

immunohistochemistry and in situ hybridization. The evaluation of our results is that the stratum intermedium, enamel knot and ameloblasts consist much Hsp60 protein. During the culturing we used exogen Hsp60 protein in the case of the treated tooth germs, the medium of the control group did not contain Hsp60. In case of the treated tooth germs the enamel knot was enlarged and the distal parts were blunt. The control tooth germs had normal morphology. We performed Apoptag TUNEL-Assay and BrdU incorporation test to gain information about the effect of Hsp60 on the life-cycle of the cells. The BrdU incorporation test did not find any difference between the groups. The TUNEL Assay detected several apoptotic cells around the enamel knot. We detected and described the localization of the Hsp60 during the development of tooth germ. During the in vitro experiments we simulated the effect of the Hsp60, the treated tooth germs had abnormal morphology, the control tooth germs had normal morphology. According to our results the Hsp60 influences not only the morphology but also the life-cycle of the tooth germs' cells.

P/4. SYNTHESIS OF ANTICOAGULANT PENTASACCHARIDE SULFONIC ACIDS

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Keywords: heparin, anticoagulation, pentasaccharide, sulfonic acid, glycosylation

INTRODUCTION: Heparin is a linear, highly sulfated polysaccharide that has been used clinically as an antithrombotic agent since 1940s. Heparin interacts with

antithrombin, a serine protease inhibitor that blocks thrombin and factor Xa in the coagulation cascade. We have been dealing with the synthesis of sulfonic acid analogues of the anticoagulant pentasaccharide domain of heparin. Longer duration of action and increased activity of the molecules are expected by exchanging the primary sulfate esters to bioisosteric sodium-sulfonatomethyl moieties. **METHODS:** We have been preparing a series of pentasaccharide sulfonic acid analogues via [2+3] block synthesis by using different trisaccharide acceptors and disaccharide donors containing sulfonatomethyl moieties at different positions. After the assembly of the fully protected pentasaccharides, further eight more synthetic steps including deprotection and O-sulfation are required for each derivatives. During the organic preparative work, the reactions were monitored by thin layer chromatography. Column chromatography was used for separation and purification. NMR spectroscopy, mass spectrometry and elemental analysis were used for structural determination. **RESULTS:** Two sulfonic acid analogues were successfully synthesized in good yields, a disulfonate and a trisulfonate analogues. In vitro evaluation of the anticoagulant activity of these new sulfonic-acid derivatives revealed that the disulfonate analogue has an outstanding anti-Xa activity, however the trisulfonate analogue inhibited the factor Xa with significantly lower efficacy. As a continuation of this research, synthesis of other sulfonic acid derivatives has been decided. **CONCLUSIONS:** In the frame of this work, we have found that the pentasaccharide sulfonic acids inhibited efficiently the blood coagulation factor Xa, however, in a substantially different rate depending on the number and position of the sulfonatomethyl groups. We plan to finish the deprotection reactions of all derivatives, and

then our series of pentasaccharide sulfonic acids will be useful as probes for structure-activity studies and potential leads for new anticoagulant drugs.

MULTIDISCIPLINARY SESSION XII.

Q. Prevention-Pulmonology

Q/1. SMOKING AND FAMILY INTERACTIONS AMONG ADOLESCENTS

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Keywords: smoking, adolescence problem, behaviour, risk factors, family interactions

Adolescence is a critical life period from the viewpoint of different substance uses, for instance smoking and alcohol consumption. The family has an essential role in case of adolescents' problem and health behaviour. Family relationships and different family interactions have a significant influence on the adolescents' behavioural patterns. In this life period the social network is usually reorganised and the relationship between the adolescents and parents also changes. The study was performed in all of the elementary and high schools of Mako and the villages in its area in Hungary. The pupils of grade from 7 to 13 were questioned anonymously in 2013 the study consisted of 2011 pupils. Self-administered questionnaires were applied. The survey included sociodemographic variables, lifetime and monthly prevalence of problem behaviours (smoking and alcohol drinking), different influencing factors, beliefs, attitudes related to substance use and

family interactions. Descriptive statistics, cross-tabulations and chi-square tests were used to test these interrelationships with SPSS MS 19.0 statistical program. Significant relationship was detected between negative family interactions and substance use. The parents' critical behaviour could be increase the risk of substance use. The family is an important microenvironment for the adolescents therefore the relationships and interactions among family members could be protective and risk factors too. The appropriate management of family conflicts could contribute to decrease the risk of different problem behaviours or risky substance use. This research was supported by the European Union and the State of Hungary, co-financed by the European Social Fund in the framework of TÁMOP-4.2.4.A/2-11/1-2012-0001 'National Excellence Program'.

Q/2. THE AWARENESS AND ATTITUDE OF THE HPV VACCINE

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Keywords: HPV, vaccine, prevention, cross-sectional survey, STD

Introduction: HPV is an STD and a common tumour virus which causes mainly cervix cancer in women and oropharyngeal cancer in women and men. Vaccine is available against HPV, until nowadays in Hungary people needed to buy this vaccine, but from next years it will be free for girls at the age of 12-13. We investigated the awareness and