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Day 1

Thursday, 18th May 2023

FEBS Education Session "Innovative teaching as a basis for Excellent Research in BioSciences"

Chairs: Adlija Čaušević, Ferhan Sagin, Tamer Bego

08:00 – 09:00

Registration

09:00 – 09:15

Introduction and presentation of FEBS activities

Miguel de la Rosa (University of Sevilla, Spain) & Jerka Dumić (University of Zagreb Faculty of Pharmacy and Biochemistry, Zagreb, Croatia)

09:15 – 10:00

Plenary Lecture

Why and how should you develop and improve your educator skills?: Tips for both junior & senior scientists

Plenary Speaker: Ferhan Sagin (Ege University Faculty of Medicine, Izmir, Turkey)

10:00 – 10:25

Transferable skills and biochemistry education for the needs of industry

Invited Speaker: Jerka Dumić (University of Zagreb Faculty of Pharmacy and Biochemistry, Zagreb, Croatia)

10:25 – 10:50

Raising the innovation potential through teaching programs in molecular biology

Invited Speaker: Lejla Kapur Pojskić (University of Sarajevo-Institute for Genetic Engineering and Biotechnology, Sarajevo, Bosnia and Herzegovina)

10:25 – 11:00

Coffee Break

11:00 – 11:25

Innovative Teaching I - Integrative online tools for learning and teaching biochemistry face to face

Invited Speaker: Nino Sinčić (University of Zagreb, School of Medicine, Zagreb, Croatia)

11:25 – 11:50

Innovative Teaching II - Integration of virtual laboratories in learning of biochemistry

11:50 – 12:30 *Invited Speaker: Angel Herraéz (University of Alcalá, Department of Systems Biology, Biochemistry and Molecular Biology Unit, Spain)*
Expert Talk
Be a scientist, not a worker in science

Invited Speaker: Miguel de la Rosa (University of Sevilla, Spain)

12:30 – 14:00 **Lunch Break**
14:00 – 15:30 Workshop
How to keep a good lab book?

Invited Speaker: Jason Perret (Universite Libre de Bruxelles (ULB), Faculty of Medicine-Campus Erasme, LBPN-Biochemistry Department, Laboratory of Pathophysiological and Nutritional Biochemistry, Belgium)

17:00 – 18:00 **Registration**
18:00 – 18:40 **Opening Ceremony**
18:40 – 19:30 **Opening Plenary Lecture**
FEBS National Lecturer
From Bench to Bedside: Translating Science from the Lab to Clinical Practice

Plenary Speaker: Dragan Primorac (University of Split, School of Medicine, Croatia; St Catherine Specialty Hospital, Zagreb, Croatia)

19:30-19:50 Sponsored Symposium - Diamedic: BD Totalys - Total Solution for Cervical Cancer Screening

Danijel Sumpor (BD, Zagreb, Croatia)

Day 2

Friday, 19th May 2023

08:00 – 09:00

Registration

09:00 – 09:30

Honorary Lecture

The Matter of Life and its Corrosion in the Course of Aging and Diseases

Plenary Speaker: Miroslav Radman, online (Mediterranean Institute for Life Sciences, Split, Croatia) The Matter of Life and its Corrosion in the Course of Aging and Diseases

Session I - Basic and applied biochemistry

Chairs: Emina Kiseljaković, Jerka Dumić, Edhem Hasković

09:30 - 10:10

Plenary Lecture

Functional Diversity of Cytochrome c in its Journey from Mitochondria to Nucleus

Plenary Speaker: Miguel de la Rosa (University of Sevilla, Spain)

10:10 - 10:30

Galectin-3 in pathogenesis, diagnosis and outcome prediction of Covid-19

Invited Speaker: Jerka Dumić (University of Zagreb, Faculty of Pharmacy and Biochemistry, Zagreb, Croatia)

10:30-10:50

The Aquaporins water channels and pleiotropically beyond – an overview

Invited Speaker: Jason Perret (Universite Libre de Bruxelles (ULB), Faculty of Medicine-Campus Erasme, LBPB-Biochemistry Department, Laboratory of Pathophysiological and Nutritional Biochemistry, Belgium)

10:50 - 11:05

Sponsored Symposium - Labunica: Trends in molecular diagnosis of respiratory virus infections

Irena Tabain (Croatian Institute of Public Health, Zagreb, Croatia)

11:05 - 11:25 High-content screening and multi-omics as advanced tools in toxicology of nanoparticles

