in the TRIBE program. This type of approach is accepted as a best practice worldwide as international institutions accept students of various profiles who are interested in biomedical research into their doctoral programs. The background of a candidate is, thus, less important. Rather, what is important is that the candidate plans on doing biomedical research. In this way, we encourage the creation of interdisciplinary teams in biomedicine.

Enrolling a limited number of students

When TRIBE was established, we proposed to enroll a maximum of 15 students per year, which is significantly less than the enrollment quota for the other two postgraduate programs at the School. The idea was to enroll a smaller number of students that would be provided with a high level of support. In eight of the 11 generations that were enrolled by the beginning of 2021, we enrolled less than 15 students. We opted to enroll fewer students than we could because we were not interested solely in their tuition. We wanted to enroll only students whom we estimated to have a realistic chance of obtaining their doctorate in a reasonable amount of time based on the research plans presented to us.

Helping candidates to prepare for enrollment

We encourage potential TRIBE candidates to contact us well before September, which is the deadline for enrollment applications every year. We are happy to explain to the candidates how we work at TRIBE and encourage them to prepare the best possible research protocols. We provide methodological advice and, if needed, connect them with potential mentors. We thus invest some of our time in people that may never enter the TRIBE program, but we believe that this type of investment is justified based on the idea of TRIBE being a program where candidates and students are provided with extensive support. Some candidates enroll in TRIBE on their second or third attempt. Some contact us once and never again. Some end up enrolling in another, much less demanding doctoral program and complain to us, after five or six years, that they still do not have a topic or a mentor. Our advice to all the candidates is that they should not enroll in any doctoral program in Croatia unless they have a well-developed research topic as well as a mentor. Unfortunately, some of these candidates do not want to follow our advice. Individuals see that someone else has enrolled in a doctoral program, so they want to enroll in one too. Moreover, public calls for physician residencies often include giving additional points to candidates enrolled in a doctoral program. This prompts physicians to enroll in a doctoral program simply to get more points for potential employment. We find this practice undesirable because a student that has been enrolled in a doctoral program does not necessarily have to ever obtain their doctorate. Therefore, handing out points just for being enrolled in a doctoral program should be abolished as a bad practice.

Tuition fees

While writing the proposal for establishing the TRIBE program, one of the Directors (DS) prepared a feasibility study and calculated the minimum tuition fee for the program to be feasible, bearing in mind a limited number of enrolled students. Based on these calculations, he suggested a tuition fee of 2,100 Euros per academic year, which is one of the lowest tuition fees for a postgraduate program in Croatia. During the first 10 years of the program, the tuition fee did not change, since we saw over time that the initial feasibility study adequately predicted the expenses for running the program.

Rules of the program

Doctoral programs in Croatia generally include mandatory and elective courses that students must attend and pass. We have additionally introduced two mandatory annual progress reports for which students must prepare a written progress report and an oral presentation. Over the course of their three-year studies, students have to pass six progress reports, which are graded based on a) the scientific quality of the student's research plan, b) their research progress, and c) the quality of their presentation.

At the start of the TRIBE program, these progress reports were not graded. We soon came to realize that this had to be changed. Namely, students mostly got excellent grades in mandatory and elective courses so some of them would state in their progress reports that they had passed all their courses with the



Marin Viđak in front of his poster in 2019

ad passed all their courses with the best grades, without showing any concern for their complete lack of research progress since their last report. So, we decided to start grading the progress reports. For each progress report, students can get grades ranging from one (1) to five (5). In the Croatian educational system, one is a non-passing grade, whereas passing grades range from two (sufficient) to five (excellent). Once the progress reports became graded courses, students realized



Upper photo Presentation of the students' posters in 2015

Lower photo Presentation of the students' posters in 2019

that this was their most important exam and that they would not be able to continue onto the next year unless their progress report had received a passing grade.

With progress reports, as with all other exams, we strictly adhere to the rules according to which students are allowed eight attempts to pass an exam within two academic years. Otherwise, students are unenrolled from the program. Also, at TRIBE, students cannot enroll in the following year unless they have passed all the exams from the previous study year. This means that it is impossible to enroll in the next study year if the program directors determine that satisfactory scientific progress has not been achieved. Students that do not pass all the courses for that study year are held back; they need to repeat that same year and pay for the European Credit Transfer and Accumulation System (ECTS) points of the courses they will be retaking.

Curriculum

When training doctoral students, providing knowledge and skills in the core biomedical research principles as well as investing in transferable skills is essential. Within their education on the core research principles in biomedicine, students learn about and create practical tasks centered around the principles of scientific work, searching for medical information, writing scientific articles, evaluating the value of a scientific article, writing scientific projects, biostatistics, working with laboratory animals, and creating a research protocol. Transferable skills include topics such as business communication, scientific communication, public relations and communication management, how to organize a conference, creating a conference poster, working with their mentor, collaboration in science, critical thinking, managing a laboratory, communication and presentation skills, research ethics, entrepreneurship, and technology transfer.

Each exam includes a practical assignment that is often individualized and related to the student's dissertation. Our goal is not to force students to memorize large quantities of facts but to train them to tackle tasks that will be useful to them later on in their scientific careers. For example, in the module on writing scientific articles, students have to write a small research manuscript on a given topic according to the relevant reporting checklist. They then practice preparing the manuscript for submission to a journal and using an online manuscript submission system. Also, students receive a peer review and are expected to revise their manuscript and respond to the peer review. Within the course on entrepreneurship, students have to prepare and present their own entrepreneurial idea. The lessons in statistics are not just theory but a discussion on the specific problems that students will encounter when analyzing data for their dissertations.



A system reform

In June of 2010, the Doctoral School was established at the University of Split School of Medicine, and one of the authors (DS) was appointed as its Acting Director. The Doctoral School was supposed to be the focal point of reforms in the postgraduate educational system at the School. The only way to approach these reforms seriously was to change the bylaws that regulated postgraduate education. A new bylaw was supposed to unite two documents: The Bylaws on Obtaining a Doctorate (hr. Pravilnik o stiecaniu doktorata znanosti) and The Bylaws on Postgraduate Studies (hr. Pravilnik o poslijediplomskim studijima). The Bylaws on Obtaining a Doctorate, in essence, regulated the work of the Committee for Doctoral Dissertations (hr. Povierenstvo za doktorate), which is the body that administers the process of proposing a dissertation topic and of obtaining a doctorate. The Bylaws on Postgraduate Studies, on the other hand, defined the organization of postgraduate doctoral programs. The idea was to resolve everything related to doctoral education in one place, with one set of bylaws, in order to avoid repeating certain directives in both bylaws.

The discussions about the suggested reforms were extremely painstaking. While one group of colleagues was in favor of changes, those who were always against change or who felt that these changes would place their authority at risk mounted resistance. It is interesting to sift through documents from that time and read the correspondences and comments in which all of the suggested reforms are called "sketchy, incomplete, not thought through, and even harmful". The founding of the Doctoral School was met with strong resistance. There was much criticism about establishing a Doctoral School and TRIBE as a new doctoral program. The opponents went so far as to look for ways to "prevent the directors of Interventions incorporated in the former Bylaws on Postgraduate Studies *Cross-disciplinarity refers to viewing one discipline from the perspective of another

| Intervention areas | Specific measures | Explanation of the intervention | Expected outcome |
|-------------------------|--|---|---|
| Organization | The structure of the Doctoral School | Organizing the Doctoral School, which unites all postgraduate doctoral programs of the School | Better integration of existing programs and avoiding repetition of teaching content |
| | A Reform of the Committee for Doctoral Dissertations | Reducing the number of members of the Committee for Doctoral Dissertations with the aim of it functioning like the editorial board of a journal | More efficient work and a larger selection of experts for evaluating doctoral topics |
| | Annual financial reports | Precise definitions of the sums allocated to the School and University from the tuition fees as well as how these funds are managed | Better management of the doctoral programs' finances |
| | No tuition fees for employees of the School | In line with the former Collective Agreement between the Croatian government and the Independent Union of Research and Higher Education Employees | Financially unburdening colleagues who are just entering academia |
| | Providing student scholarships | Allocating funds from individual programs' budgets for scholars- hips to the best candidates | Attracting the best candidates |
| | Introducing tutors/ supervisors | As is a custom in developed academic institutions, students would have an additional person taking care of their improvement alongside their mentor | Higher-quality tracking of students' progress |
| Choice of candidates | Redefining the enrollment criteria | Defining the topic and potential mentor prior to enrollment | A higher success rate of ob-taining a doctorate |
| Curriculum | Openness towards other professions | Openness towards candidates from all scientific disciplines considering that their doctoral research topic is in the field of biomedicine | Educating different types of personnel and encouraging cross-disciplinarity * |
| | More efficient organization of courses | Joint delivery of mandatory courses that are common to all programs, while retaining man- datory courses that are specific to the particular programs | Savings in terms of course organization and higher teaching quality |
| | High-quality student progress tracking and being able to spot problems in their progress on time | Organizing annual assemblies during which students from all programs would present their research and progress | Student progress reports presented before the Doctoral School Council |
| | Writing a doctoral dissertation in English | Candidates can choose to write their dissertation in English | Better international visibility |
| | More focused research and reducing the formal course load | Encouraging non-formal and informal forms of teaching and individualized work for develo- ping students' research plans | Higher-quality knowledge transfer |
| | Writing dissertations that are based on systematic reviews | Promoting systematic reviews as an excellent model for learning about clinical studies | Better education of doctoral students |

this new, bad program from outvoting the directors of the good program in the Council, on any matter whatsoever and thus adapting the system to themselves, dragging it down to a lower energy level". Colleagues threatened by the idea of a new, different doctoral program declared it as "bad" in advance.

Ideas on introducing continuous student progress monitoring through student reports, regular meetings with mentors, engaging mentors from other institutions, and arranging lectures in English also faced much backlash. Many of the objections against the reforms were related to the suggestions for better monitoring of the doctoral programs' finances. The suggested regulations, which precisely defined how the finances would be managed, were called "bad math". Certain individuals were used to spending revenue from tuition fees as they pleased; this spending included awarding hefty honoraria to some teachers for providing statistical counseling, technician work, research equipment, etc. Paving honoraria to teachers from the home institution presented a particular problem. The former Collective Agreement between the Croatian government and the Independent Union of Research and Higher Education Employees stated that teachers employed at an institution are not entitled to an honorarium for lectures that they held at the postgraduate level along with a very explicit statement according to which "there is no possibility of decreeing, through an internal set of bylaws or a mandate, that these lectures should be treated as different from regular classes and, as such, that they should not count towards faculty norms or be compensated for through honoraria". Likewise, the idea of giving scholarships and providing free education for students from the home institution provoked fierce resistance. The main argument for this was that they would ruin the feasibility of the doctoral programs.

The idea of a Committee for Doctoral Dissertations as a smaller body that functions like a journal editorial board, which leans on international reviewers, also did not gain acceptance. The bylaws that were observed up to then called for a large number of members of the Committee for Doctoral Dissertations, 15-20 in total, which included representatives of different research fields. The problem was that, despite many individuals being members of the Committee, it still could not include experts in all fields. Engaging international reviewers would have easily resolved the problem of a lack of experts for specific dissertation topics, and it would have contributed to the internationalization of the existing programs.

Still, as unpleasant as these discussions may have been, they were the only ones where the organization of doctoral programs was debated on in detail. Unfortunately, this had never happened before, nor did it ever happen again. All the big advocates for transparency, international criteria, and scientific excellence had failed their test of faith during these discussions.

Which reforms were ultimately implemented?

Despite the resistance, a part of the suggested reforms was included in the new bylaws, which were in effect until 2011 when the management of the University of Split School of Medicine changed. The time during which the new bylaws were in effect was, unfortunately, too short to thoroughly analyze the results of the reforms.

The Doctoral School was established, but not in its true form. It was supposed to be a meeting ground for people who were truly knowledgeable about postgraduate teaching; one where they could discuss and define the mechanisms of the program with the goal of improving the system. Although the Doctoral School was later often mentioned as a good and innovative approach, it did not achieve its original aims. The Doctoral School was supposed to enable sharing of courses and teachers, which would have resulted in additional savings for the School. This idea stemmed from the fact that certain courses were held at all postgraduate doctoral programs at the School. However, the directors of the other doctoral programs strongly opposed the idea of sharing courses. They wanted to keep the option of engaging (and paying honoraria to) professors that they preferred. One argument against sharing professors and courses was that students pay a high tuition fee for attending postgraduate courses and, in return, they expect to be able to work in smaller groups.

As for the suggestion to allow writing doctoral dissertations in English, it was proposed that the bylaws should explicitly permit students to choose whether they want to write their dissertation in Croatian or English. Unfortunately, 10 years after this suggestion was initially put forward, it still has not been adopted as proposed. According to the bylaws, "The Committee for Doctoral Dissertations can approve the entire process of obtaining a doctorate being carried out in English, including the application, public discussion on the proposed topic, dissertation submission, and the public defense".

This means that students first need to send a written request to the Committee for Doctoral Dissertations in which they ask for approval to write their dissertation in English. The Committee for Doctoral Dissertations then may or may not approve the request. Over the past few years, decisions about such requests were made arbitrarily, on a case-bycase basis, and they depended solely on the current composition of the Committee for Doctoral Dissertations. Multiple student requests to write a doctoral dissertation in English were denied. Even at meetings of the School Council, these requests were discussed in such a way that opponents of this idea would stubbornly assert that such requests should be disregarded because it is necessary to foster our own, Croatian language. Apart from the Doctoral School, some of the sugge-

sted reforms survived to a lesser or greater extent. The idea of students' progress reports was accepted within other doctoral programs. However, TRIBE is, to our knowledge at least, the only program that grades these reports. Additionally, in terms of the enrollment criteria, other doctoral programs started shifting from enrolling students based solely on grades to at least having a conversation about students' research plans. Tuition fees for employees were abandoned and tutors were also introduced alongside mentors.

Doctoral School (...) was supposed to be a meeting ground for people who were **truly knowledgeable about postgraduate teaching**; one where they could discuss and define the mechanisms of the program with the goal of improving the system.

When, with ten-year's hindsight, you see that some reforms were adopted regardless of the resistance they encountered and that some were even accepted by their chief opponents, you would think that one would be satisfied. Unfortunately, this is not so! Gratification means nothing in comparison to all of the sad moments that we lived through with those students who did not get what they could have gotten, the money spent in vain, and the missed opportunities to build up the institution's reputation, which could have achieved better results for all doctoral programs in the accreditation process. Thus, we are sorry for all the time unnecessarily wasted on proving indisputable facts. Also, it has to be emphasized that some of these reforms were introduced only formally and not in the way they should be.

-> Good things we can be proud of

Evaluations

The success of the TRIBE program is analyzed at three levels: national, international, and at the level of the program itself.

The evaluation of the doctoral program on the national level is conducted by the Agency for Science and Higher Education (ASHE) within the national re-accreditation system. So far, the TRIBE program has been included in two re-accreditation cycles. The first was part of the accreditation of the entire activity of individual schools, including doctoral programs. The accreditation was carried out in March of 2015. Although it initially was not designed to evaluate doctoral programs, this accreditation report devoted a significant amount of space to problems within doctoral programs. So, the report from May 18, 2015 states:

"The Institution offers three postgraduate programmes. While two of these appear not to succeed (since the rates of failure are extremely high), the 'TRIBE' programme performs very well and could serve as a model for the two rather less successful PhD programmes. This is important since successful completion of a PhD programme is one prerequisite for an academic career and a well-organized PhD programme with a high success rate will certainly substantially add to the School's reputation. The situation with the doctoral programs in Croatia is to be criticized in general, as they seem to function largely as a source of funds for which students get very little in return. The present system does not serve anybody — not the students, not the research, not the schools. The TRIBE program is convincing as it looks at the research proposals and awards supervisors from day one, so the chances of failing areconsiderably smaller."

We expected that such sharp criticism of doctoral education at the School would lead to a swift reaction with the goal of systemic reform, especially because the international committee identified TRIBE as an example of good practice based on which other doctoral programs could be reformed. But, unfortunately, nothing happened in this regard. Unperturbed, in 2016, the School entered the new re-accreditation process solely aimed at rating the doctoral programs. This re-accreditation was initiated because the previous accreditation identified the bad state of doctoral programs. The Agency for Science and Higher Education's Accreditation Council appointed a seven-member Expert Panel as a nonpartisan expert body so they could independently evaluate postgraduate doctoral university programs.

TRIBE was the only doctoral program, among all the medical schools in Croatia, to get a **"high-quality"** label.

The Expert Panel's final re-accreditation report of doctoral programs at the University of Split School of Medicine, delivered on December 7, 2016, states that the TRIBE program meets all prescribed quality requirements and that it should be identified as a high-quality program and receive a "high-quality" label. TRIBE was the only doctoral program, among all the medical schools in Croatia, to get a "high-quality" label. As examples of best practices, the Panel listed clear enrollment criteria, the contracts signed upon enrollment, the expertise of the professors and mentors, the international nature of the program, regular progress monitoring, innovative dissertations, value for money, as well as the deliberation and vision behind the program. The Panel also provided recommendations for improving the quality of the program. The foremost recommendation was related to improving the scope and depth of doctoral dissertations. Apart from this, they recommended assigning co-mentors. The other remarks were not aimed at the functioning of the program itself but rather referred to institutional reforms, such as revising the process of appointing committee members for dissertation defenses, adopting quality indicators, and revising the structure of teaching and mentorship. Changes to the bylaws in 2018, which followed the

re-accreditation, unfortunately, did not resolve a single critical remark of the re-accreditation Panel. These included issues with the quality of



The award ceremony at which TRIBE received a high-quality label

We suggested that a significant improvement in the quality and number of publications on which dissertations are based requires **raising the bar regarding our expectations** of students.

doctoral dissertations, the absence of regulations on naming mentors and supervisors, a lack of clear regulations that would allow for writing dissertations in English without any exceptions, and the absence of a reform of the Committee for Doctoral Dissertations.

Based on the comments received, each doctoral program was expected to prepare an action plan that would address the received criticism. We, at TRIBE, devoted particular attention to resolving the issue of the quality of doctoral dissertations. We argued with our colleagues that the breath and depth of dissertations was the result of low criteria defined by the bylaws. In line with those criteria, students and their mentors were selecting minimum requirements for a doctorate, resulting in a low number of publications based on defended dissertations and publishing those articles in Journal Impact Factor. We suggested that a significant improvement in the quality and number of publications on which dissertations are based requires raising the bar regarding our expectations of students.

We hoped in vain that the new bylaws would set more stringent criteria and state that a dissertation must be based on at least two articles, on both of which the candidate would be listed as the first author. However, since the School did not change the bylaws, we decided to implement those changes for TRIBE students to influence the quality of doctorates coming out of our program. At TRIBE's Council, we changed the TRIBE program's study rules. We decided to start requiring candidates to apply for enrollment with at least two related research protocols



The "high quality" label awarded to the

TRIBE program

that can yield at least two published articles where the candidate would be listed as the first author.

We implemented this decision even though it was a rather risky move. Namely, in doing so, we introduced different criteria for obtaining a doctorate within a single institution.



The TRIBE council: Sapunar Damir, Puljak Livia and Grković Ivica



The award ceremony at which TRIBE received a high-guality label

According to these criteria. TRIBE's students would be subject to significantly stricter requirements for obtaining a doctorate compared to those of the other doctoral programs for which the minimum requirements, as set by the bylaws, would still apply. We implemented this change for students that would be enrolling in TRIBE from the academic year 2018/2019 onward. In order to assess the effect of this decision, we continuously analyze the scientometric indicators related to articles published from doctoral theses of TRIBE students. To see the results of such an intervention in doctoral programs, we had to wait at least three years after the first students had been enrolled in line with the new rules since the doctoral program lasts three years. With regard to the guality of dissertations, the international re-accreditation committee also pointed out

the inability of international assessment of doctoral dissertations written in the Croatian language, which is unfamiliar to them. The TRIBE program's Council decided, in accordance with this remark, to suggest to candidates that they write their research plans and to ask for permission from the Committee for Doctoral Dissertations to write their doctoral dissertations in English. We suggest that the new bylaws enable all candidates to write and defend their dissertation in English, without exception.

At the institutional level, evaluations of doctoral programs are performed within the School and include a report which, according to the bylaws, the program's Council must deliver annually to the Doctoral School Council. TRIBE delivers all of its Council's reports and minutes to the Office for Postgraduate Studies. The analysis of the teaching done at the postgraduate level, carried out by the Quality Improvement Committee of the School of Medicine in Split, is identical to the one done at the graduate level. It is the duty of the Office for Postgraduate Studies to keep statistics on students, the exams that they have passed, and reports on their financial obligations. As part of its regular analysis of scientific output, the Research Support Department would have to annually publish the results of mentors' work, the laboratories' work, and that of the principal investigators of specific projects on its website. Unfortunately, evaluations at the institutional level are not carried out regularly or systematically. So there is a large gap in the data that was supposed to be collected over the years.

Continuous **monitoring and analysis** of scientific output at the level of the TRIBE program

We believe that the best way to improve the program's quality is continuously and comprehensively tracking the success of our students. We are especially proud of the extensive scientific analysis of all the elements of our doctoral education, which we have been conducting since the very start of the TRIBE program. The data collected relates to the number of students dropping out, the number of dissertations defended, the time from enrollment to dissertation defense, the number of articles on which doctorates are based, and the Journal Impact Factor of the journals in which these articles were published. The data that demonstrates our students' improvement is available at TRIBE's website and is regularly updated. Another form of analysis relates to presenting the results of our approach to doctoral education in scientific journals and at conferences. Our "extreme transparency" approach to publishing our

students' results and their success rate as well as public comparisons to other programs 4 has been criticized several times at the School. Thus, we were very pleased to read an article published in the Educational sciences 5 journal in 2020, written by our colleagues from the doctoral program Biology of Neoplasms, which gives a detailed analysis of their students' results. Only unsuccessful people should be afraid of disclosing their

4 Vidak M, Tokalić R, Marušić M, Puljak L, Sapunar D. Improving completion rates of students in biomedical PhD programs: an interventional study. BMC Med Educ. 2017;17(1):144.

5 Benzon B, Vukojević K, Filipović N, Tomić S, Glavina Durdov M. Factors that determine completion rates of biomedical students in a PhD programme. Educ Sci 2020;10(11):336. results. We, therefore, support any initiative to speak publicly about the results of doctoral programs in Croatia.

Feedback from doctoral students

All activities at the TRIBE program are accompanied by questionnaires that are carried out through our SurveyMonkey account (Survey Monkey, Palo Alto, USA). We currently have surveys for all our courses.

Continuous improvement

Organization of the TRIBE program, as well as the curriculum, are continuously revised over the years based on our analysis and student feedback, in line with the foundational principles of quality management. All changes are documented in the TRIBE Council's minutes so we can have a clear trail and thus perform analyses of the associations between the changes made and student success rates.

The percentage of obtained doctorates at the TRIBE program by academic year

| AY | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Enrolled | 13 | 10 | 12 | 11 | 12 | 10 | 11 | 17 | 15 |
| Graduated | 10 | 6 | 8 | 7 | 9 | 6 | 9 | 6 | 5 |
| % | 77 | 60 | 67 | 64 | 75 | 60 | 82 | 35 | 33 |

The number of doctorates obtained at the program A common way of evaluating the success of doctoral education is by tracking the number of defended theses and time to the dissertation defense. Unfortunately, this information is rarely published by institutions or at the national level, which makes finding this information, particularly for European doctoral programs, difficult or impossible. Doctoral programs typically last three to four years in most countries, but in reality, doctoral students need a lot more time to obtain their doctorate. The most precise data on the number of obtained doctorates in the US and Canada is available through The Council of Graduate

Schools (CGS) PhD Completion Project. According to the project's report published in 2008, only 57% of students obtain their doctorate within 10 years. 6

6 https://cgsnet.org/data-insights/diversity-equity-inclusiveness/degree-completion/ph-d-completion-project/ (Accessed 22 June 2022.) By the end of 2021, students enrolled in TRIBE defended 65 doctoral dissertations. If we do not count students who have still been taking courses over the past three academic years (as the postgraduate program lasts three years), from 2010/2011 to 2019/2020, TRIBE has enrolled 123 students of which twelve have been unenrolled. So, of the students who did not unenroll, not counting the past three academic years, 65 out of 111 students that were enrolled in the TRIBE program (i.e., 60%) successfully graduated, which we are very proud of. This data is comparable to that of doctoral programs in the US and Canada.

Based on the bylaws, there are three doctoral dissertation models at the University of Split School of Medicine:

a) dissertations based on primary research i.e., classical monograph dissertations,
b) the Scandinavian or multi-article

dissertation model, and

- c) dissertations based on a
- systematic review.

