PERIODICUM BIOLOGORUM
VOL. 118, No 4, 315–317, 2016
DOI: 10.18054/pb.v118i4.4911

UDC 57:61
CODEN PDBIAD
ISSN 0031-5362

editorial

The 40th Anniversary of the HDBMB

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In 2016, the Croatian Society of Biochemistry and Molecular Biology (HDBMB) celebrated its 40th Anniversary. To honour this noteworthy jubilee, various events were organised with the aim of bringing molecular life sciences closer to the general public *(1)*. The main celebration took place during the HDBMB2016 Congress held in Split, June 1-4, 2016 *(2,3)*. This issue is also a part of the celebration, and I thank the Croatian Society of Natural Sciences, as the publisher of *Periodicum biologorum,* for joining in for our Jubilee this way.

Forty years of stimulating, meaningful and fruitful activity of the HDBMB is evident in the scientific conferences that have been a powerful and important driving force for the development of biochemistry and molecular biology in Croatia. Our congresses stand out with their high-quality scientific program and have been recognized as such by the Croatian and international scientific community as well as its international roof organisations – FEBS (Federation of European Biochemical Societies) and IUBMB (International Union of Biochemistry and Molecular Biology). Therefore, I am honoured and delighted that nine renowned lecturers, who led scientific program at our conferences held in 2014, 2015 and 2016, responded shortly after my invitation and wrote articles for this issue of *Periodicum biologorum*. I hope that their effort indicates and signifies their strong support for the future work and activities of the HDBMB. With pleasure I take this opportunity to introduce shortly their main scientific achievements and connections with HDBMB.

Prof Hermona Soreq (The Hebrew University of Jerusalem, Jerusalem, Israel), a distinguished neurobiologist, recipient of the *FEBS National Lecture Award*, gave an inspiring opening lecture entitled „From mice to men: fine tuning of cholinergic signalling by microRNAs" at the HDBMB2014 Congress held in Zadar. Her research is centred on acetylcholine functioning, with focus on molecular biology and genomic applications to the study of cholinergic signalling, and especially on its microRNA regulation. Her work spans both basic and biomedical studies on cholinergic signalling in health and disease, particularly on anxiety-related topics. In the review entitled *MicroRNA regulators of cholinergic signalling link neuromuscular, cardiac and metabolic systems* Prof Soreq described key links between microRNAs with known cardiac and metabolic functions, and emphasized that miRNAs might improve our understanding of the inter-tissue communication allowing a more encompassing look on disorders involving impaired cholinergic signalling *(4)*.

Prof William Martin (Institute for Molecular Evolution, University of Düsseldorf, Düsseldorf, Germany), a renowned evolutionary biologist, contributed with his plenary talk to the top quality of the scientific programme of HDBMB2014. His research interests comprise endosymbiosis and endosymbiotic gene transfer, the origin and evolution of anaerobic energy metabolism and compartmentation of biochemical

pathways in eukaryotes. In the review *Physiology, phylogeny, and the energetic roots of life* Prof Martin pointed out that, for a more complete picture of microbial evolution, life's tree as well as the chemical roots on life's tree, one has to incorporate aspects of physiology, phylogeny, and the geological record *(5).* This is an important topic that goes back 100 years.

At the opening of HDBMB2016, Prof Susan S. Taylor (University of California San Diego, La Jolla, USA) received the IUBMB medal for her scientific achievements and recognition as an outstanding educator in the field of biochemistry, and gave a memorable *IUBMB Ed Wood Plenary Lecture*. Prof Taylor is a distinguished researcher with notable scientific achievements in elucidating the structure, dynamics, and localization of protein kinase A (PKA), one of the cell's most important signalling molecules. In 1991, Prof Taylor solved the crystal structure of PKA's catalytic subunit, which is conserved through the kinase family. In 2005, she succeeded in explaining how PKA's regulatory subunit inhibits the catalytic subunit in the absence of cAMP. Anchoring PKA to other signalling proteins via polyvalent A Kinase Anchoring Proteins (AKAPS) creates targeted „signalosomes" that are then committed to the regulation of ion channels, mitochondria morphology, and exocytosis. These discoveries, which led to a full understanding of how PKA works, Prof Taylor summarised in the review *PKA and the Structural Kinome (6).*