Invited Speaker: Andi Alijagić, online (Örebro University, Sweden)

11:25 - 11:40 Sponsored Symposium - Farmavita

11:40 - 11:55 Sponsored Symposium - Medichem: Noninvasive procedures in liver fibrosis diagnostics

Filip Filipić (Medichem d.o.o, Sarajevo, Bosnia and Herzegovina)

11:55 - 12:10 *Discussion*

12:10 - 12:30 *Coffee Break*

12:30 - 12:40 Determination of the mechanism and cause of death in heat stroke: Focus on the correlation of troponin I and 70 kDa heat shock protein

Short Talk: Dervišević Emina (University of Sarajevo, Faculty of Medicine, Department of Forensic Medicine, Sarajevo, Bosnia and Herzegovina)

12:40 - 12:50 The C-Reactive Protein/Albumin Ratio and Glasgow Prognostic Score as Indicators of Disease Activity in Patients with Inflammatory Bowel Disease

Short Talk: Mlaćo Lamija (University of Sarajevo, Medical Faculty, Department of Human Physiology, Sarajevo, Bosnia and Herzegovina)

12:50 - 13:00 Evaluation of Serum Pentraxin 3 Levels in Patients with Migraine

Short Talk: Kösem Arzu; Evaluation of Serum Pentraxin 3 Levels in Patients with Migraine (Ministry of Health Ankara Etlik City Hospital, Department of Biochemistry, Ankara, Turkey)

13:00 - 14:30 **Lunch and Poster Session (Sessions I, II and V)**

Parallel Sessions

Session II - Molecular genetics

Chairs: Kasim Bajrović,
Lejla Kapur Pojskić

Plenary Lecture

Microbiome in post-genomic era

Plenary Speaker: Maria Gazouli

14:30 –
15:15

Session V - Interactions between organisms and the environment

Chairs: Dalibor Ballian, Erna Karalija

Plenary Lecture

Molecular based selection methods and genetic diversity in forestry

14:30 –
15:10

	<p><i>(National and Kapodistrian University of Athens, Faculty of Medicine of the NKUA, Laboratory of Biology, Greece)</i></p>		<p><i>Plenary Speaker: Gaye Eren Kandemir (Ministry of Agriculture and Forestry, Forest Tree Seeds and Tree Breeding Research Institute Directorate, Ankara, Turkey)</i></p>
15:15 – 15:45	<p>Genome Editing in Plants: Advances and Applications in Agriculture (Invited lecture)</p> <p><i>Invited Speaker: Mehmet Cengiz Baloglu, online (Kastamonu University, Turkey)</i></p>	15:10 – 15:30	<p>Application of DNA barcoding for identification of different organisms within forest ecosystems</p> <p><i>Invited Speaker: Nevenka Čelepirović (Laboratory of molecular-genetic testing, Division of genetics, forest tree breeding and seed science, Croatian Forest Research Institute, Jastrebarsko, Croatia)</i></p>
15:45 – 16:05	<p>Some molecular, biochemical and nutritional aspects of human obesity - Case study from N. Macedonia (Invited lecture)</p> <p><i>Invited Speaker: Zoran Popovski (Ss. Cyril and Methodius University, Faculty of Agriculture and Food Sciences, Department for biochemistry and genetic engineering, North Macedonia)</i></p>	15:30 – 15:50	<p>Raising the progeny to fight back: from seed priming to transgenerational memory</p> <p><i>Invited Speaker: Erna Karalija (University of Sarajevo, Faculty of Science, Sarajevo, Bosnia and Herzegovina)</i></p>
16:05 – 16:25	<p>Liquid biopsies in cancer diagnosis monitoring and prognosis</p> <p><i>Invited Speaker: Ines Stevic, online (Sysmex Inostics, Hamburg, Germany)</i></p>	15:50 - 16:10	<p>Interaction of Douglas fir provenances in Bosnia and Herzegovina with the environment</p> <p><i>Invited Speaker: Mirzeta Memišević Hodžić (University of Sarajevo, Faculty of Forestry, Sarajevo, Bosnia and Herzegovina)</i></p>
16:25 – 16:45	<p>Discussion/ Coffee Break</p>	16:10- 16.45	<p>Discussion/ coffee break</p>