Thus far, there have been two (3%)

doctorates based on systematic reviews and 11 (17%) of dissertations based on the Scandinavian model defended within the TRIBE program. Unfortunately, the number of doctorates based on systematic reviews within all of the doctoral programs at the School is still low due to the negative attitudes of the relevant School bodies towards such research. Namely, their opinion was that systematic reviews do not bear enough "weight" to be appropriate research for doctoral dissertations. During one period of the School's history, the bylaws permitted students to write their dissertations solely based on systematic reviews, but this was subsequently changed because of the negative attitude towards this type of research. According to the current bylaws, students who choose to conduct a systematic review within their dissertation must publish an article based on primary research in a journal as a prerequisite for submitting their dissertation topic, which is why candidates are likely to avoid such research. To elaborate, in the case of other types of research, no conditions are imposed on candidates in terms of which study needs

OTHATIO

to be published first as a prerequisite to submitting their dissertation topic. Despite numerous advantages of systematic reviews as a part of doctoral education, negative attitudes towards this type of research remains an obstacle.

In order to analyze the attitudes of the directors of other European doctoral programs on systematic reviews as a part or the entirety of doctoral dissertations, we conducted a study within the network of doctoral programs that are members of ORPHEUS the Organization for PhD Education in Biomedicine and Health Science in the European System. We published the results of our analysis as a research article. **7**

Time to degree

The average time from enrollment to obtaining a doctorate at TRIBE is four years and three months $(51\pm23 \text{ months})$.

Scientific output of TRIBE's students

Since we enrolled our first students in May of 2021 up to the end of 2021, students at the TRIBE program published 144 articles from the 65 defended doctoral dissertations. The average number of published articles per doctoral dissertation was 2.2.

However, it is not easy to evaluate the quality of these publications. The Journal Impact Factor and the number of citations are not reliable criteria for assessing the quality of a particular article, especially since some of them were published only recently. Still, the cumulative number of citations keeps growing and it is clear that the program's scientific output significantly contributes to the School's scientific reputation. Up to the end of 2021, the average Journal Impact Factor of the journals in which TRIBE students published articles that were based on their defended doctoral dissertations was 3.5 (3.5 ± 3.1).

7 Puljak L, Sapunar D. Acceptance of a systematic review as a thesis: survey of biomedical doctoral programs in Europe. Syst Rev. 2017;12;6(1):253.

Monitoring completed doctorates

For evaluating the success rate of a doctoral program, it is important to monitor doctoral candidates' careers and their scientific output following their doctorate. However, research on this subject is extremely rare. In 2015, representatives of the TRIBE program got involved in the Career Tracking Survey 2017 project. The project was led by the European Science Foundation — Science Connect, and the role of TRIBE's representatives was to collect data on the scientific development of all doctoral students at the University of Split.

Changing mentors and resolving possible issues between mentors and doctoral students

At TRIBE, we have witnessed serious misunderstandings between students and mentors on several occasions. To resolve them, we developed a system that includes organizing a meeting between the program directors, the student, and the mentor. At these meetings, the directors play the role of mediators in the dispute between the student and mentor. Based on these experiences, we have concluded that it is necessary for the student and suggested mentor to sign an agreement about mutual expectations upon the student's enrollment. This agreement represents a show of good faith for resolving disputes and an obligation to inform the program directors about them. In order to further protect students, we have set up a page on our program's website with a form that serves as a line



A vital part of the learning process is coffee and socializing at the nearby coffee shop

of confidential communication. The confidential communication form allows students to report any/all forms of code-of-conduct violations committed either by mentors or professors of the program.

Occasionally, despite the signed agreement, it proved impossible to resolve problems between mentors and doctoral students and keep both parties satisfied. In these situations, we helped the student to find a new mentor and define a new dissertation topic.

A small number of students dropping out of the Program

Of the 147 students enrolled in total, 15 students (10%) have dropped out in the first 11 generations (from the academic year 2010/2011 to 2021/2022). A low percentage of unenrolled students is generally a result of our insistence on clearly defined research topics when enrolling in the Program. Reasons for unenrolling vary, but, in most circumstances, their nature is private (pregnancy, childcare, relocation, a change of employment, changes in status within an organization, etc.). A smaller number of students were unenrolled because they failed to move forward with their research.

Mentors supervising students

One of the remarks of the re-accreditation committee was related to naming only one person who would be responsible for the doctoral candidate, which is not in line with the current standards for doctoral education. Resolving this problem falls under the authority of the School's management as the question of mentorship can be systemically defined only by the bylaws. Until this problem is resolved and the directives of the bylaws are aligned with the recommendations of the re-accreditation committee, TRIBE's Council has addressed the problem of additional mentorship by defining a mentor and supervisor in our internal study rules. Such a directive applies only to students of the TRIBE program and does not bear the weight of a decision adopted by the School Council. Since the accreditation,



A holiday card for TRIBE students

and according to this directive, all students have both a mentor and a supervisor, as well as "guardian angels" — second- or third-year TRIBE students who are assigned to first-year students in order to help them adjust to the program.

Despite this decision on the level of TRIBE, dissertation mentors still have to be formally proposed to the Committee for Doctoral Dissertations and appointed at the School Council. The terms "mentor" and "supervisor", as we use them, differ from typical EU terminology in which the term "supervisor" is used to denote what we call a mentor. We have no intention of changing the established terminology. So, the mentor will still signify a key person in the education of postgraduate students, while the supervisor is someone who will additionally oversee the student's progress. For example, the head of a laboratory or department where the research is being carried out may have the role of supervisor.

Foreign students

Ever since the TRIBE program was set in motion, our goal has been to have an international program where foreign nationals could also obtain their doctorates. In 2016, Lara Jane Maxwell obtained her doctorate at the TRIBE program, under the mentorship of professor Peter Tugwell. Thus,





Lara Jane Maxwell, the first foreign student to defend her doctoral dissertation at the TRIBE program

she became the first foreign student who defended her doctoral dissertation at the TRIBE program. This dissertation, along with some that followed, is a result of the collaboration with the Canadian Cochrane Centre that professors Ana and Matko Marušić brought about. Since then, 10 more foreign students have enrolled in TRIBE of which seven obtained their doctorates by of the end of 2021. In the academic year 2016/2017, Melissa Sharp and Ketevan Glonti enrolled in TRIBE within the European project MiRoR, financed by the Marie Skłodowska-Curie Actions program for doctoral education. These two students also enrolled in doctoral programs at the Paris Descartes University, alongside TRIBE, and thus became the first students to obtain a dual doctorate at TRIBE.

Mentorship awards

Awards for doctoral dissertation mentors at the School of Medicine in Split were introduced in 2009 and, since then, the best mentors have been awarded only twice. In October of 2021, we developed our own internal system for rewarding mentors at the TRIBE program. As of the academic year 2021/2022, TRIBE has introduced a system for rewarding mentors such that, at the start of every academic year, we reward three mentors whose students obtained their doctorates in the previous calendar year. The sum of the Journal Impact Factor of all the articles published from the doctoral dissertation is calculated as the measure of success. For the award, the newest available Journal Impact Factor is considered.



Awards for the best mentor and best student

IT support for organizing lectures

Postgraduate programs are executed based on an annual teaching schedule, which is published before lectures start for the current academic year and is available to the public via the EduPlan/EX web app and the websites of the respective postgraduate programs. EduPlan/EX is part of a project for creating schedules, booking auditoriums, and automating teaching processes monitoring. **8** EduPlan/EX and the Higher Education Institutions Information System (hr. Informacijski sustav visokih učilišta — ISVU) complement each other extremely well and entirely satisfy all of the requirements of organizing an educational program.

We believe distance learning to be extremely important for implementing a program well. This type of learning enables the participation of students from other cities and countries, and students who need to travel for work. Precisely because this type of learning was properly set up before, we had no problems with our courses during the COVID-19 pandemic. Apart from the EduPlan/Ex and ISVU systems, TRIBE also

uses Moodle's services Merlin and Loomen, both of them being systems for e-learning. It is possible to integrate Merlin with ISVU, which enables opening new courses from ISVU within Merlin and adding professors as well as students. Students sign into all e-learning services using their electronic identity from the AAI@EduHr system.

To make lectures more widely accessible, we use Adobe Connect Pro, Microsoft Teams, and Zoom, which allows us to deliver online lectures. Starting with the academic year 2021/2022, we will be applying an

online system for storing exam questions as well as writing and distributing exams, designed in collaboration with Lama IT company.

Ensuring academic integrity

Academic integrity at the TRIBE program is ensured on two levels. The first relates to students' formal education at the TRIBE program. During their first year at the program, students attend the "Ethics in research" module within the Transferable skills course. Prof. Elisabeth Wager, who, from 2009 to 2012, was the president of COPE (the Committee on Publication Ethics) and who was a member of the Ethics Committee for the British Medical Journal as well as the World Association of Medical Editors, took part in this course as a visiting lecturer for many years. By brining in such a high-profile and reputable researcher, we created excellent preconditions for the highest level of quality for our ethics courses. Lectures for this course are currently held by Prof. Ana Marušić, the research integrity advisor for the Doctoral School. Apart from formal education in the field of research ethics, Prof. Ana Marušić also organizes numerous extracurricular activities in the area of research integrity, such as summer schools (e.g., the Summer School on Responsible Research) and prepares educational material through the projects that she leads, for example The Embassy of Good Science.

⁸ Sapunar D, Grković I, Lukšić D, Marušić M. Management of teaching processes using the Share point platform: A case study from the University of Split School of Medicine. Acta Med Acad. 2016;45(1):34-8.

The second step in ensuring academic integrity is conducted at the institutional level and pertains to procedures related to academic integrity. Legal matters at the School are regulated by legal documents as well as the University's and School's official documents, namely:

- The Code of Ethics of the Committee for Ethics in Science and Higher Education
- The Code of Ethics of the University of Split
- The Code of Ethics of the University of Split School of Medicine
- The Bylaws on Postgraduate Studies and the Bylaws on Obtaining a Doctorate
- ALLEA (European Federation of Academies of Sciences and Humanities) European Code of Conduct for Research Integrity
- · ALLEA Code translated into Croatian.

Apart from legal regulations that exist at the School, Prof. Ana Marušić defined the protocol for the School's staff that ensures researchers get the help they need related to ethics. Thus, all researchers, including postgraduate students, can get the information they need on publishing and disseminating their work, authorship, conflict of interest, as





Elisabeth Wager with TRIBE students and teachers

well as managing data and samples all in one place. The advisor also provides advice on questionable research procedures and procedures in which ethical principles are violated. For the doctoral program, the presence of a person to whom students can turn with questions related to academic integrity is of extreme importance, although this role is only advisory. Nevertheless, executive problems are still resolved by higher authorities, as defined by the Code of Ethics. In so doing, it is important that part of the process is conducted via an anonymous online form for reporting irregularities.

At the TRIBE program, we believe that defining the legal framework and procedures for checking plagiarism are especially important elements of academic integrity.



Ana Marušić — the research integrity advisor

58 TRIBE

Software support for checking plagiarism was only recently resolved at the national level in Croatia. The national University Computing Center (Srce) conducted a comparative analysis of programs used for detecting plagiarism and suggested the Turnitin and PlagScan software as serious candidates for use in science and higher education. Those software packages were recently purchased and made available to the entire academic community. It was simultaneously necessary to establish rules that would ensure the organizational preconditions for using the software for detecting plagiarism. Unfortunately, the suggestion of TRIBE directors to include obligatory plagiarism testing for doctoral dissertations was rejected several times.

By brining in such a high-profile and reputable researcher, we created excellent preconditions for the highest level of quality for our ethics courses.

Public availability of doctoral dissertations at TRIBE

The obligation to publicly publish one's doctoral dissertation after its defense is regulated by the contract that students sign when enrolling in the TRIBE program. In exceptional cases, publicly publishing the dissertation can be postponed by a year if the student has not published all the results from their dissertation in a journal at the time of their dissertation defense. We are proud to have the full manuscripts of all the defended dissertations at the TRIBE program to date publicly available at our website. We believe that publishing doctoral dissertations on our program's website is an important contribution to the fight against plagiarism. Each student that obtains their doctorate gets their own web page containing the defense date, mentor's name, dissertation title, a list of articles on which the dissertation is based, and the full text of the dissertation. An additional resource for storing dissertations is the repository of the School library and, in agreement with them, we should start using Srce's national repository — Dabar — fairly soon.

Availability of data on which dissertations are based

The contract that students sign when enrolling contains an article that obliges them to store the data on which their dissertations are based in a publicly available repository or to publish it as supplementary material to their dissertations in electronically readable formats (e.g., spreadsheets rather than PDF documents) on a portable storage medium (CD) that is an integral part of the dissertation. In exceptional cases, a student can ask the TRIBE Council to be exempted from this rule, providing an explanation.

Data repositories

The School has not yet worked out a system or guidelines for managing research data. We are aware of the fact that open access to research data is one of the basic principles of open science and contributes to research quality as well as faster application and better usability of research results, and considering that institutions that finance scientific research projects are requesting this ever more frequently. Thus, we decided to strongly encourage students to accept FAIR and open-science principles.

We are proud to have the full manuscripts of all the defended dissertations at the TRIBE program to date publicly **available at our website**.

With this goal in mind, one of the directors of the program (DS) took part in the work of Dabar's Coordination Committee's Working group for research data, which was supposed to define the preconditions for consistent storage of research data within repositories and define the storing procedures, formats, sizes, documentation, meta data, security information, and the terms of reuse and the availability of the data itself. Apart from including topics on open science in the teaching program, in June of 2019, in collaboration with Srce and the Center for Research Information (hr. Centar za znanstvene informacije) of the Ruđer Bošković Institute, we organized a workshop titled "Publishing research data in the Dabar repository system", which was supposed to further familiarize the attendees with the benefits of quality data management. With the aim of scientifically analyzing the problem of publishing research data, we also authored

two articles on this topic in scientific journals within the doctoral dissertation of Dr. Mirko Gabelica. 9, 10

Diploma supplement

At the meeting of the Doctoral School Council on January 27, 2020, the directors of the TRIBE program suggested that a diploma supplement be issued for students that obtain their doctorates. A diploma supplement contains information based on which employers and educational institutions can gain better insight into a candidate's qualifications. For example, it contains information on the national educational system, the contents of a program, obtained ECTS points, grades, and learned subject matter. As this motion was accepted. as of that date. TRIBE issued diploma supplements to students who requested them. What we find to be important is that the diploma supplement also contains information on a candidate's doctoral dissertation and the articles on which it is based as well as Latin honors. if the student was awarded them.

 Gabelica M, Sapunar D, Marusic M, Puljak L. The ideal repository for hosting data from clinical trials: blueprint using business process management. F1000Research 2021;10:23.
 Gabelica M, Cavar J, Puljak L. Authors of trials from high-ranking anesthesiology journals were not willing to share raw data. Journal of Clinical Epidemiology. 2019;109:111-116.

Latin honors

Latin honors are Latin phrases that aim to describe the different levels of academic distinctions. The system that we have been applying since 2020 at the TRIBE program has three honors: with highest praise, with great praise, and with praise.

1. Highest praise, or **summa cum laude**, is awarded to students who satisfy the following conditions:

- · a grade point average of 5.0 at TRIBE,
- a doctoral dissertation defended within 48 months of enrolling in the program,
- a dissertation based on three or more articles.

2. Great praise, or **magna cum laude**, is awarded to students who satisfy the following conditions:

- · a grade point average of 4.9 at TRIBE,
- a doctoral dissertation defended within 54 months of enrolling in the program,
- $\cdot\,$ a dissertation based on three or more articles.

3. Praise, or cum laude, is awarded to students who satisfy the following conditions:

- · a grade point average of 4.7 at TRIBE,
- a doctoral dissertation defended within 60 months of enrolling in the program,
- \cdot a dissertation based on three or more articles.

The honor is presented in the form of a plaque. In case several students meet the criteria, the honor is awarded to all of them.

Contact with students and data access

The TRIBE website is a central hub for information about the program. Apart from the institutional website on which formal notices about the TRIBE program are published, we use social media as an additional informational channel. TRIBE has a Facebook group where we publish information about the program in a less formal way. The TRIBE Facebook group currently has 177 members, including current and previous students as well as staff. The aim of the group is to share formal and informal information that is important for students. We post information about public discussions taking place on the topic of doctoral dissertations or dissertation defenses by way of which we encourage students to attend these events. We also post information about educational and funding opportunities for doctoral students.

TRIBE's YouTube channel currently hosts 45 videos organized into several lists. In most cases, these videos were taken at specific courses organized within the TRIBE program. The point of publishing



material is ensuring that lectures are accessible. Some videos are accessible only via private links, which we send to our students by e-mail. Those videos are kept private based on the lecturer's request, for example because they deal with sensitive topics such as those related to working with laboratory animals. The total number of views on our YouTube channel, as of February 2022, was 6766.

Christmas party





The visual identity and promotional material of the TRIBE program

.



TRIBE's Facebook group and YouTube channel

Public relations and promoting the program

As part of our promotional activity, we have worked on the visual identity of the program from its inception. A fully developed visual identity serves to ensure the unique appearance of all our documents and all the activities related to the TRIBE program. TRIBE T-shirts, tote bags, and notebooks are gifted to visiting lecturers and students after they graduate.

At TRIBE, we believe public relations to be extremely important, which is why we have devoted one section of our website to media reviews of the program, which we have accrued a significant number of over the past 10 years.

Courses and lectures

As part of the TRIBE doctoral program, we regularly organize additional courses and lectures for students beyond those planned within mandatory and elective courses. Within them, we have hosted reputable international scientists such as John Ioannidis, David Moher, and others. A large number of these lectures are recorded and uploaded to our YouTube channel. Our students' keen interest in such lectures has prompted us to organize a new activity at the program, which we've named Excellence in Research. As part of this series of lectures, successful scientists will hold motivational lectures for TRIBE's doctoral students. The lecture will include not only the scientific aspects of a person's work, but, for a few hours, the scientists will also speak about themselves, their scientific path, their most significant research findings, and the main obstacles that they encountered in their research as well as provide doctoral students with advice on achieving success and excellence in science.

This will count towards the informal part of the curriculum. Over the years, at TRIBE, we have had many elective courses in the program's second year, which we realized were not necessarily interesting or useful for many students. This is why we opted to substitute a small part of these elective courses with informal lectures titled Excellence in Science and within which we plan to engage exceptionally successful scientists. Each of them will be invited to structure their lecture for students as follows:

- their education,
- their scientific path (how they got into science, what attracted them to it, what research they are doing, what they believe to be their main achievements, what their most significant articles are),

- the main obstacles in their scientific career and how they overcame/are overcoming them,
- · who their mentors were, who motivates them and why,
- what they would recommend to doctoral students, and what their recipe for success in science is.

The idea behind these informal lectures at TRIBE is to pass somebody's scientific spark onto the students and to inspire them; to show them that putting in the work and effort leads to success.

The Laboratory animal science course

In the early days of the School, a large number of our scientists underwent their postdoctoral training at international laboratories with the help of Prof. Matko Marušić. Most of these laboratories worked with animals. Those researchers continued working with laboratory animals when they returned to Split. While building the laboratory in the new building of the School, we insisted that the technology and equipment should be suitable for that type of research and,





A lecture by Dr. John loannidis from Stanford University

so, our laboratories were built and equipped accordingly. At the time, most of those who founded their own laboratories naively hoped that Split would become famous precisely for this type of research. However, such research requires strong institutional support and outstanding support from those that manage the laboratory animals facility. Unfortunately, we never received such support, so the number of laboratories that still work with animals is dwindling, which is clearly demonstrated by the ever-lower number of animals used at the School. In addition to this, changes happening in the EU and ever-tighter regulations make working with laboratory animals in institutions that have not developed quality mechanisms for supporting this type of work more difficult. Therefore, it is easy to expect that



Laboratory animal science course attendees

the number of groups working with laboratory animals will keep reducing. For a small scientific community such as ours, this battle has been lost. Still, in an attempt to postpone the inevitable and help researchers who still have enough enthusiasm to get to grips with working with laboratory animals, we decided to organize the Laboratory animal science course.

After Croatia was accepted into the EU, new rules were instated, according to which those working with laboratory animals had to have adequate training in the biology of laboratory animals, experimental methods, and other relevant topics required to behave responsibly towards animals used in research. Those involved in research that includes laboratory animals must be trained according to the laws and bylaws that are currently in effect. In Europe, the standards for this training are issued by the Federation for European Laboratory Animal Science Associations (FELASA). In order to be found competent to work with animals, a scientist must have training in natural and biomedical





Laboratory animal science course attendees

sciences and have passed the basic Laboratory Animal Science for Scientists Course (category C in accordance with FELASA). At the very start, only three institutions in Croatia held these courses, all of them located in Zagreb. Therefore, we initiated the Laboratory animal science course at TRIBE. We pride ourselves on achieving many things throughout our scientific careers, and overcoming many obstacles in the process, but obtaining the permit to organize this course was a harrowing experience. The procedure was excruciatingly slow, without defined deadlines, and with incomplete and imprecise instructions for course preparation. Eventually, our course was approved and accredited at the start of 2015. Since its accreditation today, we have organized four courses.

Sixty-four students have passed the course so far, meaning that we have ensured all of those interested in working with laboratory animals the option to do so. We would expect that such an initiative would be wholeheartedly supported, but, unfortunately, our experience has proved otherwise. We have had serious problems with the course on several occasions around charging registration fees even though it was registered as a course for continuing medical education.

The course How to write a systematic literature review: basics of methodology and practical step

A course on the basics of the methodology of writing a systematic literature review was missing in the region, so TRIBE organized it for the first time in 2018. The course includes performing various steps of a systematic review. Those who attend it have the opportunity, through practical exercises and under the supervision of a teacher, to go through the key elements of the





Attendees of the course How to write a systematic literature review

methodology behind writing a systematic literature review. This is a two-day course with 20 hours of training. There is a registration fee, though the course is free for TRIBE students. The course was adopted as part of the program of continuing medical education at the School of Medicine in Split. It was also registered as a continuing medical education course with the Croatian Medical Chamber, which assigns credits to physicians that finish the course. Unlike the Laboratory animal science course, we had no problems organizing or implementing this course whatsoever. People from all parts of Croatia and abroad have attended the course.
-> Problems with leading the program

During our first ten years we faced a

During our first ten years, we faced a lot of criticism, resistance, as well as problems and we invested way too much time trying to solve them. It sometimes seems to us as though we have finally been able to resolve some of these problems, but then the same problem emerges again after some time. We can divide these problems into two key areas: problems with doctoral dissertation topics and organizational problems. TRIBE

70

Problems with doctoral dissertation topics

The problems with doctoral dissertation topics include the resistance towards accepting systematic literature reviews, an aversion towards questionnaire-based studies, research that is not deemed to be "real science", and research that some consider is not biomedicine. All of these problems boil down to the severe difficulty of accepting the change in contemporary science that is moving away from the romanticized vision of a scientist who, alone in the laboratory, gathers data on laboratory animals or hospital patients and arrives at spectacular discoveries.

The problem of systematic literature reviews

Systematic literature reviews are studies in which research evidence is synthesized in a systematic way using a rigorous methodology. To conduct a systematic review, one needs to define a research question and a detailed protocol. The systematic review steps include: searching a series of databases, screening retrieved records, selecting research that answers the question, extracting data from these studies, assessing the guality of the research involved, producing new analyses based on the found data (meta-analyses, if possible), and providing conclusions for research and practice based on included studies. Systematic reviews are considered the highest level of evidence in medicine. By establishing the Croatian branch of the Cochrane organization in 2008, more options became available at the School of Medicine in Split for promoting

science-based medicine and medicine based on systematic reviews in Croatia and the region. Shortly after the establishment of the Croatian Cochrane branch, the Committee for Doctoral Dissertations received a motion from one of us (LP) to allow doctoral students to conduct systematic reviews within their doctoral dissertations. This idea was accepted and, in 2009, included in the Bylaws, which regulate the process of obtaining a doctorate.

In the current environment where budgeting for research is scarce, creating systematic literature reviews offers the opportunity to conduct research that does not require complex infrastructure and large funding. Yet, if conducted well, systematic reviews can be published in top-ranking journals. **11** For example, the Journal Impact Factor of the Cochrane Database of Systematic Reviews (CDSR) for 2020 was 9.266. Systematic reviews can also be published outside of Cochrane in many journals with both higher and lower Journal Impact Factor compared to CDSR.

However, over all these years, we have had continuing problems with scientific justice warriors trying to remove or marginalize systematic literature reviews as a valid option for obtaining a doctorate. The same issue has surfaced at other institutions in Croatia. For example, when we, after the establishment of the Croatian Cochrane branch, promoted systematic literature reviews as a model for doctoral dissertations at Croatian medical faculties, the former vice-dean of one of the medical schools responded: "A systematic literature review is not science and, at our school, that will never be accepted as a doctoral dissertation." Over time, all of these schools have come to accept the idea that systematic reviews and meta-analyses can be the type of research that can be done within the scope of a doctoral dissertation. For example, at the School of Medicine of the University of Rijeka, acceptance of a systematic review as a study design that can be used in a doctoral dissertations was

used in a doctoral dissertations was encouraged by Prof. Davor Štimac, who is the author and editor of the Cochrane hepatobiliary group.

