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Smoljanović T, Bojanić I, Hannafin JA, Hren D, Delimar D, Pećina M. Traumatic and overuse injuries among international elite junior rowers. Am J Sports Med. 2009;37:1193-9.

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BACKGROUND: Junior rowers have competed internationally for over 4 decades, and there are no epidemiological data available on traumatic and overuse injury in this population. OBJECTIVE: To define the types of musculoskeletal problems present in international elite-level junior rowers and to determine whether gender, physical stature, rowing discipline, and training programs affect the incidence of reported injuries. STUDY DESIGN: Descriptive epidemiology study. METHODS: Injury data were obtained from a total of 398 rowers (42% female, 58% male) who completed a 4-page questionnaire on injury incidence while participating at the Junior World Rowing Championships in Beijing, People's Republic of China, in August 2007. RESULTS: Overall, 290 (73.8%) reported injuries involved overuse, and 103 (26.2%) were related to a single traumatic event. Female rowers were injured more frequently than male rowers (110.2 vs 90.5 injuries per 100 rowers). In both genders, the most common injury site was the low back followed by the knee and the forearm/wrist. The severity of reported injuries was incidental in 65.1%, minor in 21.4%, moderate in 10.4%, and major in 3.1% of cases. The rowers with traumatic injuries had less rowing experience than the uninjured rowers (median [C] ± interquartile range [Q] = 3 ± 3 years vs 4 ± 3 years; $P = 0.043$, Mann-Whitney test). Sweep rowers who changed rowing side during the current season had significantly more acute-onset low back injuries ($P = 0.012$, χ^2 test) than those who did not change rowing side during the same period. The incidence of traumatic injuries was significantly lower in rowers who regularly performed more than 10 minutes of posttraining stretching ($P = 0.030$, χ^2 test). Athletes who ran more than once a week had more overuse knee injuries than those who ran once or less per week ($P = 0.033$, χ^2 test). CONCLUSION: Elite junior rowers attending the World Rowing Championships reported predominantly overuse injuries of low severity during the current rowing season. Low back injuries were the most frequent complaint of elite-level junior rowers.

Fišter K, Polašek O, Vuletić S, Kern J. Single nucleotide polymorphisms and health behaviours related to obesity – trawling the evidence in the prospect of personalised prevention. Stud Health Technol Inform. 2009;150:762-6.

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Efforts aimed at primary and secondary prevention of cardiovascular diseases, the major killer of contemporary adult populations, largely rely on modification of risk behaviours related to smoking, physical activity, dietary intake, and alcohol consumption, and also control of obesity and hypertension, the interim risk states between health and disease. We propose that the extent to which the gene x 'obesogenic' environment interaction depends on associations between particular single nucleotide polymorphisms (SNPs) and behavioural risk factors for overweight or obesity determines opportunities for novel, personalised preventive interventions. We systematically searched for SNPs that might be of interest for this postulate, and we present various SNPs that have been shown to be associated with overweight or obesity and behavioural risk factors for developing these traits, and thus hold promise for future design of personalised preventive interventions.

Pivac N, Nedić G, Mustapić M, Babić A, Stipčević T, Borovečki F, et al. The lack of genotype-phenotype relationship between platelet serotonin concentration and serotonin transporter gene promoter polymorphism in healthy subjects. Neurosci Lett. 2009;462:45-8.

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A polymorphism in the serotonin transporter gene (5-HTTLPR) is frequently studied for association with antidepressant treatment response, different personality traits, and psychiatric disorders. Baseline platelet serotonin (5-HT) concentration has been proposed to indicate a good or a poor treatment response to antidepressant drugs and to be associated with particular symptoms in psychiatric disorders. The aim of the study was to elucidate the genotype-phenotype relationship between platelet 5-HT concentration and 5-HTTLPR in healthy subjects. The frequency of 5-HTTLPR genotypes and alleles, as well as platelet 5-HT concentration was evaluated in 434 male and 86 female unrelated healthy medication-free Caucasian subjects of Croatian origin. A two-way ANOVA revealed no significant difference in platelet 5-HT concentration subdivided according to the particular 5-HTTLPR genotype, no significant effect of sex, no significant effect of genotype, and no significant interaction between sex and genotype on platelet 5-HT concentration. In addition, one-way ANOVA did not detect significant effects of homozygous S/S genotype, or homozygous L/L genotype on platelet 5-HT concentration. Our results showed a lack of significant association between platelet 5-HT concentration and 5-HTTLPR variants, suggesting that there is no functional relationship between 5-HTTLPR alleles and platelet 5-HT concentration in the large groups of healthy male and female medication-free Caucasian subjects, free of neuro-psychiatric disorders.

Vanura K, Vrsalović Marušić M, Le T, Marculescu R, Kušec R, Jäger U, et al. V(D)J targeting mistakes occur at low frequency in acute lymphoblastic leukemia. Genes Chromosomes Cancer. 2009;48:725-36.