16:45- 17:00	Genetics of thermal stress tolerance in breeding animals <i>Short Talk: Husein Ohran (University of Sarajevo - Veterinary Faculty, Department of Physiology, Bosnia and Herzegovina)</i>	16:45 - 16:55	Identification of vitamin biosynthesis pathway in thermophilic <i>Leptolyngbya</i> sp. and effects of macronutrients manipulation on its growth <i>Short Talk: Mohd Noh Nur Izzati (Universiti Teknologi Malaysia, Faculty of Science, Department of Biosciences, Malaysia)</i>
17:00 - 17:15	Influence of the ACE2 gene polymorphism (rs2285666) on complete blood count <i>Short Talk: Neven Meseldzic (University of Sarajevo - Faculty of Pharmacy, Bosnia and Herzegovina)</i>	16:55 - 17:05	Terpene compounds and their pharmacological potential <i>Short Talk: Carev Ivana (Mediterranean Institute for Life Sciences, Split, Croatia)</i>
17:15 - 17:30	Discussion	17:05- 17.15	Discussion

Day 3Saturday, 30th May 2023**Parallel Sessions***Session III - Molecular and precision medicine*

Chairs: Adlija Čaušević, Tanja Dujčić, Daria Ler

09:00 –
09:45**Plenary Lecture**

Genomics as a basis for precision medicine

*Plenary Speaker: Sonja Pavlović (Institute of Molecular Genetics and Genetic Engineering (IMGGE), University of Belgrade, Belgrade, Serbia)*09:45 –
10:10

Precision medicine in type 2 diabetes

*Invited Speaker: Sabina Semiz (College of Medicine and Health Sciences, Khalifa University, Abu Dhabi, United Arab Emirates)*10:10 –
10:35

Pharmacogenomics and pharmacotranscriptomics of acute leukemia in children: a path to personalized medicine

*Invited Speaker: Branka Zukić (Institute of Molecular Genetics and Genetic Engineering (IMGGE), University of Belgrade, Belgrade, Serbia)*10:35–
10:45**Short Break**10:45 –
11:10

Pharmacogenomics of hematopoietic stem cell transplantation

*Invited Speaker: Vid Mlakar**Session IV - Molecular Biotechnology*

Chairs: Lada Lukić Bilela, Jasmina Čakar, Filipe Natalio

Plenary LectureLum^{AI}: Neutrophil chemiluminescent fingerprint kinetics for etiological agent phylum triage in an emergency room setting*Plenary Speaker: Robert S. Marks (Ben-Gurion University of the Negev, Be'er Sheva, Israel)*

From a vision to new research established in the field of marine biotechnology

Invited Speaker: Ana Rotter (Marine Biology Station Piran, National Institute of Biology, Piran, Slovenia)
Harnessing the power of enzymes: Innovative approaches for designing new materials*Invited Speaker: Filipe Natalio (Weizmann Institute of Science, Department of Plants and Environmental Science, Rehovot, Israel)***Short Break**

Molecular basis of stress tolerance of wheat cultivars - How complex it might be?

	(CANSEARCH Research platform for pediatric oncology and hematology, University of Geneva, Geneva, Switzerland)	Invited Speaker: Ariola Bacu, online (University of Tirana, Faculty of Natural Sciences, Department for Biotechnology, Tirana, Albania)
11:10 – 11:35	Multiomics approaches uncovering epigenetic regulation of non-coding-loci	Discovery of biocatalysts and the paths for their identification
	Invited Speaker: Tijana Mitić, online (Center for Cardiovascular Science, The Queen's Medical Research Institute, Edinburgh BioQuarter, Edinburgh, Scotland)	Invited Speaker: Inga Matijošytė, online (Sector of Applied Biocatalysis, Institute of Biotechnology, Life Sciences Center of Vilnius University, Lithuania)
11:35 – 12:00	Sponsored Symposium - Roche: Comprehensive genomic profiling: Taking precision medicine from vision to reality	Discussion
	Inga Marijanović (Department of Oncology, University Clinical Hospital of Mostar; School of Medicine, University of Mostar, Mostar, Bosnia and Herzegovina)	
12:00 – 13:30	Light Lunch and Poster Session (Sessions III and IV)	Light Lunch and Poster Session (Sessions III and IV)
13:30 – 13:40	Overview of parallel clinical exome sequencing in diagnostics of rare diseases from a 2-year period	Initial experiences with home-developed mitochondrial DNA software “Mitowizz” for clinical and forensic application
	Short Talk: Rijad Konjhodžić (ALEA Genetic Center, Sarajevo, Bosnia and Herzegovina)	Short Talk: Nejira Handžić (ALEA Genetic Center, Sarajevo, Bosna and Hercegovina)
13:40 – 13:50	CDKALI variants and response to metformin in patients with type 2 diabetes	Effects of lyophilized leech saliva extract on in vitro cell migration and apoptotic/ necrotic cell death on the human breast cancer cell line (MDA-MB-231)
	Short Talk: Selma Imamović Kadrić (University of Sarajevo-Faculty of Pharmacy, Sarajevo, Bosnia and Herzegovina)	Short Talk: Ünal Kübranur (University of Gazi, Faculty of Medicine, Department of Medical Biochemistry, Ankara, Türkiye)