11 Sambunjak D, Puljak L. Cochrane systematic review as a PhD thesis: an alternative with numerous advantages. Biochemia Medica 2010; 20(3):319-26. The humiliating and discriminatory treatment of authors wishing to conduct systematic reviews within their doctoral dissertations has been supported over all these years by a number of arguments that are, from our perspective, difficult to understand and for which we have provided explanations countless times, so we have no problem repeating them here.

1. "A systematic literature review cannot be a doctoral dissertation because the key segments of a systematic review must be conducted by two authors in collaboration, which means it is not an independent research article."

Today, in biomedicine, the number of research studies conducted by a single person is negligible. Emphasis is placed on teamwork and interdisciplinarity. When it comes to a doctoral dissertation, by definition, a student has a mentor, so scientific research done for the purpose of a doctoral dissertation will be the result of the work of at least two people — the student and the mentor. Therefore, no doctorate will be the independent work of the doctoral student. Some doctoral dissertations defended at the School of Medicine in Split were based on research articles co-authored by more than 20 individuals. It remains unclear why critics find it acceptable for doctoral dissertations to have more than 20 co-authors in other types of research. whereas co-authors are not welcome when it comes to systematic literature reviews.

2. "Systematic reviews should be written by someone with plenty of clinical practice rather than a beginner/ doctoral student."

"In my experience" is a phrase that usually introduces a statement of rank, prejudice or bias. The information that follows it cannot be checked, nor has it been submitted to any analysis other than some vague tally in the speaker's memory. — Crichton M. 12 We were told many times that doctoral students could not conduct systematic reviews because they do not have enough clinical experience. To conduct a systematic literature review, it is highly relevant that at least one of the co-authors possesses expertise with clinical content and that they can be a mentor. The crucial aspect of conducting a systematic literature review is knowledge of the scientific methodology on evidence synthesis. Therefore, there is no need for all the authors of a systematic review to have "extensive clinical experience" in order for them to be able to participate in such research. Such criticism of any research leads to the trap of non-scientific discussions where we end up not talking about the important issues, such as the originality of the idea, the clarity of the hypothesis, and methodological quality. Instead, the opponents talk about aspects that are not measurable, such as someone's experience. If we assume that the concept of "experience" was used here instead of the concept of "knowledge", then such an observation could be applied to all research. Many doctoral students have vet to acquire deeper knowledge of the subject they are researching; learning is at the core of writing a doctoral dissertation

"In my experience" is a phrase that usually introduces a statement of rank, prejudice or bias. The information that follows it cannot be checked, nor has it been submitted to any analysis other than some vague tally in the speaker's memory. — Crichton M.

> Unlike "experience", knowledge is something that can easily be verified. It is the mentor's responsibility to educate the doctoral student. So, the more important question is whether the mentor has sufficient knowledge to support studies conducted within a dissertation based on a systematic literature

12 Crichton M. In my clinical experience. N Engl J Med 1971;285:1491. 80 TRIBE

(...) it is necessary to judge each systematic review individually, and any application for writing a doctoral dissertation in the form of a systematic review should only be assessed **by scientists experienced** in conducting such research.

review and not what the student's previous knowledge and "experience" is.

3. "A systematic literature review can be written in a few afternoons."

Such a snide remark can only mean one thing — that someone thinks that systematic reviews do not have any scientific value because they can be done very quickly. As authors of multiple systematic literature reviews, we, unfortunately, have to report that we were not able to conduct any of them in a few afternoons, and we do not consider ourselves incompetent. Not all systematic literature reviews are equally demanding, and not all teams of authors conducting them are equally dedicated. So it is impossible to generalize how long it takes to write a systematic literature review. Nevertheless, we can tell you for sure that a few afternoons is never enough to do this kind of research. Just writing a systematic review protocol sometimes lasts several months.

As far as quality is concerned, it is well documented in methodological studies that all published systematic reviews are not of equal quality and that some do not contain all the methodology one might expect from a systematic review. Therefore, it is necessary to judge each systematic review individually, and any application for writing a doctoral dissertation in the form of a systematic review should only be assessed by scientists experienced in conducting such research. Unfortunately, our experience has shown that such superficial and generic assessments of systematic reviews are made by people who do not have methodological knowledge of systematic reviews but only a vague and distorted view of what such work involves.

Furthermore, any general division of research into appropriate or inappropriate depending on the time needed to finish it is pure discrimination. In all research fields, some studies take a long time. some can be completed faster, and a number of factors affect the time needed to conduct a study. Scientists with plenty of research experience, who have mentored many students, know very well that it is not possible to predict the duration of any individual study and that, sometimes, even the simplest of studies requires great and lasting effort. The amount of time it takes to complete a study depends on a research protocol, the researchers' diligence, the quality of the mentors who can make the most complex of experiments easier, on many external circumstances, but also sometimes on luck. A lack of knowledge about different study designs can lead to a misconception about how long it takes to conduct a study and falling into the trap of some types of research a priori being declared "too easy".

4. "There was an onslaught of doctoral dissertations based on bad systematic reviews at the School." When it was mentioned at the School Council that there is an onslaught of doctoral dissertations based on bad systematic reviews, one would expect that we have had many doctoral dissertations based on systematic reviews, and bad ones at that. However, these claims were not substantiated by any evidence. An "onslaught" would probably mean that many dissertations were based on systematic reviews, but this is completely incorrect. Not many doctoral students choose to do this kind of research for a number of reasons. Firstly, there are not many mentors who know how to do systematic reviews to such an extent that they can mentor this type of research. Secondly, systematic reviews are difficult to conduct; they require the student to gain extensive methodological knowledge, and some students are deterred by this. And the claim that some students have obtained their doctorates on "bad" systematic reviews could only be confirmed if someone formally assessed 82

the methodological quality of these systematic reviews, for which valid tools do exist. Unfortunately, we have yet to see such analyses of doctoral dissertations based on systematic reviews.

5. "Systematic reviews are cheap research."

In the "believe it or not" category, we are including a comment according to which systematic reviews should not be allowed in dissertations because they are — cheap. Some colleagues have complained that their research is expensive, that they have to work hard to obtain grants to support their doctoral students, and they don't understand why it should be possible to obtain a doctorate based on a systematic review, which is cheap or at least not the expensive type of research. Such an argument is just an additional discriminatory comment aimed at different types of research, this time based on money. Many types of research can be low-budget, but that does not make them worthless. In the end, the question is what counts towards the cost of conducting research. If someone's work also counts towards the price of research, then all types of research are expensive because they require numerous work hours

6. "Alongside mentors of systematic reviews, co-mentors should also be assigned if the mentor and student are not experts in the area of research."

It was suggested at the School that, if a mentor of a doctoral dissertation based on a systematic review is not an expert clinician, such an expert should be assigned the role of a co-mentor.

It remains unclear how someone is deemed to be an "expert" in an area of research and how it would be decided whether a mentor of a systematic review dissertation should be accompanied by a co-mentor. Such a co-mentor should therefore meet two conditions: they should be an "expert" in a certain clinical area and have experience in writing systematic reviews in order to be a useful co-mentor. However, the problem here is that, at the School of Medicine in Split, there are few professors experienced in writing systematic reviews. So, the goal of this comment is not constructive but, rather, yet another discriminatory remark aimed at denouncing individuals as incompetent mentors. This would not count as discrimination only when the same idea about appointing co-mentors would be applied to all dissertation topic applications regardless of the type of research that would be conducted within the proposed doctoral dissertation.

In 2014, the Bylaws, which regulate the types of research that can be conducted within a doctoral dissertation, allowed for the possibility for dissertations to be based solely on systematic reviews. However, even then, there were cases where certain committees for evaluating a dissertation topic would insist that the student needs to conduct an additional. primary study because they did not consider writing several systematic reviews to be substantial enough to qualify as a doctoral dissertation. One such committee even suggested that the student "cobble together some kind of guestionnaire" which would be handed out to hospital patients over the course of a few days since this would resolve the problem of a lack of primary research in the proposed dissertation topic. Therefore, any type of bad primary research is good enough for these "experts" compared to a systematic literature review

In 2014, the Bylaws, which regulate the types of research that can be conducted within a doctoral dissertation, allowed for the possibility for dissertations to be based **solely on systematic reviews**.

The undesirability of questionnaire-based research At the Doctoral School Council, whether or not students should do studies based on questionnaires as part of their dissertations was also a topic of discussion. Some of our professors do not want this because "people change their opinions all the time". It is true that not all types of evidence are equal. Different research methods

vary based on their reliability and risk of bias: none are ideal. Surveying, or looking for peoples' opinions is a type of methodology that has its shortcomings, but, in many research areas, there is no alternative. There is no other way for us to analyze individuals' attitudes and perceptions, how much pain they feel, etc. unless we ask them. Unfortunately, such a superficial argument, according to which people as study participants cannot be trusted, should be applied to any situation where people are asked to make some kind of statement. For example, in biomedical research, increasing emphasis, is placed on patient-reported outcomes. In addition to that, pain is, by definition, what the patient says it is. Does that mean we won't believe this data? Does this mean that any research done on pain is thus not good enough to meet the intangible and approximate criterion of a person that believes that a patient's report about their opinion and experience are not reliable? What's often the case here is a lack of knowledge of certain methods. So, for example, the degree of methodological rigor of immunohistochemical methodology is dependent on thorough methodological knowledge, which, in the end, leads to the fact that the better you know the methods, the more inclined you are to look for confirmation using other lines of evidence. Therefore, in addition to verifying that the scientific methods have been implemented in accordance with the principles of good science, this piece of criticism should be weighed against the realistically estimated level of rigor that is possible under given circumstances.

The undesirability of soft science dissertations

Hard science and soft science are colloquialisms that are used to compare scientific areas based on perceived methodological strictness and objectivity. Roughly speaking, the natural sciences (for example, physics, biology, astronomy) are considered to be "hard", while social sciences (e.g., psychology, sociology, anthropology) are commonly described as "soft" sciences. In biomedicine, the term "soft science" is most commonly used for research that is not conducted in a laboratory or a clinical setting. In these types of research, it is quite common to use a methodology that does not belong solely to the field of biomedicine but to other scientific disciplines as well, such as psychology or sociology. Scientists that are not familiar with this type of methodology label them as unreliable. All of this leads to the stigmatization of scientific research that falls under the colloquial term "soft science".

As is often the case, such stigmatization is not general but is specifically aimed at research of individuals whose above-average productivity attracts the attention of those who have bad opinions about such types of research or who use various pseudo-arguments (listed below) in hopes of lowering the value of this research.

In debates and in terms of the measures that are being planned to solve this "problem", it is possible to use various arguments that can be based on different criteria. Some claimed that "soft science" research done within the scope of a doctoral dissertation can harm the School. In principle, it is easy to agree that the basic criterion for determining the suitability of a piece of research should be the benefit or harm that it can cause the School. However, it is not easy to determine what the parameters of these "benefits and harm" might be. Most would probably agree that the benefits of a specific study can be evaluated based on the number of publications and citations or through the amount of money that a research project, within which that specific piece of research is being conducted, brings to the School.

We can also define the "harm" done to the School in different ways. Unfortunately, it is not easy for us to provide a sensible example of "harm" here because we cannot think of one, but it is likely that those who speak out against such research may indicate some type of "harm" that such research brings about. So, one of our professors here in Split likes to say that such research is the "biggest evil that has ever befallen our School". The TRIBE program was highlighted as being responsible for introducing soft science to the School even though doctoral dissertations that could be described as "soft science" had been written at doctoral programs at the School even before TRIBE. What's at hand here is a problem that does not exist and is made up. Faculty teachers have the academic freedom to do whatever research they want. If it wants to, the School can encourage certain types of research through strategic documents. In our case, this research profile is part of both the old and the new School strategy and part of its future, as shown through the activity of the Croatian Cochrane branch and the Center for Evidence-Based Medicine. It is important to note that this research takes nothing away from other types of research and that it in no way puts other researchers in jeopardy.

If someone feels it is necessary to increase the proportion of preclinical experimental research in the scientific production of the School, this cannot be solved by limiting and banning research in other scientific areas but by helping preclinical researchers. One of the authors (DS) has spent his entire career conducting experiments with laboratory animals, and his experiments are among the most complex that have been done at the School. So, we are very familiar with the challenges of preclinical research. Support for fundamental experimental research can be achieved by strengthening the Research Support Department, relieving researchers from accounting and administrative work related to project management, better support for work with lab animals especially, by helping researchers not to search for veterinarians outside of the institution when certain procedures are carried out on animals or, for example, by the institution clearly announcing that part of the experiments conducted on laboratory animals can be carried out within laboratories and not only in laboratory animal housing. Until young scientists start to distinctly feel this type of support, it will be difficult for them to remain committed to basic research, being faced with a series of obstacles.

Furthermore, if someone wishes to ban certain types of research within doctorates, then this should be specified in the current Bylaws so that nobody will even consider conducting such research. The undesirability of certain types of study designs should not be determined on a case-by-case basis, as it is currently being done, because the result is pure discrimination against individuals.

The problem of clinicians obtaining doctorates on topics that are not closely related to their profession Countless times, we have heard criticisms aimed at clinicians (i.e. practicing physicians) who conduct their doctoral dissertations on topics that are not closely related to their everyday clinical work. This problem is very old and present in all medical schools in Croatia. The reasons that lead to it are well known, and we face them daily. Clinicians choose to conduct studies on preclinical, public-health, and methodological topics because they cannot find mentors for their doctorates among clinicians. Thus, physicians are being pragmatic, and they choose productive mentors outside of the clinic. Then, they conduct systematic reviews, "soft science" research, or basic research. For example, a significant number of clinicians have written dissertations on preclinical research at the departments of histology, embryology, physiology, pharmacology, biology, or neuroscience at the School of Medicine in Split. We often see a kind of "partial blindness" in such arguments.

Doctoral students are free to choose mentors from those that are available to them, and the only way to steer them toward certain research is through an **institutional strategy**.

> We see no problem here because academic freedom presumes precisely the freedom of scientific research. Doctoral students are free to choose mentors from those that are available to them, and the only way to steer them toward certain research is through an institutional strategy. Still, those who are concerned about such a state of things often offer a

to see all kinds of incredulous situations by now. One student submitted a dissertation topic wanting to study anxiety in children, among other things. The main comment on that topic was that it was not a biomedical one. even though anxiety is included in the International Classification of Diseases. We had to prove multiple times that medical ethics is a part of clinical medicine. even though this is explicitly stated in the Ordinance on scientific and artistic areas, fields, and branches of the National Council for Science (branch 3.02.15 medical ethics, field 3.02, Clinical medical sciences. area 3. Biomedicine and health care).

Biomedical research includes a broad area of science devoted to researching biological processes, preventing and treating diseases, and genetic as well as environmental factors associated with diseases and the health of both humans and animals, 13

It is not appropriate to simply say "this study is not medicine" because there is no clear-cut division of methodologies belonging to different scientific fields. If a study is to be assessed as being biomedical or not, based solely on one part of the research methods, many studies at our School could be arbitrarily assessed as non-biomedical because they use methods from biochemistry, cellular biology, and molecular biology (natural sciences), as well as biotechnology. According to the Croatian Ordinance on scientific and artistic areas. fields, and branches, these branches belong to the field of biology: microbiology, genetics, biochemistry, and molecular biology. According to the same Ordinance, genetics, medical biochemistry, and medical microbiology are included in the field of biomedical sciences, though molecular biology is not. The fact that this Ordinance did not predict that molecular biology would be a research area in biomedicine should not be a reason to label university research that uses molecular biology methods as non-biomedical. The same

> applies to university research that could easily fall into the category of biotechnology.

This issue has been discussed very often at the School, especially in recent times in the context of

variety of solutions to the problem. Attempts to resolve this problem by restricting certain study designs are completely flawed because this will only lower the number of doctorates. By restricting access to "non-clinical" mentors, the number of clinical mentors does not grow. Besides, this would also lead to the problem of defining topics that may or may not be closely related to the candidate's clinical profession, which, in our easily corrupted and clientelistic environment, would once more lead to discriminatory decisions that would be inconsistent and would instead differ from one case to another. This problem also cannot be resolved by changing the conditions for academic advancements or by raising the number of mentorships required to advance in one's career. We know this because we have seen it happen. A while ago, criteria for academic advancement at the School were revised by including a new request — that one needs to be a mentor for at least one doctorate. The teachers responded by assigning themselves as dissertation co-mentors. Therefore, clinicians did not rush to become the sole mentors themselves but rather started looking for someone to name them as co-mentors for doctorates that were already in progress.

We would only be able to resolve this issue by helping our clinician colleagues in mentoring students. At the TRIBE program, we help mentors in scientific methodology and statistics and, by doing so, help them to prepare a good research plan. This has proven to be a very successful model. However, our capacity for such support is limited and, to provide such support to a larger number of mentors, radical institutional changes in the availability of support for mentors would be required. If that were to happen, we are confident that the number of clinical mentors for doctoral dissertations would increase.

The problem of topics that "don't belong" to biomedicine

TRIBE's directors are continuously criticized for enrolling students without biomedical backgrounds or students conducting studies on a topic that "is not medical". However, we were not provided with definitions of what medicine is. And we have really gotten

13 Flier JS. Loscalzo J. Categorizing biomedical research: the basics of translation. FASEB J. 2017; 31(8):3210-3215.

The extent of this resistance is best demonstrated by the fact that, at the meeting of the Doctoral School Council on September 17, 2013, it was decided that the TRIBE program should be transferred from the School to the University because the research topics that TRIBE had been receiving did not fit in with the medical program. Namely, even though the School of Medicine in Split is associated with the University of Split, they are two separate legal entities. As a rule of thumb, such discussions were held under the guise of apprehension for the School's reputation and the objections that could befall the School. which is supposed to conduct biomedical research. This reaction resulted from our persistent insistence that students of various backgrounds who want to conduct biomedical research be allowed to obtain their doctorate within the TRIBE program. Until then, the problem of junior researchers wanting to enroll in a doctoral program and who were employed at the School, but did not have a medical background, was solved by a simple wave of the hand and saving "let them go to Zagreb". Such an approach created huge costs for students as well as the institution through their absence from work. It also significantly reduced the scientometric output of the School since valuable studies in the field of biomedicine were attributed to other doctoral programs. The School dean at the time prevented the attempt to transfer the TRIBE program to the University, but problems and criticisms of our approach to educating people of different professions continue to this day.

This problem exists only in some individuals' minds as we are not aware that the School ever received any formal complaints from any higher authority about the kind of research that is being conducted at the School or about awarding doctorates to those who "do not deserve them". On the contrary, the TRIBE program was explicitly commended in its international review during the re-accreditation process for its dissertation topics, which demonstrate that it encourages interdisciplinarity in biomedicine. If the Committee for Doctoral Dissertations was to apply unjustifiably rigorous standards in assessing the relevance of a certain topic for biomedicine, the School would lose numerous candidates who would, because of this, enroll in other doctoral programs. On top of this, the research assistants working at the School that did not obtain their master's degree in the area of biomedicine would then be forced to enroll in doctoral programs at different Schools, and their tuition fees would have to be paid for by the School.

More developed scientific communities in the West do not have this problem because they do not use such strict divisions of scientific areas, fields, and branches as we in Croatia do. Rather, such research is simply included in the field of life sciences. They thus encourage interdisciplinary and assign projects accordingly. This approach is also applied in international competitive projects such as those within the Horizon Europe program and its "Life Sciences" category.

Based on our personal experience. laboratories in Croatia that continually maintain international ties and actively take part in international consortia are rare. This separation from the international academic community and poor or non-existing communication with scientists outside of one's laboratory can easily start to weigh an institution down. For such researchers, their research starts to take on more and more significance each day, up to the point when it overshadows everything that is going on in their closer or wider scientific community. Wise researchers have long ago come to realize that cooperation should be fostered in science, as this is precisely what will prevent one from developing a warped and biased view of one's own significance in the scientific community. Unfortunately, a certain number of people in the academic community tend to waste their lives on lazy and fruitless comments of other people's ideas and focus most of their energy on viciously disabling all their potential rivals. Thus, we arrive at a situation where some doctoral dissertation topics are easily discredited

As one potential solution, it has been proposed that some kind of prior control of topics by the Committee for Doctoral Dissertations should be introduced before the study is even started. The proposal was that students and mentors who wish to work on potentially problematic topics should approach this Committee in the research planning phase and ask for its "approval" to delve into such topics. In theory, that sounds fine for all doctoral students they should submit their research plans for approval before starting their studies. However, this suggestion deviates from the current Bylaws, according to which the student can apply for a doctoral dissertation topic only after the student has published their first article in a scientific journal.

Furthermore, if things were to move in the direction of changing the Bylaws, then it should be defined whether the evaluation of a topic is to be carried out before or after the enrollment of a candidate in the Program. This is because, if a candidate wanted to begin some research that they would not be allowed to conduct at the School, they most likely would not want to enroll in one of our doctoral programs. Therefore, if the evaluation of a topic were to be conducted before enrolling a candidate, then the Committee for Doctoral Dissertations would take on the role of the program directors and choose who, and with what topic, would be enrolled and who would not. If the evaluation were to take place after enrollment, then other regulations would have to be changed so that the process could be reverted to the "old system" whereby evaluations of doctoral dissertation topics are performed in the protocol phase and not when a dissertation is partly or completely finished and by the time a student has published at least one article so they can submit their topic. It is clear that there must not be any kind of discretionary review done on the part of the Committee for Doctoral Dissertations since this would, again, lead to discrimination. If the Committee for Doctoral Dissertations is to evaluate the eligibility of all research topics in the protocol phase, then this

should be a transparent part of the formalized processes within the School.

One solution proposed to prevent case-by-case and potentially discriminatory decisions was that all articles that were indexed on PubMed be considered "biomedical". We believe that this could be a viable solution. Otherwise, we will face constant conflict in which individuals, based on their discriminatory assessments, will declare certain topics non-medical.

Changing research protocols mid-program

Over the past ten years, some students have changed their mentors and some have entirely changed their research plans in comparison to the protocol(s) that they had sent us when enrolling in the Program. As program directors, who take great care of student progress, we, of course, would like to be informed about any plans to change research protocols. We would like for our students to inform us of any changes and to have a chance to see the new research plans.

However, we have been in several situations where students have presented us with a fait accompli after a certain period of inactivity. When the time would come for their progress report, they would present new research that they had already started without previously sending us the protocols for it. If their new plans are flawed, we are powerless in that situation. If they had come to us with this research plan on enrollment, we would have never enrolled them in the Program. If some of them had listened to our advice on their new, flawed research plans, they would have saved themselves time, energy, and money invested in this new research of theirs. Some students change their research plans every few years; we give them advice, but they do not adhere to it, so we can only expect with great interest what new, bad idea they will present to us next. Luckily, those situations are extremely rare.

Organizational problems

The organizational problems that doctoral programs encounter are largely present in the organization of all other forms of teaching in higher education institutions. The majority of these problems are the result of insufficiently developed business procedures that often do not have strictly defined deadlines, people responsible for their implementation, or are simply the result of a corruptive environment in which they are taking place.

Engaging external teachers

Money is always a problem — when there is enough of it and when there is not. Thanks to careful management of the program's resources (after all, one of the program's directors is from the island of Brač, whose inhabitants are famous for their frugality), TRIBE has always had enough money to cover all its expenses, including honoraria for external teachers, i.e. teachers not employed at the School. One would expect that this would not be a problem when there is enough money. But, unfortunately, paying external teachers has been a problem for the past 10 years; one which makes you embarrassed year in and year out. When planning the yearly schedule for the program, as is done at the start of every academic year, we have to brace ourselves for emails that say something along the lines of: "Yes, I will teach classes this year as well, but, you know, I still haven't received payment for last year's work." So, among our external teachers, we have to choose those

who would agree to receive an honorarium a year or a year and a half after they've finished teaching their classes or, rather, those that can endure the illogical functioning of the system. Students are obliged to pay their tuition fees when enrolling in each academic year. Therefore, the funds required to pay honoraria exist. Nevertheless, external teachers are not paid until at least a year passes from their teaching. In these 10 years, we have raised this problem countless times but to no avail.

The reasons why this problem exists are numerous: the legalities and bureaucracy make everything more difficult. Still, the main reason is that nobody has tried to systemically resolve this problem and find solutions to speed up this process. However, the solutions are simple and available. One of the actions that would surely speed up the process is precisely defining the administrative staff in charge of payment for external teachers. Additionally, introducing a digital signature that could be used for signing contracts or delivering reports about classes held would significantly speed up the process. We can only hope that, sometime in our careers, we will live to see the report about classes held delivered with a few clicks rather than with 50 or so signatures. Until this happens, we will continue to sign and stamp papers and can only apologize to our external teachers and continue letting them know that we appreciate their work.

Pressure to enroll students in the program

When you have three postgraduate programs at the School, you would not expect there to be any major problems when it comes to enrollment in one of them. Yet, this is not what things are really like. In a number of cases, we have had to struggle with enrolling candidates whose research plans simply were not good enough or well-prepared enough for enrollment in the TRIBE program. Usually, we do not experience any problems with the candidates. Rather, the problem is typically in the vanity of mentors who are not used to criticism of their research plans. Such pressure even resulted in the Dean's Collegium requesting and scrutinizing the enrollment list for the TRIBE program in 2018, which is the only case of its kind in the School's history. One dissatisfied mentor even accused us of compromising one of the School's undergraduate programs by running the program in this manner (due to our restrictive choice of candidates). On the contrary, we believe that, by having high expectations from the candidates we enroll, we are helping the School. Through providing constructive criticism, we try to help candidates and mentors make their research better in the end, ensuring better success rates. If that means that some candidates will need to enroll the following year. so be it.