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Translocations of proto-oncogenes to the B-cell or T-cell antigen receptor loci in acute T- or B-cell leukemia and lymphoma have been, in most cases, accredited to V(D)J or switch recombination depending on the location of the breakpoint at the receptor locus. Only in rare instances, the reports take into account mechanistic characteristics of the translocation mechanism. To assess the functional ability of several sites implicated in supposedly V(D)J-mediated translocations, we tested five sites at four proto-oncogene loci in an ex vivo recombination substrate assay for their potential to act as direct target for V(D)J recombination. Our results show that the LMO2/RBTN2/TTG2 site and one LCK/P56 site readily engage in recombination with a genuine TCR element with the majority of breakpoint junctions showing the characteristics of V(D)J recombination, which strongly supports the involvement of this mechanism in the pathogenesis of the corresponding translocations in vivo. The site at the TLX1/HOX11 locus yielded 0.8% V(D)J-specific junctions. Sites at the LCK/P56 and TCF3/E2A proto-oncogenes resulted in exclusively unspecific breakpoints scattered over part of or the entire proto-oncogene region tested, marking them as unlikely V(D)J recombination targets. Our data suggest that, while being a potentially dangerous mechanism due to the introduction of DNA breaks, V(D)J recombination is a tightly controlled mechanism allowing for only few direct mistakes.

Dumić K, Krnić N, Škrabić V, Stipančić G, Cvijović K, Kušec V, et al. Classical congenital adrenal hyperplasia due to 21-hydroxylase deficiency in Croatia between 1995 and 2006. Horm Res. 2009;72:247-51.

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AIMS: To evaluate the incidence, gender, symptoms and age at diagnosis of patients with classical congenital adrenal hyperplasia (CAH) due to 21-hydroxylase deficiency in Croatia. METHODS: Data were collected retrospectively for all classical CAH patients born or electively aborted following prenatal diagnosis between January 1, 1995 and December 31, 2006 and were compared with the data of a previously conducted study evaluating CAH patients discovered between 1964 and 1984. RESULTS: During a 12-year period 34 classical CAH patients were born. There were 20 salt-wasting (SW; 12 female/8 male) and 14 simple-virilizing (SV; 7 female/7 male) patients. If 3 female, electively aborted fetuses were added, there would be a total of 37 CAH patients. With 532,942 live births and 34 CAH patients born over this period, the incidence of classical CAH was estimated at 1:15,574 or 1:14,403 if the 3 electively aborted fetuses were included. The lower incidence of SW boys compared to SW girls (8:12) and similar number of SW and SV boys (8:7) indicate that a substantial proportion of SW boys die unrecognized. Owing to better

healthcare, the diagnosis was established significantly earlier in SW and SV girls compared to the period of 1964-1984 ($p < 0.003$). During 1995-2006, none of the patients died following the diagnosis of CAH and there was no erroneous sex assignment. CONCLUSION: Despite improvements in healthcare, the diagnosis of CAH in Croatia is still delayed and some of the patients go unrecognized or die. Therefore, the results of our study support the need to introduce newborn screening.

Zafirova B, Mandarić S, Antulov R, Krmpotić A, Jonsson H, Yokoyama WM, et al. Altered NK cell development and enhanced NK cell-mediated resistance to mouse cytomegalovirus in NKG2D-deficient mice. Immunity. 2009;31:270-82.

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NKG2D is a potent activating receptor on natural killer (NK) cells and acts as a molecular sensor for stressed cells expressing NKG2D ligands such as infected or tumor-transformed cells. Although NKG2D is expressed on NK cell precursors, its role in NK cell development is not known. We have generated NKG2D-deficient mice by targeting the Klrk1 locus. Here we provide evidence for an important regulatory role of NKG2D in the development of NK cells. The absence of NKG2D caused faster division of NK cells, perturbation in size of some NK cell subpopulations, and their augmented sensitivity to apoptosis. As expected, Klrk1(-/-) NK cells are less responsive to tumor targets expressing NKG2D ligands. Klrk1(-/-) mice, however, showed an enhanced NK cell-mediated resistance to mouse cytomegalovirus infection as a consequence of NK cell dysregulation. Altogether, these findings provide evidence for regulatory function of NKG2D in NK cell physiology.

Kuzman MR, Medved V, Terzić J, Krainc D. Genome-wide expression analysis of peripheral blood identifies candidate biomarkers for schizophrenia. J Psychiatr Res. 2009;43:1073-7.

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The aim of this study was to analyze gene expression in blood of patients with newly-diagnosed schizophrenia during their first psychotic episode and subsequent remission. Whole blood samples were obtained from 32 untreated patients presenting with their first psychotic episode suggestive of schizophrenia and 32 age- and gender-matched controls. Using Affymetrix micoarrays, we identified significantly altered expression of 180 gene probes in psychotic patients compared to controls. A subset of four significantly changed genes was further confirmed with QRT-PCR. The following genes were significantly altered in patients: glucose transporter, SLC2A3 ($p<0.001$) and actin assembly factor DAAM2 ($p<0.001$) were increased, whereas translation, zinc metallopeptidase, neurolysin 1 and myosin C were significantly decreased ($p<0.05$). Expression of these candidate markers was also analyzed in a longitudinal study (12-24 months) in 12 patients who achieved full remission. Interestingly, expression of DAAM2 returned to control levels in patients who were in remission after their first psychotic episode, suggesting that its expression correlates with diseases progression and/or response to treatment. In summary, we identified changes of gene expression from peripheral blood which might help discriminate patients with schizophrenia from controls. While these results are promising, especially for DAAM2 whose polymorphic variants have been found significantly associated with schizophrenia, it will be important to analyze larger cohorts of patients in order to firmly establish changes in gene expression as blood markers of schizophrenia.