13:50 – 14:00	<p>Evaluation of gene expressions of ER stress markers ATF6, IRE1 and PERK in neutrophils during multiple sclerosis attack therapy</p> <p><i>Short Talk: Canan Akçin (TOBB University of Economics and Technology, Department of Biomedical Engineering, Ankara, Turkey)</i></p>	<p>Diagnostic testing for SARS-CoV-2 by Real Time RT-PCR</p> <p><i>ShortTalk: Danijela Blagojević (Hospital Sveti Vračevi, Bijeljina, Bosnia and Herzegovina)</i></p>
14:00 – 14:10	<p>Apoptotic pathway of human colorectal carcinoma can be regulated via scorpion venom</p> <p><i>Short Talk: Serdar Karakurt (Selcuk University, Faculty of Science, Department of Biochemistry, Konya, Turkey)</i></p>	
14:10 – 14:40	<p style="text-align: center;">Closing Lecture</p> <p style="text-align: center;">Molecular anthropology - How to predict past?</p> <p style="text-align: center;">Invited Speaker: Damir Marjanović (International Burch University, Sarajevo, Bosnia and Herzegovina; Laboratory for Molecular Anthropology, Center for Applied Bioanthropology, Institute for Anthropological Research, Zagreb, Croatia)</p>	
14:40 – 15:00	<p style="text-align: center;">FEBS Open Bio Poster Prize/ Closing Ceremony</p>	

MUTATION RATES OF 22 AUTOSOMAL STR LOCI IN A EUROPEAN POPULATION FROM CENTRAL BALKAN, REPUBLIC OF SERBIA

Garai Nemanja¹, Pešović Jovan¹, Dobrijević Zoran², Brkušanić Miloš¹, Matijašević Joković Suzana¹, Radenković Lana¹, Radovanović Nemanja¹, Karanović Jelena¹, Brajušković Goran¹, Savić-Pavićević Dušanka¹

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Analysis of short tandem repeats (STRs) is a tool for human DNA identification, including paternity and criminal investigations. Locus-specific STR mutation rates are critical for interpretation of DNA identification in practice. Accumulating evidence suggests that STR mutation rates are population-specific. However, STR mutation rates based on trios have not been analyzed in European population yet. In this study, mutation rates of 20 CODIS and two additional autosomal STR loci (Penta E and Penta D) were determined from 1279 cases of paternity testing in the Serbian population, and the relationships between STR mutation rates and sex, allele length, and heterozygosity were investigated. A total of 63 mutations were observed at 18 loci in a total of 28278 allele transmissions, including 62 (98.4%) single-step and 1 (1.6%) two-step mutations. The average mutation rate was 1.7×10^{-3} (95% CI: $1.3-2.3 \times 10^{-3}$), whereas locus-specific mutation rates ranged from 5.6×10^{-3} (D12S391) to 0.6×10^{-3} (D2S1338, D5S818, and D21S11). No mutation was observed at the TPOX, TH01, D16S539, and D22S1045 loci. The mutation rate of paternal origin (2.4×10^{-3}) was eight times higher than that of maternal origin (0.3×10^{-3}), and long alleles mutated more frequently than short and medium alleles ($\chi^2=4.436$ and $\chi^2=4.646$, respectively, $p<0.05$). No differences were found when analyzing overall expansion versus contraction ($\chi^2=0.999$, $p=0.317$). Among short alleles two expansions and no contraction were detected, while among long ones three expansions and nine contractions were observed. Furthermore, we found no correlation between locus-specific mutation rates and corresponding heterozygosity ($r_s=-0.188$, $p=0.559$). Comparisons between populations revealed statistically significant differences in locus-specific mutation rates of 13 CODIS STRs between Serbian population and Chinese or Brazilian. Our results show that STR mutation rates depend on sex, allele size and population, and provide useful data on STR mutation rate based on trios for human DNA identification in European populations.

Keywords: short tandem repeat (STR), mutation rate, paternity testing, DNA identification, population data

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