We have seen these kinds of situations in our regular annual student progress reports when some mentors took criticism directed at their students very personally. The situation is quite simple — TRIBE is not the only doctoral program in the world. All students and mentors who do not like the idea of getting constructive criticism for improving are free to choose a different doctoral program. Any piece of constructive criticism and any suggestions that we have ever given anyone have had the sole purpose of helping candidates to enroll and aiding enrolled students in achieving better results.

Administrative support

At a certain point in time, an analysis of all the business processes that take place at the School was conducted with the goal of completely computerizing the School. The ARIS application was used to achieve this. 14 Through working on this project, one could learn that there are three main groups of business processes at our institution. The key processes are those that make us a scientific and educational institution. The processes behind education, scientific research, and scholarly work fall into this category. In order for these key processes to move forward, managerial as well as support processes are required. As their name

14 Sapunar D, Grković I, Lukšić D, Marušić M. The business process management software for successful quality management and organization: A case study from the University of Split School of Medicine. Acta Med Acad. 2016;45(1):26-33. suggests, support processes should encompass all work that has the goal of facilitating the implementation of these key processes. Not many people like bureaucracy,

and many university professors are

prone to shying away from such work. Unfortunately, conducting serious business is not possible without paper trails. Nevertheless, we should strive towards optimizing all business processes so that they can be performed as quickly as possible and with the least cost possible. In all of this, the offices that should be helping us to work as best as we can should be playing the main role. Sadly, what happens more often than not is the exact opposite. Instead of assistance, we have often come across obstruction and insistence on irrelevant things from administrative services at the School. The Office for Postgraduate Studies.

which is meant to ensure proper administrative support for our postgraduate programs, used to have staff that was very hard to work with. Our students have complained to us multiple times that the Office staff had made negative comments about the organization and quality of the TRIBE program as well as the quality of TRIBE mentors. Our students had been told that TRIBE is poorly organized and is a mess. They had also been frightened into thinking that the doctorates that they obtained at TRIBE would not be accepted in a clinical setting and that they could not include systematic literature reviews in their dissertations, even though this was defined by the Bylaws. One of TRIBE's graduates was slandered by the Office staff repeatedly, being accused that his mentor had written his dissertation for him. On multiple occasions, we found out that administrative staff responsible for providing support to doctoral programs had requested that the directors of the TRIBE program do work that this same Office had regularly done for the directors of other doctoral programs at the School. The directors of the program have explicitly been told by the Office, several times, that a new doctoral program at the School is unnecessary; in fact, that the Biology of Neoplasms program was bad and unnecessary as well. And all of this because of their protective stance and favoritism towards the first doctoral program established at the School. We had informed the School's management at the time of these problems on several occasions but we did not manage to get support. Changes ensued only after a new head of the Office was appointed.

Excluding representatives of the program from the Committee for Doctoral Dissertations

For years after TRIBE was established, we found ourselves in the situation where, unlike other doctoral programs, a representative of TRIBE was not included in the Committee for Doctoral Dissertations — the body that makes decisions on the process for obtaining a doctorate. During one presentation of certain proposals by the members of the Committee for Doctoral Dissertations at a School Council meeting, when they were asked why the director or deputy director of the TRIBE program were not included in the Committee for Doctoral Dissertations, the vice dean at the time responded by saving we were left out because of a conflict of interest. There was no response as to why representatives of the other two doctoral programs being included in the Committee was not thought to be a conflict of interest. After repeated inquiries, the only response we were able to get was that this was the decision of the School management.

Such a decision by the management could be considered as part of its legitimate right to determine the composition of the School's committees. Unfortunately, the Committee is not only the body that evaluates doctoral dissertation topics; it has also become the body that equalizes the criteria for obtaining a doctorate. Sadly, this body, occasionally, takes upon itself the authority that it does not have according to the Bylaws. One example is an attempt at rejecting an application for a doctoral dissertation topic at the level of the Committee, despite the fact that the governing Bylaws state that applications for doctoral dissertation topics are evaluated by the Committee for Evaluating Doctoral Dissertation Topics, which then suggests whether the topic should be accepted, revised or rejected. So, by excluding a representative of the TRIBE program from the Committee for Doctoral Dissertations, (just) one program is completely left out of the decision-making process.

Moreover, we believe that it is necessary to consider the mentoring experience of an individual when selecting members of the Committee for Doctoral Dissertations rather than their clinical profile.

Student structure based on the source of funding

| Student status | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
|--|------|------|------|------|------|------|------|------|------|------|------|-------|
| | 2010 | 2011 | 2012 | 2010 | 2014 | 2010 | 2010 | 2017 | 2010 | 2010 | 2020 | 70 |
| Enrolled | 15 | 12 | 14 | 14 | 12 | 11 | 11 | 18 | 16 | 10 | 14 | /8 |
| Unenrolled | 1 | 1 | 2 | 3 | 0 | 0 | 0 | 1 | 2 | | 1 | 7 |
| Self-funded | 5 | 3 | 6 | 5 | 5 | 7 | 4 | 16 | 7 | 8 | 8 | 31 |
| School employ- ees exempt from tuition | 4 | 5 | 1 | 2 | 2 | 0 | 3 | 1 | 2 | | | 14 |
| Funded through a research project | 1 | 2 | 5 | 3 | 4 | 3 | 4 | 2 | 2 | 1 | 3 | 18 |
| Other sources of funding | 4 | 1 | | 1 | 1 | 1 | | | 3 | 1 | | 8 |

Professors who have, up to that point, mentored only one doctoral candidate or even none have been appointed as members of this Committee. On the other hand, in 2011, the director of the TRIBE program was awarded for his numerous successful mentorships.

After many years, this situation was resolved by the decision to not include any directors or deputy directors of the School's doctoral programs in the Committee for Doctoral Dissertations. However, nothing lasts forever; in 2020, we went back to the way things had been. Representatives of only two doctoral programs are members of the current Committee for Doctoral Dissertations (guess which doctoral program is not represented on the Committee).

The program's finances

The tuition fee for the TRIBE program is 16,000 HRK per year (around 2.100 EUR) and is lower than the tuition fee for the other postgraduate programs at the School, University, as well as other universities in Croatia. The difference is based on a feasibility study that was conducted upon establishing the TRIBE program in which revenues and expenditures of previously initiated programs at the School were thoroughly investigated. A precise tuition fee was calculated based on this analysis; one whose goal would not be generating revenue but rather the self-sufficient maintenance of the program. In a review of the structure of doctoral students based on their source of funding, it is clear that a relatively small number of students are funded by grants and that a large number of them pay for the tuition fee personally, which additionally justifies the low tuition fee. The tuition fee at TRIBE is the same for Croatian and foreign nationals.

The TRIBE program has proven that it is possible to function when charging a lower tuition fee, that it is not necessary to charge employees a tuition fee, and that a credit card, which the program's directors can freely use, is not required for a program to function. Until 2016, funds oathered through

tuition fees were allocated according to the Ordinance on the Ways of Using Own Income and Income for Special Purposes. In accordance with this document, income from tuition fees was used to cover the expenses of common offices for postgraduate studies, visiting professors' expenses, and the expenses of the laboratories in which the practical part of doctoral dissertations is conducted. Based on that document, 20% of the total income was set aside for the School's operating costs. Even though the Ordinance states that the program director is obliged to submit a financial report to the School Council once a year on how those funds have been spent, this topic has never found its way onto the Council's agenda.

By abolishing this Ordinance and adopting a new Ordinance on the Ways of Using Own Income and Income for Special Purposes, since March 17, 2016, 20% is no longer set aside for the School. It has instead been decided that, from 2016 onward, doctoral program funds cannot be carried over from one year to the next. Instead of setting aside 20% as per the dean's instructions, the leftover funds from that financial year were no longer carried over to the next year but were transferred to the School's account and included in its total balance.

This practice was abandoned in December 2019 when a new regulation was introduced according to which, from January 1, 2020, 30% of the doctoral programs' income would be set aside for the School's operating costs, providing a defined way of transferring the initial financial status into the next year.

Income and expenses of the TRIBE program and funds allocated for the School of Medicine in Split

Croatian kuna (in thousands)



The revenue-expenditure relationship clearly shows a severalfold increase in funds that were being taken from the program's account and transferred to the School's account because they were not being carried over. These provisions also led to an expected increase in the material costs of the program. To elaborate, since it was not possible to carry over funds, it was not possible to build up savings. So, during the mentioned period and over the years, the expenses also grew.

Distribution of funds generated from tuition fees from the establishment of the TRIBE program to 2021 (amounts are expressed in Croatian Kunas)

| Year | 2011 | 2012 | 2013 | 2014 | 2015 |
|--|---------|---------|---------|---------|---------|
| Income from tuition fees | 94.000 | 210.000 | 415.828 | 236.468 | 229.359 |
| Income from enrollment fees | 3.850 | 3.150 | 2.400 | 3.979 | 650 |
| Other income | | | | | |
| Unspent (transfer to the next year) | 54.091 | 196.380 | 419.211 | 464.539 | 544.500 |
| Total income | 151.941 | 409.530 | 837.439 | 704.985 | 774.509 |
| Allocated for the School (20%, and 30% since 2020) | 19.570 | 29.830 | 58.046 | 48.089 | 46.002 |
| Transfers made to the School | | | | | |
| Allocations to the School | 19.570 | 29.830 | 58.046 | 48.089 | 46.002 |
| Allocated for the University(3%) | 2.935 | 4.474 | 8.707 | 7.213 | 6.900 |
| Material costs | 17.760 | 13.494 | 49.002 | 83.266 | 74.508 |
| Equipment | 3.494 | 7.800 | 37.935 | 40.456 | 42.483 |
| Travel | | | 10.435 | 11.063 | 7.573 |
| Honoraria | | 15.263 | 31.273 | 5.031 | 25.482 |
| Total expenses | 21.254 | 36.557 | 128.645 | 139.817 | 150.047 |

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | Total |
|--|---------|---------|---------|---------|---------|-----------|
| Income from tuition fees | 432.062 | 620.686 | 536.343 | 567.327 | 520.085 | 3.862.158 |
| Income from enrollment fees | 7.430 | 4.200 | 3.150 | 6.800 | 5.600 | 41.209 |
| Other income | | 144 | | 3.458 | | 3.603 |
| Unspent (transfer to the next year) | 459.633 | | | | 155.540 | |
| Total income | 899.125 | 625.031 | 539.493 | 577.586 | 681.225 | 3.906.970 |
| Allocated for the School (20%, and 30% since 2020) | | | | | 142.103 | 34.3640 |
| Transfers made to the School | 637.762 | 346.338 | 309.295 | 377.303 | | 1.670.698 |
| Allocations to the School | 637.762 | 346.338 | 309.295 | 377.303 | 142.103 | 201.4337 |
| Allocated for the University(3%) | 12.962 | 18.846 | 16.090 | 16.900 | 16.900 | 111.927 |
| Material costs | 123.177 | 187.435 | 97.978 | 130.595 | 57.242 | 834.457 |
| Equipment | 6.574 | 25.887 | 21.626 | 2.747 | 2.747 | 191.749 |
| Travel | 76.852 | 41.745 | 69.198 | 29.937 | 29.937 | 276.741 |
| Honoraria | 41.799 | 4.780 | 25.306 | 20.104 | 20.104 | 189.141 |
| Total expenses | 248.401 | 259.847 | 214.108 | 183.383 | 110.031 | 5.632.690 |

-> Teaching plan and program

Teaching plan and program

The teaching plan and program have not changed considerably in the 10 years since TRIBE was founded. The changes that were made were mainly minor and pertained to the number of teaching hours and suspending or introducing new elective courses. Some courses that were initially mandatory were made elective after we kept receiving feedback from students saying that they were less relevant to them. However, we made extensive changes in our approach to grading courses. Initially, students received a grade ranging from one to five for each mandatory and elective course. This is in line with the grades used in the Croatian educational system. Grade one (1) is a non-passing grade, grade two (2) is "Sufficient", grade three (3) is "Good", grade four (4) is "Very good", and grade five (5) is "Excellent".

In the second phase, we started grading progress reports to emphasize their importance to students. We stopped using numerical grades for other courses and introduced only pass/fail scoring. However, feedback from both students and staff encouraged us to change that once again. Students suggested that we give more numerical scores, which allowed some of them to apply for scholarships to pay their tuition fees. On the other hand, some professors complained that students were putting in less effort without numerical grades. In the meantime, we also decided to relieve our teachers of some administrative tasks related to courses and exam reports. Thus, we introduced the third grading phase in 2016/2017. Namely, we merged all of the mandatory first-year courses into two large courses that now, once again, were graded on a standard numerical scale from one to five. Second-year elective courses are still graded on a pass/fail basis. Progress reports continue to be scored with grades from one to five.

The program from its establishment to the academic year 2016/2017

Mandatory courses

Mandatory courses are taught during the first year of the program. They encompass two groups of courses:

a) common mandatory courses (CMCs) and

b) mandatory courses of the TRIBE program.

The first group includes courses whose goal is to familiarize students with the general principles of scientific work and methods for collecting, analyzing, and presenting scientific data. Within the first group of courses, students must earn 18 ECTS credits. Courses such as General biostatistics, Writing a research article, Ethics in research, etc., belong to this group. The second group includes mandatory courses specific to the TRIBE program (12 ECTS credits in total). These courses are supposed to familiarize students with the specifics of certain scientific branches closely related to the content of the postgraduate program. Credit (ECTS) system of the TRIBE program

| | First year I-II | Second year III-IV | Third year V-VI | Total |
|--|--------------------|-----------------------|--------------------|-------|
| Common mandatory courses (CMCs) | 18 | | | 18 |
| Mandatory courses of the TRIBE program | 12 | | | 12 |
| Elective courses of the TRIBE program | | 12 | | 12 |
| Elective courses from other programs | | 8 | | 8 |
| Other activities | 20 | 20 | | 40 |
| Individual work with a mentor and on the doctoral dissertation | 10 | 20 | 60 | 90 |
| Total | 60 | 60 | 60 | 180 |

Common mandatory courses (mandatory courses common to all of the School's programs)

| First year | | |
|---|--------|--------------|
| Course (Course instructor) | L+S+P | ECTS credits |
| Introduction to scientific research (Matko Marušić) | 6+6+4 | 3 |
| General biostatistics (Davor Eterović) | 5+5+10 | 3 |
| Writing a research manuscript (Ana Marušić) | 2+4+9 | 3 |
| Writing the research plan (Matko Marušić) | 0+20+0 | 3 |
| Writing a research grant (Ivica Grković) | 2+13+0 | 2 |
| Assessment of a research article (Zvonko Rumboldt) | 4+6+0 | 1 |
| Ethics in research (Zvonko Rumboldt) | 6+0+4 | 1 |
| Searching the medical literature (Jelka Petrak) | 2+6+6 | 2 |
| | | 18 |

L lectures S seminars P practical

Mandatory courses of the TRIBE program

| First year | | |
|---|---------|--------------|
| Course (Course instructor) | L+S+P | ECTS credits |
| Lab management and laboratory animal science (Damir Sapunar) | 2+8+6 | 3 |
| Laboratory animals and animal models (Ana Marušić) | 4+6+6 | 2 |
| Molecular and biochemical methods in biomedical research (Maja Pavela-Vrančić) | 5+3+12 | 2 |
| Entrepreneurship and transfer of technology (Mile Dželalija) | 10+10+5 | 2 |
| Methods for isolation of bioactive substances (Igor Jerković) | 10+2+8 | 3 |
| | | 12 |

L lectures S seminars P practical

Elective courses of the TRIBE program

| Course (Course instructor) | L+S+P | ECTS credits |
|--|---------|--------------|
| The puzzle of pain (Damir Sapunar) | 6+4+4 | 2 |
| Human embryo research (Mirna Saraga-Babić) | 6+4+4 | 2 |
| Glycobiology of hematopoiesis (Vedrana Čikeš Čulić) | 2+4+10 | 2 |
| Glycobiology of the immune system (Anita Markotić) | 4+6+5 | 2 |
| Molecular interactions of organ systems: osteoimmunology (Ana Marušić) | 3+5+7 | 2 |
| Adventures of pain in the brain (Livia Puljak) | 6+4+4 | 2 |
| Genetic analysis of complex diseases (Tatijana Zemunik) | 4+5+6 | 2 |
| Seeing the invisible (Damir Sapunar) | 2+4+10 | 2 |
| Development of human spinal ganglia (Katarina Vukojević) | 6+4+4 | 2 |
| $\label{eq:amplitude} \mbox{Amphioxus} - \mbox{a model for the evolution of chordates (Ivana Bočina)}$ | 5+5+5 | 2 |
| The basics of heart electrophysiology and bioenergetics (Marko Ljubković) | 3+5+7 | 2 |
| Colon cancer (Janoš Terzić) | 4+6+5 | 2 |
| Genome databases and statistics (Vesna Boraska) | 4+6+6 | 2 |
| The plasticity of the neurochemical phenotype (Ivica Grković) | 6+2+4 | 2 |
| Diagnostics of genetic and chromosomal diseases (Irena Drmić Hofman) | 7+4+4 | 2 |
| Oxidative stress and protection mechanisms — the role of uric acid (Mladen Boban) | 6+4+5 | 2 |
| Multivariate statistics (Goran Kardum) | 4+6+4 | 2 |
| Why and how do we breathe? (Zoran Đogaš) | 6+5+14 | 2 |
| Animal models in stroke research (Liana Cambj Sapunar) | 6+4+4 | 2 |
| Quasi-experimental and non-experimental research designs (Darko Hren) | 10+10+0 | 2 |
| Communication in living organisms (Mladen Miloš) | 6+4+4 | 2 |
| The role of ubiquitin in health and diseases (Ivana Novak) | 4+6+5 | 2 |
| Concepts of medical genetics (Boro Dropulić) | 3+5+7 | 2 |

L lectures S seminars P practical

Elective courses

Our elective courses were designed to promote interdisciplinarity. During their second year, every student must enroll in several elective courses. Our modular system allows students to choose between elective courses from other programs within the School as well. Most of TRIBE's students choose their elective courses from the TRIBE program's list. Elective courses can also be chosen among the other postgraduate programs within the University of Split provided that these courses, in total, do not count for more than 30% of the total course load for elective courses.

Elective courses aim to introduce students to specific narrower branches of research within the area of biomedicine and health care. Apart from broadening their knowledge, such courses are supposed to prepare students to write their doctoral dissertations in their chosen field and for work in laboratories.

TRIBE's teaching plan and program

| Year | Course | Course instructor | L | s | Р | ECTS credits |
|-------------|---------------------------------------|-------------------|----|-----|----|--------------|
| First year | | | | | | |
| | Principles of research in medicine | Damir Sapunar | 46 | 64 | 22 | 20 |
| | Transferable skills | Livia Puljak | 40 | 18 | 26 | 10 |
| | First report | Damir Sapunar | 0 | 10 | 0 | 5 |
| | Second report | Livia Puljak | 0 | 10 | 0 | 5 |
| | | Total First year | 86 | 102 | 48 | 40 |
| Second year | | | | | | |
| | Elective courses | | | | | 20 |
| | Third report | Damir Sapunar | 0 | 10 | 0 | 5 |
| | Fourth report | Livia Puljak | 0 | 10 | 0 | 5 |
| | | Total Second year | 0 | 20 | 0 | 30 |
| Third year | | | | | | |
| | Fifth report | Damir Sapunar | 0 | 10 | 0 | 5 |
| | Sixth report | Livia Puljak | 0 | 10 | 0 | 5 |
| | | Total Third year | | 20 | | 10 |

L lectures S seminars P practical

The program from the academic year 2016/2017 to 2021/2022

Mandatory courses

The fundamental change in the program starting from the academic year 2016/2017 was combining smaller first-year courses into two large courses. The goal of the first course, **Principles of research in biomedicine**, was to introduce students to the basic principles of scientific work as well as the methods for collecting, analyzing, and presenting scientific data in order to write their doctoral dissertations as best as they can.

The goal of the second course, **Transferable skills**, was to provide students with transferable and entrepreneurial skills. We believe introducing students to entrepreneurship and transferable skills is an essential part of the program, which is why we have integrated this into TRIBE's teaching plan and program from the beginning. The reason we consider these skills extremely important is that they enable the fostering of a culture of critical thinking, entrepreneurship, and innovation. Also, for students that will not work in academia, these skills will benefit them in a public, private, and clinical work environment.

Contents, objectives, and outcomes of the Principles of research in biomedicine course

Introduction to scientific research

Objective of the module To teach students to use all elements of research in biomedicine, from key research principles to publication of research results.

Learning outcomes After completing the course, students will be able to: understand the sources and paths of production of genuine knowledge, recognize types of clinical research studies, formulate a hypothesis and consecutively define main and secondary outcome measures, search for specific literature in relevant databases, critically appraise all parts of research reports, understand and apply the basic statistical concepts in biomedical research, present data with respect to their nature and meaning, understand the principles of evidence-based medicine and its use, understand the complexity of performing own research and apply principles of responsible conduct of research.

Searching the medical literature

Objective of the module To teach students to independently search for key sources of funding and search for scientific information in online databases.

Learning outcomes After completing the course, students will be able to: list and describe the main sources of medical information, define their search strategy, analyze the publications of individual scientists, implement searches within the main databases, define the principles of evidence-based medicine.

Writing a research manuscript

Objective of the module To teach students how to write research manuscripts, use a reference manager software, prepare figures, and submit manuscripts.

Learning outcomes After completing the course, students will be able to: describe the structure of a research article, independently write a scientific article, demonstrate usage of the EndNote reference manager software, independently use online manuscript submission systems, and independently prepare a figure for manuscript submission.

Assessment of a research article

Objective of the module To teach students to appraise the quality of research articles critically.

Learning outcomes After completing the course, students will be able to: critically evaluate publications, independently differentiate credible from poor sources of research information, independently assess the validity and reliability of research result assessments, and independently analyze the risk of bias in research.

Writing a research grant

Objective of the module To teach students how to write a research grant proposal.

Learning outcomes After completing the course, students will be able to: understand basic concepts of research proposals and the importance of the principal investigator and optimal research surroundings, distinguish various formats of project proposals, understand the process of evaluation of various project components, analyze and compare various parts of a project proposal, discuss the importance of the summary, understand the body of the proposal, understand and appreciate time constraints and the format that is a prerequisite for writing a proposal.

General biostatistics

Objective of the module To train students to independently evaluate the results of statistical analysis in published articles and develop their data analysis plan.

Learning outcomes After completing the course, students will be able to: understand and describe the basics of statistical reasoning; explain the results of statistical analysis; understand the use, advantages, and disadvantages of certain statistical methods; apply the algorithm for the choice of statistical tests; apply the methods for determining the sample size and statistical power of a study; synthesize knowledge of the study design; independently use statistical packages; present statistical aspects of the research results; critically evaluate statistical methods used in scientific articles.

Lab management and laboratory animal science Objective of the module To train students to perform basic laboratory procedures under supervision and to critically evaluate basic principles of research that involve experimental animals.

Learning outcomes After completing the course, students will be able to: understand the legislation and basic principles of laboratory work: manage human resources: describe and define procedures necessary for safe laboratory work: describe experiment planning procedures: describe basic laboratory equipment: use a laboratory notebook; name and explain the legislations involved in acquiring, care and use of animals in scientific research: describe and explain the methods for handling laboratory animals: describe the procedures for planning experiments in which laboratory animals will be used; define, describe and explain the 3R principles (reduce, replace, refine); critically analyze the basic ethical principles and ethical issues arising from the use of laboratory animals in research; name and describe the animals most frequently used in scientific research; describe, discriminate and explain the methods for anesthetizing and euthanizing laboratory animals.

Writing the research plan

Objective of the module To train students to independently write the detailed plan of research related to the topic of their doctoral dissertation.

Learning outcomes After completing the course, students will be able to independently prepare a research plan with 20 precisely defined elements: 1. Title of the research project, 2. Background, 3. Hypothesis, 4. Description and design of the study, 5. Sample, 6. Methods and procedures, 7. Main independent and dependent variables, 8. Treatment/intervention, 9. Main outcome measure(s), 10. Secondary outcome measure(s), 11. Calculation of the minimal sample size, 12. Statistical tests, 13. Possible biases and confounding variables, 14. Validity of the study, 15. Ethical approval, 16. Research funding, 17. Conflict of interest, 18. Literature (references), 19. Publication plan, 20. Authorship.

Contents, objectives, and outcomes of the **Transferable skills course**

Researchers' skills

Objective of the module To train students in transferable skills.

Learning outcomes After completing the course, students will be able to: explain principles of critical thinking, define quality assurance principles, describe and apply data management principles, describe principles of teamwork and work with a mentor, describe basic principles of management of a research group, describe principles of international collaborative work, describe and analyze interpersonal relationships problems in the work environment.