It is important to note that each congress was an opportunity to establish or encourage collaboration with Croatian scientists from abroad. We hosted Dr Sanja Sever, Prof Ivan Mijaković, and Dr Zoran Radić in 2014, as well as Prof Ivan Matić in 2016 and they readily agreed to prepare papers for this issue.

Dr Sanja Sever (Harvard Medical School, Boston, USA) presented her research focused on podocyte structure and function and the large regulatory GTPase dynamin in a review entitled *Podocytes and the actin cytoskeleton as a feasible therapeutic target.* Her recent studies suggest that dynamin is a critical regulator of actin dynamics in healthy and diseased podocytes *(7).* Therefore, a better understanding of podocyte pathobiology will pave the way for developing a cure for kidney diseases in the future.

Prof Ivan Mijaković (Chalmers University of Technology, Gothenburg, Sweden) and colleagues prepared an original scientific paper with new results on signalling and regulatory phenomena based on protein phosphorylation *(8).* Their findings contributed to the emerging picture that bacterial proteins undergo phosphorylation at multiple residues, and suggested that the complexity of bacterial cellular regulation could be underestimated.

Prof Ivan Matić (INSERM, Université Paris Descartes, Paris, France) received the *FEBS National Lecture Award* at HDBMB2016. Prof Matić, a distinguished geneticist, gave an inspiring plenary talk on his recent research of molecular mechanisms involved in the control of the rate of accumulation of genetic polymorphisms, either by maintaining genetic stability or by increasing genetic variability. Prof Matić for the first time provided evidence that stress-induced mutagenesis is not only an unavoidable by-product of mechanisms involved in survival under stress, but that it could be selected for its capacity to increase the evolvability of bacterial populations. In his paper, Prof Matić gave a review on the molecular mechanisms involved in the control of regulation of mutation rates in bacteria *(9).*

Dr Zoran Radić (University of California San Diego, La Jolla, USA) started his research in acetylcholinesterase (AChE) reaction kinetics under the mentorship of the late Dr Elsa Reiner, one of the founding contributors in the field of cholinesterases and the first president of the Croatian Biochemical Society, later HDBMB. Although Dr Radić presented his work at our 2008 congress in Osijek and 2014 congress in Zadar, his article has an additional background since he is an awardee. To be more precise, Dr Radić is the recipient of the *Spiridon Brusina Medal* for 2016, an award received for the promotion and support of Croatian science and scientists established by the Croatian Society of Natural Sciences in memory of its founder, and in return the awardee is asked to prepare a paper in *Periodicum biologorum*. The Medal was awarded at the 40th anniversary of the HDBMB in Zagreb (October 28, 2016), when Dr Radić gave an inspiring 3D lecture entitled *50 years of allosteric hypothesis in cholinesterases, 25 years of its proof* (3). Dr Radić and colleagues used an overlay-independent comparison of a larger number of PDB deposited AChE crystal structures to see if deviations of AChE backbone fragments could be identified. These results were presented in a paper by Rocher et al. *(10)* and may be of use in AChE structure-activity considerations and eventually contribute additional guidance in the AChE structure-based drug discovery and design.