Lauc G, Zoldoš V. Epigenetic regulation of glycosylation could be a mechanism used by complex organisms to compete with microbes on an evolutionary scale. Med Hypotheses. 2009;73:510-2.

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Glycosylation is the most diverse post-translational protein modification. It is essential for multicellular life and its complete absence is embryonically lethal. Hundreds of specific enzymes are involved in the synthesis of complex oligosaccharide structures that are covalently bound to protein backbones. This process is not template driven and thus results in a huge complexity of glycoproteome, estimated to be several orders of magnitude larger than proteome. Large structural variability provided by glycans represents a significant evolutionary advantage and nearly all proteins invented after the appearance of the multicellular life are glycosylated. Glycosylation represents a way how complex organisms could develop novel structural features without introducing probably deleterious changes in their genome. Intricate mechanisms by which the interplay of gene expression and intracellular localization of

their products give rise to specific glycan structures is only starting to be understood, but some evidence suggests that epigenetic regulation of glycosylation might be used to create novel biological structures. Here we suggest a hypothesis that epigenetic regulation of genes involved in glycan synthesis might represent a way how newly developed structural advantages could be transmitted through generations, thus providing a tool for complex organisms to compete with high speed of evolution of unicellular organisms.

Pikija S, Cvetko D, Hajduk M, Trkulja V. Higher mean platelet volume determined shortly after the symptom onset in acute ischemic stroke patients is associated with a larger infarct volume on CT brain scans and with worse clinical outcome. Clin Neurol Neurosurg. 2009;111:568-73.

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OBJECTIVE: Mean platelet volume (MPV) determined shortly after the onset of acute ischemic stroke represents the pre-stroke values. Data on its relationship to stroke severity/outcome have been conflicting. We related MPV to infarct volume on CT brain scans and risk of death/dependence 7 days and 3 months post-stroke. METHODS: MPV (within 30h since stroke onset), infarct volume (13-83h since stroke onset) and clinical outcomes were evaluated in 81 consecutive patients (32 men, age 52-91 years, 10 small artery occlusion, 10 large artery atherosclerosis, 29 cardioembolic, 32 multiple probable/possible etiology). RESULTS: Higher MPV was independently associated with larger ln-infarct volume [estimate 0.259, 95% confidence interval (CI) 0.004-0.513, P=0.046], greater risk of death/dependence 7 days post-stroke [relative risk (RR)=1.077, 95% CI 1.005-1.115, *P*=0.036], and greater risk of death/dependence 3 months post-stroke (RR=1.077, 95% CI 1.001-1.158, *P*=0.048). Considered covariates: stroke etiology, CT scan timing, platelet count and other hematological parameters, demographic variables, history of cerebrovascular, cardiac or cardiovascular diseases, diabetes, serum chemistry, previous antiplatelet and statin use and treatments delivered after the index event. CONCLUSIONS: Data support the view about MPV as a determinant of severity/outcome of the acute ischemic stroke.

Kuhta M, Pavlin D, Slaj M, Varga S, Lapter-Varga M, Slaj M. Type of archwire and level of acidity: effects on the release of metal ions from orthodontic appliances. Angle Orthod. 2009;79:102-10.

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OBJECTIVE: To examine the effects of three different parameters-pH value, type of archwire, and length of immersion-on release of metal ions from orthodontic appliances. MATERIALS AND METHODS: Simulated fixed orthodontic appliances that corresponded to one-half of the maxillary arch were immersed in artificial saliva of different pH values (6.75 ± 0.15 and 3.5 ± 0.15) during a 28-day period. Three types of archwires were used: stainless steel (SS), nickel-titanium (NiTi), and thermo NiTi. The quantity of metal ions was determined with the use of a high-resolution mass spectrophotometer (HR-ICP/MS). RESULTS: The release of six different metal ions was observed: titanium (Ti), chromium (Cr), nickel (Ni), iron (Fe), copper (Cu), and zinc (Zn). Repeated measures statistical analysis of variance (ANOVA) was used. Results showed that (1) the appliances released measurable quantities of all ions examined; (2) the change in pH had a very strong effect (up to 100-fold) on the release of ions; and (3) the release of ions was dependent on wire composition, but it was not proportional to the content of metal in the wire. The largest number of ions was released during the first week of appliance immersion. CONCLUSION: Levels of released ions are sufficient to cause delayed allergic reactions. This must be taken into account when type of archwire is selected, especially in patients with hypersensitivity or compromised oral hygiene.