Communication and presentation skills

Objective of the module To train students to communicate with the media and professional communities.

Learning outcomes After completing the course, students will be able to: prepare a good presentation, present information in a highly efficient way, control public speaking anxiety, communicate with the media, prepare press releases, describe legislation related to media relations, describe principles of business correspondence, prepare a poster for a research conference, and organize a research conference.

Ethics in research

Objective of the module To train students in critical analysis of ethical principles related to biomedicine and related disciplines.



Upper photo Communication and presentation skills course

Lower photo Communication expert Krešimir Macan with TRIBE students and directors



Upper photo Academic year 2011/12 after Communication and presentation skills course

Lower photo Academic year 2014/15 after Communication and presentation skills course

Learning outcomes After completing the course, students will be able to: understand ethical principles and procedures related to research; explain ethical concepts of research on humans and experimental animals; apply basic knowledge in ethics to specific research activity; relate the knowledge of ethical principles with the methodology of research; compare different ethical principles in different ethical requirements and rules in EU countries; interpret the recommendations of the Ethics Committee on ethical approval for research; assess ethical aspects of research proposals and acquire skills to participate in the work of ethics committees; accept ethical and social responsibility for the success of research process, social benefit of the research results and possible social consequences.

Entrepreneurship and transfer of technology

Objective of the module To teach students skills in entrepreneurship and transfer of technology.

Learning outcomes After completing the course, students will be able to: understand how to become an entrepreneur; develop a successful business idea, independently and/or in cooperation with others; start an entrepreneurial company, independently and/or in cooperation with others; identify opportunities and generate ideas; perform a feasibility analysis; write a business plan; perform a competitor analysis; develop an effective business model; prepare appropriate ethical and legal foundations; assess the financial strength and viability of new ventures; construct a new business team; understand the importance of intellectual property; prepare for the challenges of growth and its evaluation; describe the strategy for growth companies; describe franchise.

Elective courses

Changes to the program from the academic year 2016/2017 to 2021/2022 did not significantly affect elective courses. We added new courses and left out those that the instructors could no longer teach.

Elective courses of the TRIBE program

| Course (Course instructor) | L+S+P | ECTS credits |
|--|---------|-----------------|
| Glycobiology of hematopoiesis (Vedrana Čikeš-Čulić) | 10+4+0 | 2 |
| Glycobiology of hematopoiesis (Vedrana Čikeš-Čulić) | 2+4+10 | 2 |
| Glycobiology of the immune system (Anita Markotić) | 4+6+5 | 2 |
| Adventures of pain in the brain (Livia Puljak) | 10+6+0 | 2 |
| Genetic analysis of complex diseases (Tatijana Zemunik) | 4+5+6 | 2 |
| Seeing the invisible (Damir Sapunar) | 10+0+6 | 2 |
| Development of human spinal ganglia (Katarina Vukojević) | 6+4+4 | 2 |
| $\label{eq:amplitude} \mbox{Amphioxus} - \mbox{a model for the evolution of chordates (Ivana Bočina)}$ | 5+5+5 | 2 |
| The basics of heart electrophysiology and bioenergetics (Marko Ljubković) | 3+5+7 | 2 |
| Colon cancer (Janoš Terzić) | 4+6+5 | 2 |
| Genome databases and statistics (Vesna Boraska) | 4+4+4 | 2 |
| Diagnostics of genetic and chromosomal diseases (Irena Drmić, Feodora Stipoljev) | 7+4+4 | 2 |
| Oxidative stress and protection mechanisms — the role of uric acid (Mladen Boban) | 6+4+5 | 2 |
| Multivariate statistics (Goran Kardum) | 4+6+4 | 2 |
| Why and how do we breathe? (Renata Pecotić) | 6+5+14 | 2 |
| Animal models in stroke research (Liana Cambj Sapunar) | 6+4+4 | 2 |
| Quasi-experimental and non-experimental research designs (Darko Hren) | 10+10+0 | 2 |
| Communication in living organisms (Mladen Miloš) | 6+4+4 | 2 |
| The role of ubiquitin in health and diseases (Ivana Novak) | 4+6+5 | 2 |
| Translational research of hearing and speech (Damir Kovačić) | 10+6+4 | 2 |
| The Cochrane Library and evidence in medicine (Livia Puljak) | 18+0+2 | 2 |
| Methods for isolation of bioactive substances (Igor Jerković) | 10+6+0 | 2 |
| Brain mapping (Maja Rogić) | 6+4+4 | 2 |
| How to construct your own organ (Sandra Kostić) | 6+10+0 | 2 |
| Molecular and biochemical methods in biomedical research Maja Pavela Vrančić) | 4+4+6 | 2 |
| How to choose a scientific journal (Ana Marušić) | 6+0+4 | 2 |
| The alphabet of a good night's sleep (Renata Pecotić) | 4+7+4 | 2 |
| Systematic review and meta-analysis (Livia Puljak) | 5+5+5 | 2 |

L lectures S seminars P practical

Changes to the program in the academic year 2021/2022

At its 31st meeting held on July 30, 2020, TRIBE's Council adopted smaller changes to TRIBE's teaching plan and program that were then sent to the School Council for approval before sending on to the Committee for Studies at the University of Split in accordance with the regular procedures. The following changes were suggested:

A) Canceling the following second-year elective courses:

- 1. Adventures of pain in the brain
- 2. Communication in living organisms
- 3. Methods for isolation of bioactive substances
- 4. Systematic reviews and meta-analysis

B) Introducing new second-year elective courses:

- 1. Communication standards for manuscript submission to a scientific journal (Ana Marušić)
- 2. Writing a doctoral thesis (Livia Puljak)
- 3. The science of breastfeeding and lactation (Irena Zakarija Grković)
- 4. A step-by-step guide to conducting a systematic review (Livia Puljak)
- 5. The plasticity of the neurochemical phenotype (Ivica Grković)

C) Changes to teaching hours and ECTS credits

The number of allocated teaching hours and ECTS credits were changed for the following elective courses.

- 1. How to choose a scientific journal (Ana Marušić)
- 2. How to construct your own organ? (Sandra Kostić)
- 3. The puzzle of pain (Damir Sapunar)
- 4. Seeing the invisible (Damir Sapunar)

- 5. Quasi-experimental and non-experimental research methods (Darko Hren)
- 6. The Cochrane Library and evidence in medicine (Livia Puljak)

D) Changes to the number of teaching hours without changing the number of ECTS credits

1. Changes were suggested for the **Transferable skills** course concerning the amount and structure of teaching hours so that the number of seminar hours is increased from 18 to 24 and the number of practical hours is lowered from 26 to 16 hours. Also, the learning outcomes were broadened, and the ratio of e-learning was raised from 0 to 20%.

2. Changes were suggested for the **Principles of research in biomedicine** course concerning the amount and structure of teaching hours so that the number of lecture hours be increased from 46 to 58, seminar hours be raised from 64 to 78, and practical hours be lowered from 22 to 14. The learning outcomes were broadened, and the ratio of e-learning was raised from 0 to 20%.

E) Introducing mandatory extracurricular activities

It was suggested that the mandatory extracurricular lecture series Excellence in science be introduced. Taking part in the activity would earn students ECTS credits.

F) Reducing the number of ECTS credits that students obtain through elective courses

According to the current program, the number of ECTS credits a student had to obtain through elective courses during their second year of studies was 20. We proposed that this number be lowered to 12 ECTS credits. All the suggested changes were approved.

List of mandatory and elective courses of the modified program

TRIBE's teaching plan and program

| Course | Course instructor | L | S | Р | ECTS credits |
|--|-------------------|----|-----|----|-----------------|
| First year | | | | | |
| Principles of research in medicine | Damir Sapunar | 58 | 78 | 14 | 20 |
| Transferable skills | Livia Puljak | 40 | 24 | 16 | 10 |
| First report | Damir Sapunar | 0 | 10 | 0 | 5 |
| Second report | Livia Puljak | 0 | 10 | 0 | 5 |
| | Total First year | 98 | 122 | 30 | 40 |
| Second year | | | | | |
| Elective courses | | | | | 12 |
| ${\rm Excellence} \ {\rm in} \ {\rm science} - {\rm lecture} \ {\rm series}$ | | | | | 8 |
| Third report | Damir Sapunar | 0 | 10 | 0 | 5 |
| Fourth report | Livia Puljak | 0 | 10 | 0 | 5 |
| | Total Second year | 0 | 20 | 0 | 30 |
| Third year | | | | | |
| Fifth report | Damir Sapunar | 0 | 10 | 0 | 5 |
| Sixth report | Livia Puljak | 0 | 10 | 0 | 5 |
| | Total Third year | | 20 | | 10 |

L lectures S seminars P practical

Elective courses

| Course (Course instructor) | L+S+P | ECTS credits |
|---|--------|-----------------|
| Amphioxus — a model for the evolution of chordates (Ivana Bočina) | 5+5+5 | 2 |
| Animal models in stroke research (Liana Cambj Sapunar) | 6+4+4 | 2 |
| A step-by-step guide to conducting a systematic review (Livia Puljak) | 18+0+2 | 3 |
| The basics of heart electrophysiology and bioenergetics (Marko Ljubković) | 3+5+7 | 2 |
| Brain mapping (Maja Rogić) | 6+4+4 | 2 |
| Communication standards for manuscript submission to a scientific journal (Ana Marušić) | 4+3+4 | 2 |
| Development of human spinal ganglia (Katarina Vukojević) | 6+4+4 | 2 |
| Diagnostics of genetic and chromosomal diseases (Irena Drmić, Feodora Stipoljev) | 7+4+4 | 2 |
| Genetic analysis of complex diseases (Tatijana Zemunik) | 4+5+6 | 2 |
| Genome databases and statistics (Vesna Boraska) | 4+4+4 | 2 |
| Glycobiology of hematopoiesis (Vedrana Čikeš-Čulić) | 2+4+10 | 2 |
| Glycobiology of the immune system (Anita Markotić) | 4+6+5 | 2 |
| How to choose a scientific journal (Ana Marušić) | 8+8+0 | 3 |
| How to construct your own organ (Sandra Kostić) | 8+8+0 | 3 |
| Molecular and biochemical methods in biomedical research (Maja Pavela Vrančić) | 4+4+6 | 2 |
| Multivariate statistics (Goran Kardum) | 5+6+4 | 2 |
| Oxidative stress and protection mechanisms — the role of uric acid (Mladen Boban) $% \left(\mathcal{M}_{\text{A}}^{(1)}\right) = \left(\mathcal{M}_{A$ | 6+4+5 | 2 |
| Plasticity of neurochemical gradients (Ivica Grković) | 6+6+0 | 2 |
| Quasi-experimental and non-experimental research designs (Darko Hren) | 12+8+0 | 3 |
| Seeing the invisible (Damir Sapunar) | 10+6+0 | 3 |
| The alphabet of a good night's sleep (Renata Pecotić) | 4+7+4 | 2 |
| The Cochrane Library and evidence in medicine (Livia Puljak) | 18+0+2 | 3 |
| The puzzle of pain (Damir Sapunar) | 12+4+0 | 3 |
| The role of ubiquitin in health and diseases (Ivana Novak) | 5+6+5 | 2 |
| The science of breastfeeding and lactation (Irena Zakarija Grković) | 10+4+0 | 3 |
| Translational research of hearing and speech (Damir Kovačić) | 10+6+4 | 2 |
| Why and how do we breathe? (Zoran Đogaš) | 6+5+14 | 2 |
| Writing a doctoral thesis (Livia Puljak) | 18+0+2 | 3 |

L lectures S seminars P practical

-> Our students





Lara Jane Maxwell









Zorka Vlahović

Minka Jerčić



Jennifer O'Neill



Ana Miljković



Drita Puharić

Ivona Božić



Danijel Nejašmić



Angela Mastelić





Domagoj Marković



Katarina Madirazza







Ivana Prkić



Ante Mihovilović







Ivana Bušelić



Mario Ivčević



Dina Bošnjak







Iva Jerčić











Andrea Gelemanović





Linda Ross<mark>ini Gajšak</mark>









Antonela Boljat

Adrienne Stevens



Luka Brčić



Nikola Ključević

Chantelle Marie Garritty



Maja Perkušić



Tihana Repić







Slavica Jurić Petričević

Ivan Velat







Krste Borić

Ana Marija Milat

Viktorija Radotić







Nikolina Davidović

Diana Jurić

Mirko Gabelica



Marija Šimundić Munitić



Porin Makarić





Helena Tomljenović

Ivan Buljan

Andrija Babić

Josipa Bukić

Iva Kraljević



Blanka Roje







Ivana Vuka

Melissa Sharp



Dario Leskur









Tanja Kovačević

Zoran Meštrović



Gorana Bilonić

Goran Pavlek

Filipa Markotić



Anita Vuković

Ružica Tokalić



Lenko Šarić



Marina Biočić

135





















Gorana Jerković





Igor Vuković

Dean Kaličanin









Berislav Šporčić



Anja Ančić







Adriana Andrić

Marin Viđak

Ognjen Barčot



Marina Krnić Martinić





Ivona Bućan





Darko Krnić



Maja Vajagić



Vicko Tomić



Candyce Hamel



Steffen Schnupp



Diana Aranza ->



Edita Runjić



137





Ivan Paladin

Viktorija Lišnić





Aleksandra Banić



Tina Pavelin



Ivna Olić

Mara Jurić-Kavelj



Ana Vidović Roguljić



Karla Gudelj









Marija Pancirov







Petra Zubanović

Lucija Franković

Dina Levačić

Nataša Grulović





Mirko Baglivo

Blaż Barun



Marijan Tepeš



Jakov Matas



Antonio Šarolić

Ivan Perić



Dora Čerina

Nikolina Pleić











139





-> Doctoral dissertations defended at the TRIBE program



Tea Andabaka and TRIBE Directors, Damir Sapunar and Livia Puljak

Andabaka Tea

Doctoral dissertation title

Monoclonal antibody for reducing the risk of respiratory syncytial virus infection in children: Cochrane systematic review

Mentor **Full Professor Bruno Baršić, MD, PhD** Year of enrollment in the TRIBE program **2010/2011** The full dissertation is available in **TRIBE's repository** pdf

Tea Andabaka defended her doctoral dissertation on April 12, 2013, at the TRIBE postgraduate doctoral program. This was the first dissertation defended in Croatia based on the Cochrane systematic review model.



Andrija Babić and his mentor, Livia Puljak

Babić Andrija

Doctoral dissertation title

Risk of bias assessment and its use in sensitivity analysis in Cochrane systematic reviews

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Andrija Babić defended his doctoral dissertation on February 25, 2021, at the TRIBE postgraduate doctoral program. His dissertation is based on the Scandinavian model.

Articles published from the doctoral dissertation

1. Andabaka T, Nickerson JW, Rojas-Reyes MX, Rueda JD, Bacic Vrca V, Barsic B. Monoclonal antibody for reducing the risk of respiratory syncytial virus infection in children. Cochrane Database of Systematic Reviews 2013;4: CD006602. (JIF: 5.912)

Articles published from the doctoral dissertation

1. Babic A, Vuka I, Saric F, Proloscic I, Slapnicar E, Cavar J, Poklepovic Pericic T, Pieper D, Puljak L. Overall bias methods and their use in sensitivity analysis of Cochrane reviews were not consistent. Journal of Clinical Epidemiology. 2020;119:57-64. (JIF: 4.952)

2. Babic A, Tokalic R, Amilcar Silva Cunha J, Novak I, Suto J, Vidak M, Miosic I, Vuka I, Poklepovic Pericic T, Puljak L. Assessments of attrition bias in Cochrane systematic reviews are highly inconsistent and thus hindering trial comparability. BMC Medical Research Methodology. 2019;19(1):76. (JIF: 3.031)

3. Babic A, Tokalic R, Amilcar Silva Cunha J, Novak I, Suto J, Vidak M, Miosic I, Vuka I, Poklepovic Pericic T, Puljak L. Assessments of attrition bias in Cochrane systematic reviews are highly inconsistent and thus hindering trial comparability. BMC Medical Research Methodology. 2019;19(1):76. (JIF: 3.031)


Marija Baković and her mentor Katarina Vukojević

Baković Marija

Doctoral dissertation title

Cardiac innervation in rats with experimentally induced diabetes type I

Mentor Full Professor Katarina Vukojević, MD, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Marija Baković (née Ćaran) defended her doctoral dissertation on September 13, 2018, at the TRIBE postgraduate doctoral program.



Adriana Banožić and her mentor Damir Sapunar

Banožić Adriana

Doctoral dissertation title

Behavioral changes following experimentally-induced acute myocardial infarction in rats

Mentor **Full professor Damir Sapunar, MD, PhD.** Year of enrollment in the TRIBE program **2010/2011** The full dissertation is available in **TRIBE's repository** pdf

Adriana Banožić defended her doctoral dissertation on April 24, 2014, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Bakovic M, Filipovic N, Ferhatovic Hamzic L, Kunac N, Zdrilic E, Vitlov Uljevic M, Kostic S, Puljak L, Vukojevic K. Changes in neurofilament 200 and tyrosine hydroxylase expression in the cardiac innervation of diabetic rats during aging. Cardiovascular Pathology. 2018;32:38-43.(JIF: 2.35)

2. Bakovic M, Juric Paic M, Zdrilic E, Vukojevic K, Ferhatovic L, Marin A, Filipovic N, Grkovic I, Puljak L. Changes in cardiac innervation during maturation in long-term diabetes. Experimental Gerontology. 2013;48(12):1473-8. (JIF: 3.34)

Article published from the doctoral dissertation

1. Banozic A, Grkovic I, Puljak L, Sapunar D. Behavioral changes following experimentally-induced acute myocardial infarction in rats. International Heart Journal. 2014;55(2):169-77. (JIF: 1.233)



Ognjen Barčot and his mentor Livia Puljak

Barčot Ognjen

Doctoral dissertation title

Adequacy of risk of bias assessment in surgical vs non-surgical trials in Cochrane reviews

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2018/2019 The full dissertation is available in TRIBE's repository pdf

Ognjen Barčot defended his doctoral dissertation on February 25, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Barcot O, Boric M, Poklepovic Pericic T, Cavar M, Dosenovic S, Vuka I, Puljak L. Risk of bias judgments for random sequence generation in Cochrane systematic reviews were frequently not in line with Cochrane Handbook. BMC Medical Research Methodology. 2019;19(1):170. (JIF: 4.615)

 Barcot O, Dosenovic S, Boric M, Pericic TP, Cavar M, Jelicic Kadic A, Puljak L. Assessing risk of bias judgments for blinding of outcome assessors in Cochrane reviews. Journal of Comparative Effectiveness Research. 2020;9(8):585-593. (JIF: 1.468)

3. Barcot O, Boric M, Dosenovic S, Poklepovic Pericic T, Cavar M, Puljak L. Risk of bias assessments for blinding of participants and personnel in Cochrane reviews were frequently inadequate. Journal of Clinical Epidemiology. 2019;113:104-113. (JIF: 4.952)

4. Barcot O, Boric M, Dosenovic S, Cavar M, Jelicic Kadic A, Poklepovic Pericic T, Vukicevic I, Vuka I, Puljak L. Adequacy of risk of bias assessment in surgical vs non-surgical trials in Cochrane reviews: a methodological study. BMC Medical Research Methodology. 2020;20(1):240. (JIF: 4.615)

5. Barcot O, Boric M, Dosenovic S, Puljak L. Assessing the risk of performance and detection bias in Cochrane reviews as a joint domain is less accurate compared to two separate domains. BMC Medical Research Methodology. 2021;21(1):149. (JIF: 4.615)



Željana Bašić and her mentor Šimun Anđelinović

Bašić Željana

Doctoral dissertation title

Determination of anthropological measurements and their rations that are significant for sex determination on skeletal remains from medieval population of Eastern Adriatic Coast

Mentor Full Professor Šimun Anđelinović, MD, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Željana Bašić (née Drnasin) defended her doctoral dissertation on January 13, 2015, at the TRIBE postgraduate doctoral program.

Article published from the doctoral dissertation

1. Bašić Ž, Anterić I, Vilović K, Petaros A, Bosnar A, Madžar T, Polašek O, Anđelinović Š. Sex determination in skeletal remains from the medieval Eastern Adriatic coast – discriminant function analysis of humeri. Croatian Medical Journal. 2013;54(3):272-8. (JIF: 1.343)



Marina Biočić and her mentor Livia Puljak

Katarina Borić and her mentor Snježana Mardešić

Biočić Marina

Doctoral dissertation title

Information sources and reproducibility of search strategies in systematic reviews in the field of anesthesiology and pain

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2017/2018 The full dissertation is available in TRIBE's repository pdf

Marina Biočić defended her doctoral dissertation on February 14, 2020, at the TRIBE postgraduate doctoral program.

Borić Katarina

Doctoral dissertation title

Expression of apoptotic and proliferative factors in the gastric mucosa of patients with systemic sclerosis

Mentor Full Professor Snježana Mardešić, MD, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Katarina Borić defended her doctoral dissertation on January 27, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Biocic M, Fidahic M, Cikes K, Puljak L. Comparison of information sources used in Cochrane and non-Cochrane systematic reviews: a case study in the field of anesthesiology and pain. Research Synthesis Methods. 2019;10(4):597-605.(JIF: 5.043)

2. Biocic M, Fidahic M, Puljak L. Reproducibility of search strategies of non-Cochrane systematic reviews published in anaesthesiology journals is suboptimal: primary methodological study. British Journal of Anaesthesia. 2019;22(6):e79-e81. (JIF: 6.199)

Article published from the doctoral dissertation

1. Boric K, Mardesic S, Martinovic Kaliterna D, Radic M, Tadin Hadjina I, Vukojevic K, Kosovic I, Solic I, Zekic Tomas S, Saraga-Babic M. Expression of apoptotic and proliferation factors in gastric mucosa of patients with systemic sclerosis correlates with form of the disease. Scientific Reports. 2019;9(1):18461. (JIF: 4.011)



Krste Borić and his mentor Livia Puljak

Matija Borić and his mentor Livia Puljak

Borić Krste

Doctoral dissertation title

Interventions for treating postoperative pain in children: analysis of evidence about efficacy, safety and outcome domains

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2015/2016 The full dissertation is available in TRIBE's repository pdf

Krste Borić defended his doctoral dissertation on October 6, 2018, at the TRIBE postgraduate doctoral program. His dissertation is based on the Scandinavian model.

Articles published from the doctoral dissertation

1. Boric K, Dosenovic S, Jelicic Kadic A, Batinic M, Cavar M, Urlic M, Markovina N, Puljak L. Interventions for postoperative pain in children: An overview of systematic reviews. Paediatric Anaesthesia. 2017;27(9):893-904. (JIF: 2.389)

2. Boric K, Dosenovic S, Jelicic Kadic A, Boric M, Jeric M, Puljak L. Efficacy and Safety Outcomes in Systematic Reviews of Interventions for Postoperative Pain in Children: Comparison Against the Recommended Core Outcome Set. Pain Medicine. 2018;19(11):2316-2321. (JIF: 2.782)

Boric K, Jelicic Kadic A, Boric M, Zarandi-Nowroozi M, Jakus D, Cavar M, Dosenovic S, Jeric M, Batinic M, Vukovic I, Puljak L. Outcome domains and pain outcome measures in randomized controlled trials of interventions for postoperative pain in children and adolescents. European Journal of Pain. 2019;23(2):389-396. (JIF: 2.991)

 Boric K, Boric M, Dosenovic S, Jelicic Kadic A, Batinic M, Cavar M, Jeric M, Puljak L. Authors' lack of awareness and use of core outcome set on postoperative pain in children is hindering comparative effectiveness research. Journal of Comparative Effectiveness Research. 2018;7(5):463-470. (JIF: 1.906)

Borić Matija

Doctoral dissertation title

The expression of calcium/calmodulindependent protein kinase II in nociceptive pathway from periphery to central nervous system in a model of diabetes

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Matija Borić defended his doctoral dissertation on March 2, 2015, at the TRIBE postgraduate doctoral program. His dissertation is based on the Scandinavian model.

Articles published from the doctoral dissertation

 Boric M, Jelicic Kadic A, Ferhatovic L, Sapunar D, Puljak L Calcium/calmodulin-dependent protein kinase II in dorsal horn neurons in long-term diabetes. NeuroReport. 2013;24:992-6. (JIF: 1.644)
Boric M, Jelicic Kadic A, Puljak L. The expression of calcium/calmodulin-dependent protein kinase II in dorsal horn of rats with type 1 and type 2 diabetes. Neuroscience Letters. 2014;51:9:151-6. (JIF: 2.055)
Boric M, Jelicic Kadic A, Puljak L. Cutaneous expression of calcium/calmodulin dependent protein kinase II in rats with type 1 and type 2 diabetes. Journal of Chemical Neuroanatomy. 2014;61:620:140-146. (JIF: 2.505)



Dissertation defense via Skype during the COVID-19 pandemic. Dina Bošnjak Kuharić, her mentor Martina Rojnić Kuzman, and committee members.

Bošnjak Kuharić Dina

Doctoral dissertation title

Facial emotional recognition in patients with first-episode psychosis

Mentor Full Professor Martina Ronjić Kuzman, MD, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Dina Bošnjak Kuharić (née Bošnjak) defended her doctoral dissertation on June 5, 2020, at the TRIBE postgraduate doctoral program.



Luka Brčić and his mentor Vesna Boraska Perica

Brčić Luka

Doctoral dissertation title

Hashimoto's thyroiditis: identification of genetic variants involved in development of disease

Mentor Full Professor Vesna Boraska Perica, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Luka Brčić defended his doctoral dissertation on December 18, 2018, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Rojnic Kuzman M*, Bośnjak Kuharic D*, Kekin I, Makaric P. Madzarac Z, Koricancic Makar A, Kudlek Mikulic S, Bajic Z, Bistrovic P, Bonacin D, Vogrinc Z. Effects of Long-Term Multimodal Psychosocial Treatment on Antipsychotic-Induced Metabolic Changes in Patients With First Episode Psychosis. Frontiers in Psychiatry 2018;16:9:488. (JIF: 3.161) («shared first autorship)

 Bosnjak Kuharic D, Makaric P, Kekin I, Lukacevic Lovrencic I, Savic A, Ostojic D, Silic A, Brecic P, Bajic Z, Rojnic Kuzman M. Differences in Facial Emotional Recognition Between Patients With the First-Episode Psychosis, Multi-episode Schizophrenia, and Healthy Controls. Journal of the International Neuropsychological Society. 2019;25(2):165-173. (JIF: 3.098) Articles published from the doctoral dissertation

Brčić L, Barić A, Graćan S, Brekalo M, Kaličanin D, Gunjača I, Torlak Lovrić V, Tokić S, Radman M, Škrabić V, Miljković A, Kolići I, Štefanić M, Glavaš-Obrovac Lj, Lessel D, Polašek O, Zemunik T, Barbalić M, Punda A, Boraska Perica V. Genome-wide association analysis suggests novel loci for Hashimoto's thyroiditis. Journal of Endocrinological Investigation. 2019;42(5):567-576. (JIF: 3.166)

 Brčić L, Barić A, Gračan S, Brdar D, Torlak Lovrić V, Vidan N, Zemunik T, Polašek O, Barbalić M, Punda A, Boraska Perica V. Association of established thyroid peroxidase autoantibody (TPOAb) genetic variants with Hashimoto's thyroiditis. Autoimmunity 2016;49(7):480-48. (JIF: 2.648)



Tonći Brković and his mentor Livia Puljak

Josipa Bukić and her mentor Darko Modun

Brković Tonći

Doctoral dissertation title

Pain in patients on hemodialysis: prevalence and associated factors

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Tonći Brković defended his doctoral dissertation on June 29, 2018, at the TRIBE postgraduate doctoral program.

Bukić Josipa

Doctoral dissertation title

The role of a pharmacist in the safe and effective usage of herbal products

Mentor **Full Professor Darko Modun, MD, PhD** Year of enrollment in the TRIBE program **2016/2017** The full dissertation is available in **TRIBE's repository** pdf

Josipa Bukić defended her doctoral dissertation on October 26, 2020, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Brković T, Burilović E, Puljak L. Risk factors associated with pain on chronic intermittent hemodialysis: a systematic review. Pain Practice. 2018;18(2):247-268. (JIF: 2.187)

2. Brković T, Burilović E, Puljak L. Prevalence and severity of pain in adult end-stage renal disease patients on chronic intermittent hemodialysis: a systematic review. Patient Preference and Adherence. 2016;10:1131-50. (JIF: 1.733)

Articles published from the doctoral dissertation

 Bukić J, Rušić D, Božić J, Zekan L, Leskur D, Šešelja Perišin A, Modun D. Differences among health care students' attitudes, knowledge and use of dietary supplements: a cross-sectional study. Complementary Therapies in Medicine. 2018;41:35-40. (JIF: 2.063)

2. Bukić J, Rušić D, Mas P, Karabatić D, Božić J, Šešelja Perišin A, Leskur D, Krnić D, Tomić S, Modun D. Analysis of spontaneous reporting of suspected adverse drug reactions for non-analgesic over-the-counter drugs from 2008 to 2017. BMC Pharmacology and Toxicology. 2019;18;20(1):60. (JIF: 1.771)



Ivan Buljan and his mentor Ana Marušić

Buljan Ivan

Doctoral dissertation title

Interventions for improvement of understanding and critical assessment of evidence-based medicine

Mentor Full Professor Ana Marušić, MD, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Ivan Buljan defended his doctoral dissertation on June 17, 2019, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Buljan I, Malički M, Wager E, Puljak L, Hren D, Kellie F, West H, Alfirević Ž, Marušić A. No difference in knowledge obtained from infographic or plain language summary of a Cochrane systematic review: three randomized controlled trials. Journal of Clinical Epidemiology. 2018;97:86-94. (JIF: 4.245)

 Buljan I, Jerončić A, Malički M, Marušić M, Marušić A. How to choose evidence-based medicine knowledge test for medical students: Comparison of three knowledge measures. BMC Medical Education 2018;18:290. (JIF: 1.511)

3. Buljan I, Tokalić R, Marušić M, Marušić A. Health numeracy of medical studnets: cross-sectional and controlled before-and-after study. BMC Medical Education. 2019;19(1): 467. (JIF: 2.317)

 Buljan I, Tokalić R, Roguljić M, Zakarija-Grković I, Vrdoljak D, Milić P, Puljak L, Marušić A. Comparison of blogshots with plain language summaries of Cochrane systematic reviews: a qualitative study and randomized trial. Trials. 2020;21(1):426. (JIF: 1.975)

 Buljan I, Tokalić R, Rogulijć M, Zakarija-Grković I, Vrdoljak D, Milić P, Puljak L, Marušić A. Framing the numerical findings of Cochrane plain language summaries: two randomized controlled trials. BMC Medical Research Methodology. 2020;20(1):101. (JIF: 2.509)

 Buljan I, Marušić M, Tokalić R, Viđak M, Poklepović Peričić T, Hren H, Marušić A. Cognitive levels in testing knowledge in evidence-based medicine: a cross sectional study. BMC Medical Education 2021;21(1):25. (JIF: 2.235)



Ivana Bušelić Garber and her mentors Ivona Mladineo and Željka Trumbić

Bušelić Garber Ivana

Doctoral dissertation title

Prevalence of infectious nematode larvae Anisakis pegreffii (*Nematoda, Anisakidae*) in paratenic host (*Sardina pilchardus*) and molecular characterization of model accidental host response (*Rattus norvegicus*)

Mentors Full Professor Ivona Mladineo, PhD and Associate Professor Željka Trumbić, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Ivana Bušelić Garber (née Bušelić) defended her doctoral dissertation on April 18, 2019, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Buselić I, Trumbić Ž, Hrabar J, Vrbatović A, Bočina I, Mladineo I. Molecular and cellular response to experimental Anisakis pegreffii (Nematoda, Anisakidae) third-stage larval infection in rats. Frontiers in Immunology. 2018;9:2055. (JIF: 5.511)

 Buselić I, Botić A, Hrabar J, Stagličić N, Cipriani P, Mattiucci S, Mladineo I. Geographic and host size variations as indicators of Anisakis pegreffi infection in European pilchard (Sardina pilchardus) from the Mediterranean Sea: Food safety implications. International Journal of Food Microbiology. 2018;266:126-32. (JIF: 3.339)



Svietlana Došenović and her mentor Livia Puliak

Došenović Svjetlana

Doctoral dissertation title

Interventions for treating neuropathic pain: analysis of the highest level of evidence and methods for appraisal of interventions

Mentor Full Professor Livia Puliak, MD, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Svjetlana Došenović defended her doctoral dissertation on October 6, 2018, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model.

Articles published from the doctoral dissertation

Dosenovic S, Jelicic Kadic A, Miljanovic M, Biocic M, Boric K, Cavar M, Markovina N, Vucic K, Puljak L. Interventions for Neuropathic Pain: An Overview of Systematic Reviews, Anesthesia Analgesia. 2017:125(2):643-52, (JIF: 3.463)

Dosenovic S, Jelicic Kadic A, Jeric M, Boric M, Markovic D, Vucic K, Puljak L. Efficacy and Safety Outcome Domains and Outcome Measures in Systematic Reviews of Neuropathic Pain Conditions. Clinical Journal of Pain. 2018;34(7):674-84. (JIF: 3.209)

3. Dosenovic S, Jelicic Kadic A, Vucic K, Markovina N, Pieper D, Puljak L. Comparison of methodological quality rating of systematic reviews on neuropathic pain using AMSTAR and R-AMSTAR. BMC Medical Research Methodology. 2018;18(1):37. (JIF: 2.524)

Dosenovic S, Nikolic Z, Ivancev B, Jelicic Kadic A, Puljak L. Awareness and acceptability of IMMPACT core outcome set for chronic pain among surveyed neuropathic pain authors. Journal of Comparative Effectiveness Research. 2019;8(9):671-683. (JIF: 1.468)

Ferhatović Lejla

Doctoral dissertation title

Expression of calcium/calmodulindependent protein kinase II and pain-related behavior in rat models of type 1 and type 2

Mentor Full Professor Livia Puliak, MD, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Lejla Ferhatović defended her doctoral dissertation on April 12, 2013, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

Ferhatovic L, Banozic A, Kostic S, Kurir TT, Novak A, Vrdoljak L, Heffer M, Sapunar D, Puljak L. Expression of calcium/calmodulin-dependent protein kinase II and pain-related behavior in rat models of type 1 and type 2 diabetes. Anesthesia Analgesia. 2013:116(3):712-21. (JIF: 3.274) 2. Ferhatovic L, Banozic A, Kostic S, Sapunar D, Puljak L. Sex differences in pain-related behavior and

expression of calcium/calmodulin-dependent protein kinase II in dorsal root ganglia of rats with diabetes type 1 and type 2. Acta Histochemica. 2013;115(5):496-504. (JIF: 1.829)



159



Leila Ferhatović and her mentor Livia Puliak



Mirko Gabelica and his mentor Livia Puljak

Gabelica Mirko

Doctoral dissertation title

Data sharing practices among authors of biomedical publications

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2015/2016 The full dissertation is available in TRIBE's repository: (a disertation embargo is in place until all publications have been published)

Mirko Gabelica defended his doctoral dissertation on December 3, 2021, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Chantelle Marie Garritty after the teleconference defense of her doctoral dissertation

Garritty Chantelle Marie

Doctoral dissertation title

Facilitating the use and uptake of timely evidence from rapid reviews by policymakers and other healthcare stakeholders

Mentor Full Professor David Moher, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository odf

Chantelle Marie Garritty defended her doctoral dissertation on July 28, 2021, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model. The dissertation was written in English.

Articles published from the doctoral dissertation

1. Garritty C, Hersi M, Hamel C, Stevens A, Monfaredi Z, Butler C, Tricco AC, Hartling L, Stewart LA, Welch V, Thavorn K, Cheng W, Moher D. Assessing the format and content of journal published and non-journal published rapid review reports: a comparative study. PLoS One 2020;15(8):e0238025. (JIF: 2.740)

 Garritty C, Hamel C, Hersi M, Butler C, Monfaredi Z, Stevens A, Nussbaumer-Streit B, Cheng W, Moher D. Assessing how information is packaged in rapid reviews for policy-makers and other stakeholders: a cross-sectional study. Health Research Policy and Systems. 2020;18:112. (JIF: 2.365)

3. Garritty C, Norris SL, Moher D. Developing WHO rapid advice guidelines in the setting of a public health emergency. Journal of Clinical Epidemiology. 2017;82:47-60. (JIF: 4.667)

161

Articles published from the doctoral dissertation

 Gabelica M, Cavar J, Puljak L. Authors of trials from high-ranking anesthesiology journals were not willing to share raw data. Journal of Clinical Epidemiology. 2019;109:111-116. (JIF: 6.437)
Gabelica M, Bojčí R, Puljak L. Many researchers were not compliant with their published data sharing

statement: mixed-methods study. Journal of Clinical Epidemiology. 2022;S0895-4356(22)00141-X. (JIF: 6.437)



Andrea Gelemanović and her mentor Ozren Polašek

Gelemanović Andrea

Doctoral dissertation title

Host genetics in susceptibility to respiratory infectious diseases

Mentor **Full professor Ozren Polašek, MD, PhD.** Year of enrollment in the TRIBE program **2014/2015** The full dissertation is available in **TRIBE's repository** pdf

Andrea Gelemanović defended her doctoral dissertation on March 28, 2019, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Dissertation defense via the GoToMeeting teleconference software during the COVID-19 pandemic. Ketevan Glonti during the discussion with her doctoral defense committee members.

Glonti Ketevan

Doctoral dissertation title

Peer review content and communication process in biomedical journals

Double degree doctorate University of Split and University of Paris Mentor Full Professor Darko Hren, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Ketevan Glonti defended her doctoral dissertation on May 29, 2020, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model. The dissertation was written in English.

Articles published from the doctoral dissertation

 Patarčić I', Gelemanović A', Kirin M, Kolčić I, Theodoratou E, Baillie KJ, de Jong MD, Rudan I, Campbell H, Polašek O. The role of host genetic factors in respiratory tract infectious diseases: systematic review, meta-analyses and field synopsis. Scientific Reports. 2015;35:16119. (JH: 4.122) (+shared first autorship)
Gelemanović A, Dobberpuhl K, Krakar G, Patarčić I, Kolčić I, Polašek O. Host genetics and susceptibility to congenital and childhood cytomegalovirus infection: a systematic review. Croatian Medical Journal. 2016;57(4):321-30. (JH: 1.432) Articles published from the doctoral dissertation

1. Glonti K, Hren D. Editors' Perspectives on the Peer-Review Process in Biomedical Journals: Protocol for a Qualitative Study. BMJ Open. 2018;8(10):e020568. (JIF: 2.413)

2. Glonti K, Cauchi D, Cobo E, Boutron I, Moher D, Hren D. A Scoping Review Protocol on the Roles and Tasks of Peer Reviewers in the Manuscript Review Process in Biomedical Journals. BMJ Open. 2017;7(10):e017468. (JIF: 2.413)

 Glonti K, Cauchi D, Cobo E, Boutron I, Moher D, Hren D. A Scoping Review on the Roles and Tasks of Peer Reviewers in the Manuscript Review Process in Biomedical Journals. BMC Medicine. 2019;17(1):118. (JIF: 8.3)



Candyce Hamel and her doctoral defense commit tee during the defense held via teleconference



Doctoral dissertation title

Rapid reviews: defining, evaluating methods, and reducing screening burden using artificial intelligence

Mentor Full Professor Beverley Shea, PhD Year of enrollment in the TRIBE program 2018/2019 The full dissertation is available in TRIBE's repository pdf

Candyce Hamel defended her doctoral dissertation on July 28, 2021, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model. The dissertation was written in English.



Jerko Hrabar and his mentor Ivona Mladineo

Hrabar Jerko

Doctoral dissertation title

Characteristics of immune response of dolphin as a definitive and rat as an accidental host to *Anisakis spp.* Infection.

Mentor Full Professor Ivona Mladineo, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Jerko Hrabar defended his doctoral dissertation on July 25, 2019, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation:

1. Hamel C, Michaud A, Thuku M, Skidmore B, Stevens A, Nussbaumer-Streit B, Garritty C. Defining Rapid Reviews: a systematic scoping review and thematic analysis of definitions and defining characteristics of rapid reviews. Journal of Clinical Epidemiology. 2021;129:74-85. (JIF: 4,952)

2. Hamel C, Michaud A, Thuku M, Affengruber L, Skidmore B, Nussbaumer-Streit B, Stevens A, Garritty C. Few evaluative studies exist examining rapid review methodology across stages of conduct: a systematic scoping review. Journal of Clinical Epidemiology. 2020;126:131-140. (JJF: 4.952)

3. Hamel C, Kelly SE, Thavorn K, Rice DB, Wells GA, Hutton B. An evaluation of DistillerSR's machine learning-based prioritization tool for title/abstract screening — impact on reviewer-relevant outcomes. BMC Medical Research Methodology. 2020;20:256. (JIF:3.031) Articles published from the doctoral dissertation

 Hrabar J, Trumbić Ž, Bočina I, Bušelić I, Vrbatović A, Mladineo I. Interplay between proinflammatory cytokines, miRNA, and tissue lesions in Anisakis-infected Sprague-Dawley rats. PLoS Neglected Tropical Diseases. 2019;13(5):e0007397. (JIF: 4.487)

2. Hrabar J, Bočina I, Gudan Kurilj A, Đuras M, Mladineo I. Gastric lesions in dolphins stranded along the Eastern Adriatic coast. Diseases of Aquatic Organisms. 2017;125(2):125-139. (JIF: 1.549)



Antonia Jeličić Kadić and her mentor Livia Puljak

Milka Jerić and her mentor Natalija Filipović

Jeličić Kadić Antonia

Doctoral dissertation title

Treating pain with inhibitors of calcium/ calmodulin-dependent protein kinase II in a model of diabetic neuropathy

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Antonia Jeličić Kadić defended her doctoral dissertation on June 28, 2014, at the TRIBE postgraduate doctoral program.

Jerić Milka

Doctoral dissertation title

Immunohistochemical changes in rat trigeminal ganglia caused by diabetes mellitus type 1 and 2

Mentor Full Professor Natalija Filipović, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Milka Jerić defended her doctoral dissertation on December 22, 2015, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Jeličić Kadić A, Borić M, Kostić S, Sapunar D, Puljak L. The effects of intraganglionic injection of calcium/calmodulin-dependent protein kinase II inhibitors on pain-related behavior in diabetic neuropathy. Neuroscience. 2014;256:302-308. (JIF: 3.122)

2. Jeličić Kadić A, Borić M, Ferhatović L, Banožić A, Sapunar D, Puljak L. Intrathecal inhibition of calcium/ calmodulin-dependent protein kinase II in diabetic neuropathy adversely affects pain-related behavior. Neuroscience Letters. 2013;554:126-130. (JIF: 2.026)



Articles published from the doctoral dissertation

1. Jerić M, Vuica A, Borić M, Puljak L, Jeličić Kadić A, Grković I, Filipović N. Diabetes mellitus affects activity of calcium/calmodulin-dependent protein kinase II alpha in rat trigeminal ganglia. Journal of Chemical Neuroanatomy. 2015;64-65:12-9. (JIF: 1.500)

 Jerić M, Vukojević K, Vuica A, Filipović N. Diabetes mellitus influences the expression of NPY and VEGF in neurons of rat trigeminal ganglion. Neuropeptides. 2016;52:57-64. (JIF: 2.486)



Diana Jurić and her mentor Ana Marušić

Jurić Diana

Doctoral dissertation title

Transparency of clinical trials on drug-drug interaction registered in Clinical Trials.gov: reporting on adverse events and description of pharmacological intervention.

Mentor **prof. dr. sc. Ana Marušić, dr. med.** Year of enrollment in the TRIBE program **2015/2016** The full dissertation is available in **TRIBE's repository** pdf

Diana Jurić defended her doctoral dissertation on July 2, 2019, at the TRIBE postgraduate doctoral program.



Nikola Ključević and his mentor Ivica Grković

Ključević Nikola

Doctoral dissertation title

Wine as a modulator of the inflammatory phase of myocardial infarct healing in rats

Mentor Full Professor Ivica Grković, MD, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Nikola Ključević defended his doctoral dissertation on December 17, 2019, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Jurić D, Pranić S, Tokalić R, Milat AM, Mudnić I, Pavličević I, Marušić A. Clinical trials on drug-drug interactions registered in Clinical Trials.gov reported incongruent safety data in published articles: an observational study. Journal of Clinical Epidemiology. 2018;104:35-45. (JIF 2017: 4.245)
Jurić D, Bolić A. Pranić S. Marušić A. Drug-drug interaction trials incompletely described drug interventions in ClinicalTrials.gov and published articles: an observational study. Journal of Clinical Epidemiology. 2020;117:126-137. (JIF 2019: 4.952) Articles published from the doctoral dissertation

1. Ključević N, Milat AM, Grga M, Mudnić I, Boban M, Grković I. White Wine Consumption Influences Inflammatory Phase of Repair After Myocardial Infarction in Rats. Journal of Cardiovascular Pharmacology. 2017;70(5):293-299. (JIF: 2.094)

2. Ključević N, Boban D, Milat AM, Jurić D, Mudnić I, Boban M, Grković I. Expression of Leukocytes Following Myocardial Infarction in Rats is Modulated by Moderate White Wine Consumption. Nutrients. 2019;11(8). (JIF: 4.171)



Željko Ključević and his mentor Davorka Sutlović

Ključević Željko

Doctoral dissertation title

Heroin addicts in methadone maintenance program: Impact of liver damage on methadone concentration and its metabolite, the risk to overdose, and mortality

Mentor Associate Professor Davorka Sutlović, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Żeljko Ključević defended his doctoral dissertation on December 2, 2019, at the TRIBE postgraduate doctoral program.



Sandra Kostić and TRIBE directors, Damir Sapunar and Livia Puljak

Kostić Sandra

Doctoral dissertation title

Blockade of neuropeptide Y Y1 and Y2 receptors attenuates pain-related behavior in a rat model of neuropathic and inflammatory pain

Mentor Full Professor Damir Sapunar, MD, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Sandra Kostić defended her doctoral dissertation on March 13, 2013, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Ključević Ž, Benzon B, Ključević N, Veršić Bratinčević M, Sutlović D. Liver damage indices as a tool for modifying methadone maintenance treatment: a cross-sectional study. Croatian Medical Journal. 2018;59(6):298-306. (JIF: 1.624)

 Sutlović D', Kljućević Ž', Slišković L, Šušnjar H, Visković I, Definis-Gojanović M. Methadone Maintenance Treatment: A 15-year Retrospective Study in Split — Dalmatia County, Croatia. Therapeutic Drug Monitoring. 2018;40(4):486-494. (JIF: 2.047) (*shared first autorship) Articles published from the doctoral dissertation

 Kostić S, Puljak L, Sapunar D. Attenuation of pain-related behavior evoked by carrageenan injection through blockade of neuropeptide Y Y1 and Y2 receptors. European Journal of Pain. 2013;17(4):493-504. (JIF: 3.939)
Sapunar D, Vukojević K, Kostić S, Puljak L. Attenuation of pain-related behavior evoked by injury through blockade of neuropeptide Y Y2 receptor. Pain. 2011;152(5):1173-81. (JIF: 5.777)



Marina Krnić Martinić and her mentor Livia Puljak

Krnić Martinić Marina

Doctoral dissertation title

Effectiveness of educational intervention on improving knowledge about systematic reviews

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2018/2019 The full dissertation is available in TRIBE's repository: (a disertation embargo is in place until all publications have been published)

Marina Krnić Martinić defended her doctoral dissertation on December 3, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Krnić Martinić M, Pieper D, Glatt A, Puljak L. Definition of a systematic review used in overviews of systematic reviews, meta-epidemiological studies and textbooks. BMC Medical Research Methodology. 2019;19(1):203. (JIF: 4.402)

2. Krnić Martinić M, Meerpohl JJ, von Elm E, Herrle F, Marušić A, Puljak L. Attitudes of editors of core clinical journals about whether systematic reviews are original research: a mixed-methods study. BMJ Open. 2019;9(8):e029704. (JIF: 2.692)

3. Krnić Martinić M, Civljak M, Marušić A, Sapunar D, Poklepovic Pericic T, Buljan I, Tokalic R, Malisa S, Neuberg M, Ivanisevic K, Aranza D, Skitarelic N, Zoranic S, Miksic S, Cavic D, Puljak L. Web-based educational intervention to improve knowledge of systematic reviews among health science professionals: randomized controlled trial. Journal of Medical Internet Research. 2022;24(8):e37000. (JIF: 7.08)

 Krnić Martinić M, Mališa S, Aranza D, Čivljak M, Marušić A, Sapunar D, Poklepović Peričić T, Buljan I, Tokalić R, Čavić D, Puljak L. Creating an online educational intervention to improve knowledge about systematic reviews among healthcare workers: mixed-methods pilot study. BMC Medical Education. 2022;22:722. (JIF: 3.263)



Dario Leskur during the teleconference presentation of his doctoral dissertation defended during the COVID-19 pandemic.

Leskur Dario

Doctoral dissertation title

Sodium lauryl sulphate induced irritation as human in vivo irritant contact dermatitis model

Mentor Full Professor Darko Modun, MD, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Dario Leskur defended his doctoral dissertation on October 23, 2020, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Leskur D, Bukic J, Petric A, Zekan L, Rusic D, Seselja Perisin A, Petric I, Stipic M, Puizina-Ivic N, Modun D. Anatomical Site Differences of Sodium Laurylsulphate Induced Irritation: randomised controlled trial. British Journal of Dermatology. 2019;181(1):175-85. (JIF: 7.000)

 Leskur D, Perisic I, Romac K, Susak H, Seselja Perisin A, Bukic J, Rusic D, Kladar N, Bozin B, Modun D. Comparison of mechanical, chemical and physical human models of in vivo skin damage: randomized controlled trial. Skin Research and Technology. 2021;27(2):208-216. (JIF: 2.079)



Mladen Lešin and his mentor Livia Puljak

Lešin Mladen

Doctoral dissertation title

Factors associated with postoperative pain and consumption of analgesics in ophthalmic surgery

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program2013/2014 The full dissertation is available in TRIBE's repository pdf

Mladen Lešin defended his doctoral dissertation on July 28, 2015, at the TRIBE postgraduate doctoral program.



Linda Luŝić Kalcina and her mentor Zoran Đogaš. Dissertation defense via Skype during the COVID-19 pandemic

Lušić Kalcina Linda

Doctoral dissertation title

Association of polysomnographic data in OSA patients with psychomotor abilities and sleep quality assessment

Mentor Full Professor Zoran Đogaš, MD, PhD Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Linda Kalcina (nee Lušić) defended her doctoral dissertation on April 3, 2020, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

- 1. Leśin M, Domazet Bugarin J, Puljak L. Factors associated with postoperative pain and analgesic consumption in ophthalmic surgery: a systematic review. Survey of Ophthalmology. 2015;60(3):196-203. (JIF: 3.849)
- 2. Lešin M, Šundov Ž, Jukić M, Puljak L. Postoperative Pain in Complex Ophthalmic Surgical Procedures: Comparing Practice with Guidelines. Pain Medicine. 2014;15(6):1036-42. (JIF: 2.300)

 Lešin M, Džaja Lozo M, Duplančić-Šundov Z, Džaja I, Davidović N, Banožić A, Puljak L. Risk factors associated with postoperative pain after ophthalmic surgery: a prospective study. Therapeutics and Clinical Risk Management. 2016;12:93-102. (JIF: 1.995) Articles published from the doctoral dissertation

 Lušić Kalcina L, Pavlinac Dodig I, Pecotić R, Valić M, Đogaš Z. Psychomotor Performance in Patients with Obstructive Sleep Apnea Syndrome. Nature and Science of Sleep. 2020;12:183-195. (JIF: 3.054)
Lušić Kalcina L, Valič M, Pecotić R, Pavlinac Dodig I, Đogaš Z. Good and poor sleepers among OSA patients: sleep quality and overnight polysomnography findings. Neurological Sciences. 2017;38(7):1299-1306. (JIF: 2.484)



Mario Malički and his mentor Ana Marušić

Malički Mario

Doctoral dissertation title

Integrity of scientific publications in biomedicine

Mentor **Full professor Ana Marušić, MD, PhD.** Year of enrollment in the TRIBE program **2012/2013** The full dissertation is available in **TRIBE's repository** pdf

Mario Malički defended his doctoral dissertation on December 3, 2015, at the TRIBE postgraduate doctoral program. His dissertation is based on the Scandinavian model.



Filipa Markotić and her mentor Livia Puljak

Markotić Filipa

Doctoral dissertation title

Sharing prescription analgesics: perception of risk, frequency and associated factors

Mentor Full professor Livia Puljak, MD, PhD. Year of enrollment in the TRIBE program 2017/2018 The full dissertation is available in TRIBE's repository pdf

Filipa Markotić defended her doctoral dissertation on April 16, 2018, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model.

Articles published from the doctoral dissertation

1. Malički M, Jerončić A, Marušić M, Marušić A. Why do you think you should be the author on this manuscript? Analysis of open-ended responses of authors in a general medical journal. BMC Medical Research Methodology. 2012;12:189. (JIF: 2.668)

 Malički M, von Elm E, Marušić A. Study design, publication outcome, and funding of research presented at the International Congresses on Peer Review and Biomedical Publication. JAMA. 2014;311:1065-1067. (JIF: 30.387)

3. Malički M, Marušić A, OPEN Consortium. Is there a solution to publication bias? Researchers call for changes in dissemination of clinical research results. Journal of Clinical Epidemiology. 2014;67:1103-10. (JIF: 5.478)

Articles published from the doctoral dissertation

1. Markotić F, Puljak L. Risks associated with borrowing and sharing of prescription analgesics among patients observed by pain management physicians in Croatia: a qualitative study. Journal of Pain Research. 2016;9:1143-1151. (JIF: 2.581)

2. Markotić F, Vrdoljak D, Puljiz M, Puljak L. Risk perception about medication sharing among patients: a focus group qualitative study on borrowing and lending of prescription analgesics. Journal of Pain Research. 2017;10:365-374. (JIF: 2.581)

 Markotić F, Jurišić D, Čurković M, Puljiz M, Novinšćak M, Bonassin M, Vrdoljak D, Vojvodić Z, Permozer Hajdarević S, Pekez-Pavlisko T, Tomičić M, Diminić-Lisica I, Fabris Ivšić S, Nejašmić D, Miošić I, Novak I, Puljak L. Sharing of prescription analgesics among patients in family practice. Frequency and associated factors. European Journal of Pain. 2018;22(4):716-727. (JIF: 3.019)



Domagoj Marković and members of doctoral defense committee — Davor Eterović, Ivan Pećin and Darija Baković Kramarić

Marković Domagoj

Doctoral dissertation title

Effects of carvedilol therapy in patients with heart failure with mid-range and preserved ejection fraction

Mentor Full Professor Duška Glavaš, MD, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Domagoj Marković defended his doctoral dissertation on November 15, 2019, at the TRIBE postgraduate doctoral program.



Angela Mastelić and her mentor Anita Markotić

Mastelić Angela

Doctoral dissertation title

Expression of adhesion molecules on granulocytes and monocytes after myocardial infarction in rats who consumed white wine and on the cancer cell lines after treatment with the inhibitor of phospholipase C

Mentor Full Professor Anita Markotić, PhD Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Angela Mastelić defended her doctoral dissertation on July 2, 2020, at the TRIBE postgraduate doctoral program.

Article published from the doctoral dissertation

1. Marković D, Jurčević Zidar B, Macanović J, Milićić D, Glavaš D. Effects of carvedilol therapy in patients with heart failure with preserved ejection fraction — Results from the Croatian heart failure (CRO-HF) registry. Medicina clinica (Barc). 2019;152(2):43-49. (JIF: 1.168)

Articles published from the doctoral dissertation

1. Režić-Mužinić N*, **Mastelić A***, Benzon B*, Markotić A, Mudnić I, Grković I, Boban M. Expression of adhesion molecules on granulocytes and monocytes following myocardial infarction in rats drinking white wine. PLoS One. 2018;13(5):e0196842. (JIF: 2.776) (*shared first autorship)

 Mastelić A, Čikeš Čulić V, Režić Mužinić N, Vuica-Ross M, Barker D, Leung EY, Markotić A. Glycophenotype of breast and prostate cancer stem cells treated with thieno[2,3-b]pyridine anticancer compound. Drug design, development and therapy. 2016;11:759-769. (JIF: 3.028)



Antonela Matana and her mentor Tatijana Zemunik

Matana Antonela

Doctoral dissertation title

Identification of genetic and environmental factors implicated in regulation of thyroid and parathyroid function

Mentor Full Professor Tatijana Zemunik, MD, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Antonela Matana (née Boljat) defended her doctoral dissertation on December 21, 2018, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model.



Zoran Meŝtrović, his mentor Damir Roje, and the committee members during the defense held via teleconference in the midst of the COVID-19 pandemic.

Meštrović Zoran

Doctoral dissertation title

Calculation of optimal weight gain during pregnancy in relation to a woman's height

Mentor Full Professor Damir Roje, MD, PhD Year of enrollment in the TRIBE program 2017/2018 The full dissertation is available in TRIBE's repository pdf

Zoran Meštrović defended his doctoral dissertation on July 21, 2020, at the TRIBE postgraduatedoctoral program.

Articles published from the doctoral dissertation

1. Matana A, Brdar D, Torlak V, Boutin T, Popović M, Gunjača I, Kolčić I, Boraska Perica V, Punda A, Polašek O, Barbalić M, Hayward C, Zemunik T. Genome-wide meta-analysis identifies novel loci associated with parathyroid hormone level. Molecular Medicine. 2018; 24(1):15. (JIF: 3.457)

 Matana A, Popović M, Boutin T, Torlak V, Brdar D, Gunjača I, Kolčić I, Boraska Perica V, Punda A, Polašek O, Hayward C, Barbalić M, Zemunik T. Genome-wide meta-analysis identifies novel gender specific loci associated with thryroid antibodies level in Croatians. Genomics. 2019;111(4):737-743. (JIF: 2.801)
Matana A, Torlak V, Brdar D, Popović M, Lozić B, Barbalić M, Perica VB, Punda A, Polašek O, Hayward C, Zemunik T. Dietary Factors Associated with Plasma Thyroid Peroxidase and Thyroglobulin Antibodies. Nutrients. 2017;9(11):1186. (JIF: 3.550)

Articles published from the doctoral dissertation

1. Mestrović Z, Roje D, Vulić M, Zec M. Calculation of optimal gestation weight gain in pre-pregnancy underweight women due to body mass index change in relation to mother's height. Archives of Gynecology and Obstetrics. 2017;295(1):81-86. (JIF: 2.283)

 Meštrović Z, Roje D, Relja A, Kosović I, Aračić N, Vulić M, Polašek O. Maternal body mass index change as a new optimal gestational weight gain predictor in overweight women. Croatian Medical Journal. 2019;60(6):508-514. (JIF: 1.619)





Ana Marija Milat and her mentor Ivana Mudnić

Milat Ana Marija

Doctoral dissertation title

Effects of white wine on rats weight and in vitro antioxidant and vasodilatory activity

Mentor Full Professor Ivana Mudnić, MD, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Ana Marija Milat defended her doctoral dissertation on May 30, 2019, at the TRIBE postgraduate doctoral program.



Mentor Full Professor Peter Tugwell, PhD Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Lara Jane Maxwell defended her doctoral dissertation on June 13, 2016, at the TRIBE postgraduate doctoral program. The dissertation was written in English.

Articles published from the doctoral dissertation

1. Milat AM, Mudnić I, Grković I, Ključević N,Grga M, Jerčić I, Jurić D, Ivanković D, Benzon B, Boban M. Effects of White Wine Consumption on Weight in Rats: Do Polyphenols Matter? Oxidative Medicine and Cellular Longevity. 2017;2017;8315803. (JIF: 4.936)

2. Milat AM, Boban M, Teissedre PL, Šešelja Perišin A, Skroza D, Generalić-Mekinić I, Ljubenkov I, Volarević J, Resines-Perea Z, Jourdes M, Mudnić I. Effects of oxidation and browning of macerated white wine on its antioxidant and direct vasodilatory activity. Journal of Functional Foods. 2019;59:138-147. (JIF: 3.470)

Articles published from the doctoral dissertation

1. Maxwell LJ, Wells GA, Simon LS, Conaghan PG, Grosskleg S, Scrivens K, Beaton DE, Bingham CO 3rd, Busse JW, Christensen R, Goel N, Jüni P, Kaiser U, Lyddiatt A, Mease PJ, Ostelo RW, Phillips K, Sapunar D, Singh JA, Strand V, Taylor AM, Terwee CB, Tugwell P. Current State of Reporting Pain Outcomes in Cochrane Reviews of Chronic Musculoskeletal Pain Conditions and Considerations for an OMERACT Research Agenda. Journal of Rheumatology. 2015;42(10):1934-1942. (JIF: 3.187)

 Maxwell LJ, Singh JA. Abatacept for rheumatoid arthritis. Cochrane Database of Systematic Reviews. 2009;(4):CD007277. (JIF: 5.653)

Lara Jane Maxwell and TRIBE's program directors, Damir Sapunar and Livia Puljak

Maxwell Lara Jane

Doctoral dissertation title

Achieving consensus on pain outcome measures in systematic reviews of chronic musculoskeletal conditions: the current state of reporting and identifying key topics for consideration





Sanda Mustapić and dissertation defense commit tee members: Zoran Đogaš, Mirna Saraga Babić, and Mladen Boban

Mustapić Sanda

Doctoral dissertation title

The effects of mu-opioid receptor agonists on respiratory neurons in the pre-Botzinger complex in decerebrate dogs

Mentor Full professor Edward J. Zuperku Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Sanda Mustapić defended her doctoral dissertation on April 5, 2013, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Jennifer Petkovic and dissertation defense committee members: Ozren Polašek, Livia Puljak, and Davor Štimac

Petkovic Jennifer

Doctoral dissertation title

User testing and evaluation of evidence for equity: systematic review summaries for policy makers

Mentor **Full professor Peter Tugwell** Year of enrollment in the TRIBE program **2012/2013** The full dissertation is available in **TRIBE's repository** pdf

Jennifer Petkovic (née O'Neill) defended her doctoral dissertation on July 11, 2017, at the TRIBE postgraduate doctoral program. The dissertation was written in English.

Articles published from the doctoral dissertation

 Mustapić S, Radočaj T, Sanchez A, Dogaš Z, Stucke AG, Hopp FA, Stuth EA, Zuperku EJ. Clinically relevant infusion rates of mu-opioid agonist remifentanil cause bradypnea in decerebrate dogs but not via direct effects in the pre-Botzinger complex region. Journal of Neurophysiology. 2010;103(1):409-18. (JIF: 3.316)
Prkić I, Mustapić S, Radočaj T, Stucke AG, Stuth EA, Hopp FA, Dean C, Zuperku EJ. Pontine mu-opioid receptors mediate bradypnea caused by intravenous remifentanil infusion at clinically relevant concentrations in dogs. Journal of Neurophysiology. 2012;108(9):2430-41. (JIF: 3.316)

Articles published from the doctoral dissertation

 O'Neill J, Tabish H, Welch W, Patticrew M, Pottie K, Clarke M, Evans T, Pardo JP, Walters E, White H, Tugwall P. Applying an equity lens to interventions: using PROGRESS ensures consideration of socially stratifying factors to illuminate inequities in health. Journal of Clinical Epidemiology. 2014;67(1):56-64. (JIF: 4.703)
Petković J, Welch W, Jacob MH, Yoganathan M, Ayala AP, Cunningham H, Tugwell P. The effectiveness of evidence summaries on health policymakers and health system managers use of evidence from systematic review: a systematic review. Implementation Science. 2016;11(1):162. (JIF: 3.201)



Tina Poklepović Peričić and her mentor Dario Sambunjak

Poklepović Peričić Tina

Doctoral dissertation title

Devices for interdental cleaning in the prevention of periodontal diseases and dental caries: Cochrane systematic reviews

Mentor Full Professor Dario Sambunjak, MD, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Tina Poklepović Peričić defended her doctoral dissertation on May 12, 2015, at the TRIBE postgraduate doctoral program.



Shelly Pranić and her mentor Ana Marušić

Pranić Shelly

Doctoral dissertation title

Adequacy of registration and results reporting of randomized controlled trials in clinicaltrials.gov and publications

Mentor Full Professor Ana Marušić, MD, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Shelly Pranic defended her doctoral dissertation on September 16, 2016, at the TRIBE postgraduate doctoral program. The dissertation was written in English.

Articles published from the doctoral dissertation

1. Poklepović T, Worthington HV, Johnson TM, Sambunjak D, Imai P, Clarkson JE, Tugwell P. Interdental brushing for the prevention and control of periodontal diseases and dental caries in adults. Cochrane Database of Systematic Reviews 2013;12:CD009857. (JIF: 5.939)

2. Sambunjak D, Nickerson JW, **Poklepović T**, Johnson TM, Imai P, Tugwell P, Worthington HV. Flossing for the management of periodontal diseases and dental caries in adults. Cochrane Database of Systematic Reviews 2011;12:CD008829. (JIF: 5.939)

Article published from the doctoral dissertation

1. Pranic S, Marušić A. Changes to registration elements and results in a cohort of Clinicaltrials.gov trials were not reflected in published articles. Journal of Clinical Epidemiology. 2016;70:26-37. (JIF: 4.703)



Ivana Prkić and doctoral defense committee members Mihajlo Lojpur, Renata Pecotić, and Daniel Pravdić

Prkić Ivana

Doctoral dissertation title

The effect of µ-opioid receptor agonists and antagonists in the pontine parabrachial nucleus on breathing patterns of decerebrate canines

Mentor Full Professor Edward J. Zuperku, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Ivana Prkić defended her doctoral dissertation on May 11, 2015, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Drita Puharić and her mentor Irena Zakarija Grković

Puharić Drita

Doctoral dissertation title

The effect of a combined intervention on exclusive breastfeeding in primiparas: A randomized controlled trial

Mentor Assist. prof. Irena Zakarija Grković, MD, PhD. Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Drita Puharić defended her doctoral dissertation on August 28, 2020, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Prkić I, Mustapić S, Radočaj T, Stucke AG, Stuth EA, Hopp FA, Dean C, Zuperku EJ. Pontine µ-opioid receptors mediate bradypnea caused by intravenous remifentanii Infusions at clinically relevant concentrations in dogs. Journal of Neurophysiology. 2012;108(9):2430-41. (JIF: 3,041)
Stucke AG, Miller JR, Prkić I, Zuperku EJ, Hopp FA, Stuth EA. Opioid-induced respiratory depression is only partially mediated by the preBotzinger complex in young and adult rabbits in vivo. Anesthesiology. 2015; 122(6):1288-1298. (JIF: 6.168) Articles published from the doctoral dissertation

1. Puharić D, Malički M, Borovac JA, Šparac V, Poljak B, Aračić N, Marinović N, Luetić N, Zakarija-Grković I. The effect of a combined intervention on exclusive breastfeeding in primiparas: A randomised controlled trial. Maternal & Child Nutrition. 2020;16(3):e12948. (JIF: 2.789)

2. Zakarija-Grković I, **Puharić D**, Malički M, Hoddinott P. Breastfeeding booklet and proactive phone calls for increasing exclusive breastfeeding rates: RCT protocol. Maternal & Child Nutrition. 2017;13(1):e12249. (JIF: 2.789)



Ivana Restović and her mentor Ivana Bočina

Eduard Rod and director of the TRIBE program Damir Sapunar

Restović Ivana

Doctoral dissertation title

Immunohistochemical studies of cytoskeletal and extracellular matrix components in dogfish *Scyliorhinus canicula L. notochordal cells.*

Mentor Full Professor Ivana Bočina, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Ivana Restović (ex Dujmović) defended her doctoral dissertation on September 17, 2015, at the TRIBE postgraduate doctoral program.

Rod Eduard

Doctoral dissertation title

Optimization of an ex vivo gene transfer to the hamstrings tendons muscle remnants: potential for genetic enhancement of bone healing

Mentor Full Professor Alan Ivković, MD, PhD Year of enrollment in the TRIBE program 2010/2011 The full dissertation is available in TRIBE's repository pdf

Eduard Rod defended his doctoral dissertation on March 4, 2020, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Restović I, Vukojević K, Paladin A, Saraga-Babić M, Bočina I. Immunohistochemical studies of cytoskeletal and extracellular matrix components in dogfish Scyliorhinus canicula L. notochordal cells. Anatomical Record (Hoboken). 2015;298(10):1700-9. (JIF: 1.507)
Vukušić Pušić T, Janjić T, Dujmović I, Poljićanin A, Šoljić V, Saraga-Babić M, Vukojević K. The

 Vukusic Pusic 1, Janjić 1, Dujmović I, Poljičanin A, Soljić V, Saraga-Babić M, Vukojević K. The involvement in proliferation and apoptosis in the early human gonad development. Journal of Molecular Histology. 2013;44(1):55–63. (JIF: 1.979) Article published from the doctoral dissertation

1. Rod E, Matić I, Antunović M, Vetma V, Pavičić I, Hudetz D, Marijanović I, Primorac D, Ivković A. Optimization of an ex vivo gene transfer to the hamstrings tendons muscle remnants: potential for genetic enhancement of bone healing. Croatian Medical Journal. 2019;60(3):201-211. (JIF: 1.619)



Marija Roguljić after her dissertation defense during the COVID-19 pandemic

Roguljić Marija

Doctoral dissertation title

Ethical consideration regarding publication of identifiable patient photographs in academic journal

Mentor Full Professor Elisabeth Wager, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Marija Roguljić defended her doctoral dissertation on December 1, 2020, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Blanka Roje after her dissertation defense

Roje Blanka

Doctoral dissertation title

The microbiome's influence on the urinary bladder and the development of urinary bladder tumors

Mentor Full Professor Janoš Terzić, MD, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Blanka Roje defended her doctoral dissertation on April 9, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Roguljić M, Peričić TP, Gelemanović A, Jukić A, Šimunović D, Buljan I, Marušić M, Marušić A, Wager E. What Patients, Students and Doctors Think About Permission to Publish Patient Photographs in Academic Journals: A Cross-Sectional Survey in Croatia. Science and Engineering Ethics. 2020;26(3):1229-1247. (JIF: 2.275)
Roguljić M, Buljan I, Veček N, Dragun R, Marušić M, Wager E, Marušić A. Deidentification of facial photographs: a survey of editorial policies and practices. Journal of Medical Ethics.. 2022;48(1):56-60. (JIF: 2.021)

Article published from the doctoral dissertation

1. Roje B, Elek A, Palada V, Bom J, Iljazović A, Šimić A, Sušak L, Vilović K, Strowig T, Vlahoviček K, Terzić J. Microbiota Alters Urinary Bladder Weight and Gene Expression. Microorganisms. 2020;8(3):421. (JF: 4.167)



Edita Runjić and her mentor Livia Puljak

Runjić Edita

Doctoral dissertation title

Time needed for publication of systematic reviews in the field of biomedicine and factors associated with their publication

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2018/2019 The full dissertation is available in TRIBE's repository pdf

Edita Runjić defended her doctoral dissertation on February 14, 2020, at the TRIBE postgraduate doctoral program.



Dissertation defense via the GoToMeeting teleconference software during the pandemic. Melissa Kathleen Sharp and doctoral defense committee members

Sharp Melissa Kathleen

Doctoral dissertation title

The use of reporting guidelines as an educational intervention for teaching research methods and writing

Double degree doctorate University of Split and University of Paris Mentor Assoc. prof. Darko Hren Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository pdf

Melissa Kathleen Sharp defended her doctoral dissertation on May 26, 2020, at the TRIBE postgraduate doctoral program. Her dissertation is based on the Scandinavian model. The dissertation was written in English.

Articles published from the doctoral dissertation

1. Runjic E, Rombey T, Pieper D, Puljak L. Half of systematic reviews about pain registered in PROSPERO were not published and the majority had inaccurate status. Journal of Clinical Epidemiology. 2019;116:114-121. (JIF: 4.650)

2. Runjic E, Behmen D, Pieper D, Mathes T, Tricco AC, Moher D, Puljak L. Following Cochrane review protocols to completion 10 years later: a retrospective cohort study and author survey. Journal of Clinical Epidemiology. 2019;111:41-48. (JIF: 4.650)

Articles published from the doctoral dissertation

 Sharp MK, Utrobičić A, Gómez G, Cobo E, Wager E, Hren D. The STROBE Extensions: Protocol for a Qualitative Assessment of Content and a Survey of Endorsement. BMJ Open. 2017;7(10):e019043. (JIF: 2.369)
Sharp MK, Bertizzolo L, Rius R, Wager E, Gómez G, Hren D. Using the STROBE Statement: Survey Findings Emphasized the Role of Journals in Enforcing Reporting Guidelines. Journal of Clinical Epidemiology. 2019;116:26-35. (JIF: 4.650)

 Sharp MK, Hren D, Altman DG. The STROBE Extensions: Considerations for Development. Epidemiology. 2018;29(6):e53-e56. (JIF: 4.991)



Adrienne Stevens and her husband Chris Stevens (the Stevens team)

Stevens Adrienne

Doctoral dissertation title

Facilitating rapid dissemination of knowledge: towards the development of a rapid review reporting guideline

Mentor Full Professor David Moher, PhD Year of enrollment in the TRIBE program 2014/2015 The full dissertation is available in TRIBE's repository pdf

Adrienne Stevens defended her doctoral dissertation on January 9, 2019, at the TRIBE postgraduate doctoral program. The dissertation was written in English.



Ana Stipčić and her mentor Ozren Polašek

Stipčić Ana

Doctoral dissertation title

The importance of socioeconomic indicators in determining health and health-related risks in Southern Croatia

Mentor Full Professor Ozren Polašek, MD, PhD Year of enrollment in the TRIBE program 2012/2013 The full dissertation is available in TRIBE's repository pdf

Ana Stipčić (née Ćurković) defended her doctoral dissertation on October 29, 2018, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

Stevens A, Shamseer L, Weinstein E, Yazdi F, Turner L, Theilman J, Altman DG, Hirst A, Hoey J, Palepu A, Schulz K, Moher D. Relation of completeness of reporting of health research to journals' endorsement of reporting guidelines: systematic review. British Medical Journal. 2014;348:g3804. (JIF: 23.295)
Hersi M', Stevens A', Quach P, Hamel C, Thavorn K, Garritty C, Skidmore B, Vallenas C, Norris SL, Egger M, Eremin S, Ferri M, Shindo N, Moher D. Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: a rapid review. PLoS One. 2015;10(10): e0140290. (UIF: 2.766) («shared first autorship)

Articles published from the doctoral dissertation

1. Stipčić A, Ćorić T, Erceg M, Mihanović F, Kolčić I, Polašek O. Socioeconomic inequalities show remarkably poor association with health and disease in Southern Croatia. International Journal of Public Health. 2015;60(4):417-26. (JIF: 2.617)

 Miljković A⁺, Stipčić A⁺, Braš M, Dordević V, Brajković L, Hayward C, Pavić A, Kolčić I, Polašek O. Is experimentally induced pain associated with socioeconomic status — Do poor people hurt more? Medical Science Monitor, 2014;20:1232-1238. (JIF: 1.894) (*shared first autorship)



Lenko Šarić after dissertation defense via teleconference

Šarić Lenko

Doctoral dissertation title

Reporting quality and publication bias of randomized controlled trials and systematic reviews in the field of Anesthesiology and Pain

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2017/2018 The full dissertation is available in TRIBE's repository pdf

Lenko Šarić defended his doctoral dissertation on April 16, 2020, at the TRIBE postgraduate doctoral program.



Ana Šešelja Perišin and her mentor Darko Modun

Šešelja Perišin Ana

Doctoral dissertation title

Health care professionals' and students' attitudes toward collaboration between pharmacists and physicians

Mentor Full Professor Darko Modun, MD, PhD Year of enrollment in the TRIBE program 2011/2012 The full dissertation is available in TRIBE's repository pdf

Ana Šešelja Perišin defended her doctoral dissertation on May 30, 2019, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Sarić L, Dosenović S, Mihanović J, Puljak L, Biomedical conferences' author instructions rarely mention guidelines for reporting abstracts of trials and systematic reviews. Journal of Comparative Effectiveness Research. 2020;9(2):83-91. (JIF: 1.468)

2. Šarić L, Došenović S, Saldanha IJ, Jeličić Kadić A, Puljak L. Conference abstracts describing systematic reviews on pain were selectively published, not reliable, and poorly reported. Journal of Clinical Epidemiology. 2020;117:1-8. (JIF: 4.952)

 Sarić L, Vučić K, Dragičević K, Vrdoljak M, Jakus D, Vuka I, Jeličić Kadić A, Saldanha IJ, Puljak L. Comparison of conference abstracts and full-text publications of randomized controlled trials presented at four consecutive World Congresses of Pain: Reporting quality and agreement of results. European Journal of Pain. 2019;23(1):107-116. (JIF: 3.188) Articles published from the doctoral dissertation

1. Šešelja-Perišin A, Meštrović A, Klinar I, Modun D. Health care professionals' and students' attitude toward collaboration between pharmacists and physicians in Croatia. International Journal of Clinical Pharmacy. 2016;38(1):16-9. (JIF: 1.508)

 Šešelja Perišin A, Meštrović A, Božić J, Kačić J, Bukić J, Leskur D, Rušić D, Zekan L, Stipić M, Modun D. Interprofessional pharmacotherapy workshop: intervention to improve health professionals' and students' attitudes towards collaboration between physicians and pharmacists. Journal of Interprofessional Care. 2019;33(5):456-463. (JIF: 1.601)



Marija Šimundić Munitić and her mentor Ivona Bago (in the small rectangle in the upper right-hand corner)

Šimundić Munitić Marija

Doctoral dissertation title

Antimicrobial efficacy of bioceramic root canal sealers

Mentor **Full Professor Ivona Bago, DMD, PhD** Year of enrollment in the TRIBE program **2015/2016** The full dissertation is available in **TRIBE's repository** pdf

Marija Šimundić Munitić defended her doctoral dissertation on January 7, 2021, at the TRIBE postgraduate doctoral program.



Ružica Tokalić and her mentor Ana Marušić

Tokalić Ružica

Doctoral dissertation title

Completeness of reporting and quality of evidence in clinical practice guidelines

Mentor Full Professor Ana Marušić, MD, PhD Year of enrollment in the TRIBE program 2017/2018 The full dissertation is available in TRIBE's repository pdf

Ružica Tokalić defended her doctoral dissertation on July 27, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Šimundić Munitić M, Bago I, Glockner K, Kqiku L, Gabric D, Anić I. Effect of Different Laser Treatments on the Bond Strength of Intracanal Fiber Posts Cemented with a Self-Adhesive Resin Cement. Journal of Prosthodontics. 2019;28(1):e290-e296. (JIF: 2.172)

2. Šimundić Munitić M, Poklepović Peričić T, Utrobičić A, Bago I, Puljak L. Antimicrobial efficacy of commercially available endodontic bioceramic root canal sealers: A systematic review. PLoS One. 2019;14(10):e0223575. (JIF: 2.776) Articles published from the doctoral dissertation

 Tokalić R, Vidak M, Buljan I, Marušić A. Reporting Quality of European and Croatian Health Practice Guidelines According to the RIGHT Reporting Checklist. Implementation Science. 2018;13(1):135. (JIF: 7.327)
Tokalić R, Vidak M, Buljan I, Marušić A. Reporting of Clinical Practice Guidelines: Practical Testing of AGREE and RIGHT Checklists. Journal of General Internal Medicine. 2020;35(7):2167-2172. (JIF: 5.128)



Helena Tomljenović after dissertation defense



Marin Viđak and his mentor Ana Marušić

Tomljenović Helena

Doctoral dissertation title

The role of cognitive and emotional factors in health decision making

Mentor **Full Professor Andreja Bubić, PhD** Year of enrollment in the TRIBE program **2016/2017** The full dissertation is available in **TRIBE's repository** pdf

Helena Tomljenović defended her doctoral dissertation on June 23, 2020, at the TRIBE postgraduate doctoral program. The dissertation was written in English.

Viđak Marin

Doctoral dissertation title

Is there a difference in perception of organizational ethical climate in academic organizations? Multi-method study at a medical school and school of humanities

Mentor Full Professor Ana Marušić, MD, PhD Year of enrollment in the TRIBE program 2018/2019 The full dissertation is available in TRIBE's repository pdf

Marin Vidak defended his doctoral dissertation on October 21, 2021, at the TRIBE postgraduate doctoral program.



 Tomljenović H, Bubić A, Erceg N. It Just Doesn't Feel right — The Relevance of Emotions and Intuition for Parental Vaccine Conspiracy Beliefs and Vaccination Uptake. Psychology & Health. 2020;35(5):538-554. (JIF: 2.528)

 Tomljenović H, Bubić A. Cognitive and emotional factors in health behaviour: Dual-process reasoning, cognitive styles and optimism as predictors of healthy lifestyle, healthy behaviours and medical adherence. Currrent Psychology. 2021;40:3256–3264. (JIF: 2.051)

3. Tomljenović H, Bubić A, Hren D. Decision making processes underlying avoidance of mandatory child vaccination in Croatia - a qualitative study. Currrent Psychology. 2020;1-15. (JIF: 2.051) Articles published from the doctoral dissertation

1. Vidak M, Buljan I, Tokalić R, Lunić A, Hren D, Marušić A. Perception of Organizational Ethical Climate by University Staff and Students in Medicine and Humanities: A Cross Sectional Study. Science and Engineering Ethics. 2020;26(6):3437-3454. (JIF: 3.525)

 Vidak M, Barać L, Tokalić R, Buljan I, Marušić A. Interventions for Organizational Climate and Culture in Academia: A Scoping Review. Science and Engineering Ethics. 2021;27(2):24. (JIF: 3:525)





Nikolina Vrljičak Davidović and her mentor Tomislav Franić

Vrljičak Davidović Nikolina

Doctoral dissertation title

Premature cessation and bias in publishing interventional trials in the field of child and adolescent mental health

Mentor Assoc. prof. Tomislav Franić, MD. PhD. Year of enrollment in the TRIBE program 2015/2016 The full dissertation is available in TRIBE's repository pdf

Nikolina Vrljičak Davidović (née Davidović) defended her doctoral dissertation on October 19, 2021, at the TRIBE postgraduate doctoral program.



Ana Vuica and her mentor Natalija Filipović

Vuica Ana

Doctoral dissertation title

Influence of age and diabetes mellitus type 1 on expression of vitamin D receptor, 1 Alpha-hydroxylase and 24-hydroxylase in liver of rat

Mentor Full Professor Natalija Filipović, PhD Year of enrollment in the TRIBE program 2013/2014 The full dissertation is available in TRIBE's repository pdf

Ana Vuica defended her doctoral dissertation on June 27, 2016, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

 Vrljičak Davidović N, Tokalić R, Burilović E, Pejdo S, Marušić A, Singh S, Franić T. Low dissemination rates, non-transparency of trial premature cessation and late registration in child mental health: observational study of registered interventional trials. European Child and Adolescent Psychiatry. 2020;29(6):813-825. (JIF: 4.785)
Vrljičak Davidović N, Komić L, Mešin I, Kotarac M, Okmažić D, Franić T. Registry versus publication: discrepancy of primary outcomes and possible outcome reporting bias in child and adolescent mental health. European Child and Adolescent Psychiatry. 2021. doi: 10.1007/s00787-020-01710-5. (JIF: 4.785) Articles published from the doctoral dissertation

 Vulca A, Vukojević K, Ferhatović Hamzić L, Jerić M, Puljak L, Grković I, Filipović N. Expression pattern of CYP24 in liver during ageing in long-term diabetes. Acta Histochemica. 2016;118(5):486-95. (JIF: 1.347)
Vuica A, Ferhatović Hamzić L, Vukojević K, Jerić M, Puljak L, Grković I, Filipović N. Aging and a long-term diabetes mellitus increase expression of 1 α-hydroxylase and vitamin D receptors in the rat liver. Experimental Gerontology. 2016;72:167-76. (JIF: 3.485)



Ivana Vuka and her mentor Livia Puljak

Vuka Ivana

Doctoral dissertation title

Efficacy and safety of dorsal root ganglion stimulation for treatment of different pain conditions in humans and in animal pain models

Mentor Full Professor Livia Puljak, MD, PhD Year of enrollment in the TRIBE program 2016/2017 The full dissertation is available in TRIBE's repository: a disertation embargo is in place until all publications have been published

Ivana Vuka defended her doctoral dissertation on April 1, 2021, at the TRIBE postgraduate doctoral program.

Articles published from the doctoral dissertation

1. Vuka I, Vucic K, Repic T, Ferhatovic Hamzic L, Sapunar D, Puljak L. Electrical stimulation of dorsal root ganglion in the context of pain: a systematic review of in vitro and in vivo animal model studies. Neuromodulation. 2018; 21(3):213-224. (JIF: 4.029)

 Vuka I, Marciuš T, Došenović S, Ferhatović Hamzić L, Vučić K, Sapunar D, Puljak L. Neuromodulation with electrical field stimulation of dorsal root ganglion in various pain syndromes: a systematic review with focus on participant selection. Journal of Pain Research. 2019;12:803-830. (JIF: 2.581)

3. Vuka I, Došenović S, Marciuš T, Ferhatović Hamzić Lejla, Vučić K, Sapunar D, Pulajk, L. Efficacy and safety of pulsed radiofrequency as a method of dorsal root ganglia stimulation for treatment of nonneuropathic pain: a systematic review. BMC Anesthesiology 2020;20:1-21. (JIF: 1.922)

4. Vuka I, Marciuš T, Došenović S, Ferhatović Hamzić Lejla, Vučić K, Sapunar D, Pulajk, L. Efficacy and Safety of Pulsed Radiofrequency as a Method of Dorsal Root Ganglia Stimulation in Patients with Neuropathic Pain: A Systematic Review. Pain Medicine. 2020;21(12):3320-3343. (JIF: 2.782)

 Vuka I, Marciuš T, Kovačić D, Šarolić A, Puljak L, Sapunar D. Implantable, programmable, autonomous, and reusable device for electrical stimulation of dorsal root ganglion in freely-moving rats: a proof of concept study. Journal of Pain Research. 2021;14:3759-3772. (JIF: 3.133) Contract ? 10 Marks OFFICE OFF

The Journal Impact Factor (JIF) of each journal in which articles stemming from the individual dissertations were published was recorded at the time of each dissertation defense. For doctoral students who changed their surname during their doctoral studies, the surname they noted in their doctoral dissertations is listed.

And here we are at the end of the book

What **our students** have said about the program

TRIBE — the best investment I made for my future scientific career Andrija Babić, Institute of Emergency Medicine of the Split-Dalmatia County

At the end of my mandatory internship for medical doctors, I got a job at an ER in Vrgorac. Some would say that's far away, some would find it difficult, and some would say it's stressful. I could agree with all of them. Emergency medicine is all of the above, and you'll see all kinds of things there. But there are days when the shifts are quiet. That's when you can pass the time by watching TV, reading, relaxing, or perhaps playing Play Station. I got bored of all of that stuff (and some of it I didn't like in the first place), and that got me thinking about how I could make the most of my time while waiting for emergency patients to come in.

Although I didn't know in what direction my medical career was going to go at the time, and postgraduate education was not popular among ER people, I nonetheless decided to reach out to my master's thesis mentor, Prof. Livia Puljak, and let her know I'd like to do scientific work and enroll in a postgraduate program. Livia, being as responsible and thorough as she is, accepted my idea but on one condition. I first had to prove that I was really motivated and that I could complete my assignments on time and TRIBE

212

successfully. At the time, she was researching pain and writing systematic reviews on analgesics from the World Health Organization's list. During this study (which I completed exactly and on time), she got the idea for my doctoral dissertation, which I accepted wholeheartedly. We decided to explore the risks of bias in Cochrane systematic reviews, and she suggested that I enroll in the Translational Research in Biomedicine (TRIBE) postgraduate program at the University of Split School of Medicine in the autumn.

One should listen to their mentor, so I did as she said. Now, after I've completed the program and defended my doctoral dissertation, I can proudly say that it was the best investment in my future scientific career. I can confidently claim that TRIBE is the best postgraduate program at the School of Medicine in Split. Apart from the fact that this is supported by all the performance criteria (such as the percentage of enrolled applicants that complete the program i.e. obtain their doctorate within a reasonable period), this was also confirmed by accreditations from external institutions. I was extremely proud when only TRIBE, out of all the doctoral programs of the School of Medicine in Split. got the high-guality label of the Agency for Science and Higher Education (ASHE) during the re-accreditation that they performed in December 2016. The accreditation was nationwide, and, apart from TRIBE, in the area of biomedicine and health, only the doctoral program of the Faculty of Pharmacy and Biochemistry got the same high-quality label.

That's not an easy thing to achieve. Even when I was just enrolling, I could see that TRIBE stood out from the rest. I know many colleagues that enrolled in a postgraduate program 10 or more years ago. Many of them have not only published nothing, but they haven't even started their research or know what they want to research. Your grade point average is not important for enrolling in the TRIBE program. It's important that you want to do scientific work, that you're motivated, persistent, and that you have a research idea. This is where your mentor comes in. We sometimes believe that we can do it alone, that we'll be able to overcome all obstacles, and that we only need a mentor on paper. This is where I agree with the

directors of the TRIBE program. Prof. Sapunar and Prof. Puliak. Mentors are extremely important for doctoral students: it's important that they are scientifically prolific and that they help you in everything. We can have a research idea, but our mentors are there to help us define it in more detail. A mentor is supposed to be vour scientific parent and best friend, as my mentor Livia says. TRIBE and its directors know this well and stick to it. They help everyone that has a good plan to perfect it, make it better, and almost perfect. They truly are available all the time and everywhere, ready to talk to anyone who wants to become a student of the program; they're ready to give advice and assistance and criticize everything they know is not good and that will make it more difficult for us to get to our ultimate goal, which is to obtain a PhD. Always online, they keep breaking records for e-mail response times and work day and night. They're real freaks when it comes to science! The TRIBE program expects a lot from its students and mentors, but it also gives a lot in return. The first year is demanding and it contains lots of things that provide you with a solid base as a scientific novice. From learning about the ethical principles of research, statistics, writing your first scientific article, how to look through databases to get high-quality and credible information, how to store documents and data. assess the quality of evidence, write grant applications, and work in the laboratory; they teach you about entrepreneurship, communication and presentation skills and many other things; anything we could encounter in our scientific careers.

However, the exams aren't what students find to be most important or "most difficult". In order to move up to the next year of the program, a student has to progress in their research. Progress reports are the most important exams in the program and something that motivates you to keep doing what you're supposed to be doing. I've yet to see a better method that encourages students to conduct research while studying and that drives them so much. You can't enroll in the third year if you aren't making progress in your main assignment, which is conducting research. We'll all pass the exams, but if we don't publish any research and get our PhDs within a reasonable time frame, the exams are irrelevant.

When you write an application for your doctoral dissertation topic, the directors of the program are there for any type of help you need; from getting the paperwork done, giving advice for resolving reasonable and less reasonable demands from the Committee for Doctoral Dissertations, to technical issues. The same goes for when you're writing your dissertation as well as caring for your scientific output and progress after you've defended your dissertation. For all that are willing to listen, the directors of the program provide help and suggestions for further research that is conducted within labs and groups, both at the School of Medicine and outside of it.

TRIBE is designed to be a demanding and effective program that enrolls a small number of students. Candidates are intensely involved even before enrolling in the TRIBE program; their progress is constantly and thoroughly monitored, they are provided with assistance as well as constructive criticism and advice.

I'm proud to have studied at TRIBE and this is why, for all those that want to continue with their postgraduate education, enroll in the best place, where they will be able to successfully obtain their doctorate the fastest way (albeit by putting in the required effort), where all of the teachers and directors of the program will be fully engaged and dedicated to you until the very end, I wholeheartedly suggest to enroll in TRIBE.

Remaining a student

Ognjen Barčot, Department of Surgery, University Hospital of Split

I may not have been a TRIBE student from start to finish, but at least I was a real student at one point, meaning that I was, for the first time, satisfied with what I'd learned. Not only with the exams I'd passed or that I'd obtained my doctorate. After you've received some professional recognition, it's a bit more difficult to fulfill your usual student obligations, and it's even more difficult to justify yourself to teachers when you get over a certain age. I say "teachers" on purpose because real teachers encourage you to succeed. The encouragement might not always be pleasant or follow a well-trodden path. The encouragement can take the form of criticism, and the path can turn out to be one long, winding detour. But the longer you walk it, the more companions you get! And good ones at that, who are following that same path and heading in the same direction. You learn to use your knowledge on the go, to value others' efforts; you learn to see opportunities even on the bad paths, to bypass and jump over obstacles; you learn not to give up and how to play the "Man, Don't Get Angry" game. But what kind of student experience

would it be if it was all purely academic? Student life is a rhapsody: a free-flowing experience. So, every published article or rejected dissertation topic application prompted vet another spontaneous celebration. involving a lot of improvisation. Especially during the COVID-19 crisis. And that's what should be nurtured! The joy of succeeding and the feeling that the world is listening to you closely. And in that crowd, there is a pair of eves that's sensitive to brightness and not just color. There is speech that remains wordless and you hear only tones. There is a face and hands of which you know only a silhouette, and you dream of dancing with them. Oh, how lovely it is to be a student! Briefly not to be in the presence of poets happily in love. To be thirsty and hungry, eager and in love. To burn for the indescribable, live for the untouchable, exhaust vourself endlessly in order to love the unattainable.

But was every part of it good in the end? You decide. Some of my largest desires became memories. Some I've only just begun to strive for, and some I've only just noticed. What's important is to have been and to remain a student!

The TRIBE program: a great opportunity and a great experience

Marija Roguljić, University of Split School of Medicine

Bearing in mind the well-being of patients, the medical profession requires lifelong education. After completing my internship and several years of working as a clinician, I started to think about enrolling in a postgraduate
program as a way of investing in my professional life. At that moment in time, a doctorate seemed like a big decision given my private and professional obligations, but I decided to take that step forward.

I faced a number of difficulties from the very start; from choosing a topic and mentor to conducting research. During my interview for enrollment in the TRIBE program, the directors of the program, Prof. Damir Sapunar and Prof. Livia Puljak were very clear about the criteria for enrollment, and the conditions were that I had to choose a good topic that was realistic to complete, and I had to have a serious, responsible mentor. Therefore, I didn't enroll on my first try.

The following year, I was able to meet the criteria and became a student of the TRIBE program. At that time of my life, I was already way past being used to university classes and assignments. I found myself back in the classroom, and this was one of the best experiences of my education. I felt privileged not only to learn from our professors, themselves acclaimed scientists in my field, but also from fellow students of different professions, from medicine to molecular biology and mathematics. It was a very positive, enthusiastic environment where we learned about the scientific research process and scientific methodology related to our own research, with the encouragement of our lecturers. The program was designed as a platform that would offer all the tools required to successfully conduct the research necessary to complete a doctoral dissertation.

Going ever deeper into the scientific methodology, I started to slowly change my way of thinking, which had repercussions in my own research as well as my clinical practice. The scientific way of thinking is structured, sometimes rigid but consistent, and this creates a certain level of certainty in assessments and decision-making. I slowly began to learn what evidence-based medicine was and increasingly perceived its actual application in clinical practice. I learned to better read scientific literature, evaluate the quality of evidence, and apply it better in my day-to-day work.

This process was not nearly as easy or as fast as I thought it would be. It's not easy to face yourself and admit that there's a lot you don't know, that you feel a certain insecurity or even fear of whether you can learn or master it at all. Will I succeed in the end?! Will I ever be able to publish a scientific article in a good journal?! Then you look around and see your colleagues in similar situations and you realize that it can be done after all. They were able to succeed, to publish articles, so I guess I'll be able to as well. My colleagues were a big motivator for my work. Some of them helped me a lot with things I didn't know, so we became friends in the process.

At the program, I met Prof. Ana Marušić, who truly is everything I believe a real mentor should be. Firstly, she had a lot of patience and compassion for my lack of knowledge, panic, and impatience. She led me through the process of writing my doctorate one step at a time, making me increasingly more self-reliant as I approached the finish line. I am immensely grateful to her for everything she has taught me and for the patience she has had in helping me overcome my obstacles to reaching my goal. From her, I learned what a mentor should be: competent, available, and unselfish in sharing their knowledge. I hope to be like that myself someday.

After defending my doctoral dissertation, I gained a new sense of security and acknowledgment in my professional life; a lasting feeling that I'd achieved something great and useful, not only for myself but also for the people around me. I believe that I'm much better today not only in my scientific work (where there's still a lot of room for improvement) but that I'm better in my role as a clinician and teacher as well.

What makes me especially happy is working with students. I try to point out to newer generations the importance of reading and understanding scientific literature as well as that of applying evidence in everyday clinical work.

I'm deeply grateful for the opportunity I got at TRIBE, to all the colleagues I learned from and with who I got to collaborate and still collaborate with because knowledge is a source of wealth and power that nobody can take away from you.

expensive tuition fees just so the institution can make money off of them. We want TRIBE to be a small, "boutique" doctoral program that enrolls a small number of students, giving them a lot of attention. We encourage all our students to email or call us whenever they need to so that we can help them resolve any possible issues. Of course, this means that our approach to students requires a lot of work and it would not be possible to apply the same approach to a large number of students. Many students ask for our assistance with their ongoing articles and dissertations, and we constantly try to help them with any problems they may have with their research or mentors.

Despite all the obstacles and inconveniences we have experienced, our students' success is what motivates us to move on with TRIBE. Writing this book was a bittersweet experience for us. On the one hand, it is nice to recall all of our successes. However, on the other side, it is painful to recall all of the unpleasant experiences and all the discrimination we had to deal with. One might ask why even mention the unpleasant experiences. Why not just boast about the successes of the program? Our reasoning is simple: we hope that, by documenting the negative experiences, we will help prevent ourselves or others from ever having to experience such challenges again. One might learn a lesson from these ugly stories about what not to do. Those who, like us, want to create better programs in our environment, can see from this book what they might have to deal with if they try to change the system. Margaret Mead once said: "Never

doubt that a small group of thoughtful committed citizens can change the world. Indeed, it's the only thing that ever has [changed the world]." Through our work at TRIBE, we, immodestly, believe that, along with all the colleagues that have helped us in this endeavor over the years, we have changed our small part of the world for the better. The success of our students and the results of external evaluations prove that we are on the right path.

A few words to wrap up

The idea for the TRIBE program came from one of the authors, Damir Sapunar. The program was conceived idealistically and was meant to address the shortcominos that we see in the other doctoral programs with which we've had experience. Idealists see the world as it might or should be, unlike pragmatists who focus on the world as it is now. In dreaming of a better program over these 10 years, we have continuously listened to our students' suggestions, adapted the program to the profile of the students that were enrolled, and tried to introduce changes that would lead to higher success rates for students. The excellent mark we achieved in the re-accreditation process as well as our students' success attest to the fact that we succeeded in this. Up to March of 2021, 52% of students that enrolled in the TRIBE program obtained their doctorates (not counting the students that were enrolled in the past three academic years and that are still students or those that unenrolled), which is equivalent to the success rate of American or Canadian doctoral students.

Our entire, complex system of choosing and monitoring students is subject to the pursuit of ever higher student success rates. We do not want to enroll students who we believe do not have a high chance of obtaining a doctorate with their current plans. We do not want students at the School to pay