Ever since its earliest beginnings, our society has had a fruitful collaboration with the Slovenian Biochemical Society (SBS) that recently resulted in the joint organisation of the FEBS 3+ meeting *From Molecules to Life and Back*, held in Opatija (together with the Hungarian Biochemical Society), June 13-16, 2012 and *Molecules of Life* held in Portorož, Slovenia, September 16-19, 2015 (together with the Hungarian and Serbian Biochemical Society). At the HDBMB2016, Prof Janko Kos (Jožef Stefan Institute, Ljubljana, Slovenia), president of SBS, was an invited speaker in *the FEBS 3+meeting session*. His talk as well as his review article is focused on the role of cystatins and cysteine cathepsins in the immune response, with emphasis on their role in the regulation of cytotoxicity of natural killer cells and cytotoxic T lymphocytes *(11).*

Dr Dušica Vujaklija (Ruđer Bošković Institute, Zagreb, Croatia), our respected molecular geneticist, was an invited speaker as a representative of the HDBMB at the FEBS 3+ meeting *Molecules of Life* held in Portorož,

Slovenia in 2015. In a scientific paper entitled *Variations in amino acid composition in bacterial single stranded DNA–binding proteins correlate with GC content (12)*, Dr Vujaklija presented *in silico* analyses of the amino acid composition and properties of two distinct SSB domains in relation to bacterial GC content. The results were compared and discussed with respect to the relative amino acid composition of 961 proteomes from different organisms.

I thank all of the authors for their scientific contributions in this journal issue as well as all of the reviewers for their valuable comments and suggestions.

This issue is dedicated to the memory of our founders, distinguished seniors and perennial officials – Dr Elsa Reiner, Prof Pavao Mildner, Dr Berislav Pende, Prof Mirna Flögel-Mršić, Prof Željko Kućan, Prof Milivoj Popović, Dr Blanka Ries, Dr Vera Simeon, and Dr Ljubinka Vitale.

REFERENCES

1. *Priroda, Vol 106, No 1049, 1-2/2016*
2. Book of Abstracts of the Congress of the Croatian Society of Biochemistry and Molecular Biology on the Occasion of the 40th Anniversary, HDBMB2016 (Kovarik Z, Katalinić M (eds.), Croatian Society of Biochemistry and Molecular Biology, Zagreb, pp. XVI+132
3. KOVARIK Z, DUMIĆ J, VARLJEN J 2016 The 40th Anniversary of the Croatian Society of Biochemistry and Molecular Biology, 1976-2016, Croatian Society of Biochemistry and Molecular Biology, Zagreb, pp. 1-76.
4. PIENICA C, SOREQ H 2016 MicroRNA regulators of cholinergic signaling link neuromuscular, cardiac and metabolic systems. *Periodicum biologorum* 118 (4): 373-379
5. MARTIN WF 2016 Physiology, phylogeny, and the energetic roots of life. *Periodicum biologorum* 118 (4): 343-352
6. TAYLOR SS, KORNEV AP 2016 PKA and the structural kinome. *Periodicum biologorum* 118 (4): 329-342
7. SEVER S, GU C 2016 Podocytes and the actin cytoskeleton as a feasible therapeutic target. *Periodicum biologorum* 118 (4): 381-384
8. DEROUICHE A, PETRANOVIC D, MACEK B, MIJAKOVIC I 2016 *Bacillus subtilis* single-stranded DNA-binding protein SsbA is phosphorylated at threonine 38 by the serine/threonine kinase YabT. *Periodicum biologorum* 118 (4): 399-404
9. MATIC I 2016 Molecular mechanisms involved in the regulation of mutation rates in bacteria. *Periodicum biologorum* 118 (4): 363-372
10. RADIĆ Z, ROHRER J, SIDHOM M, HAN J 2016 Overlay-independent comparisons of X-ray structures reveal small, systematic conformational changes in liganded acetylcholinesterase. *Periodicum biologorum* 118 (4): 319-328
11. PRUNK M, PERIŠIĆ NANUT M, SABOTIČ J, KOS J 2016 Cystatins, cysteine peptidase inhibitors, as regulators of immune cell cytotoxicity. *Periodicum biologorum* 118 (4): 353-362
12. PARADŽIK T, FILIĆ Ž, VUJAKLIJA D 2016 Variations in amino acid composition in bacterial single stranded DNA–binding proteins correlate with GC content. *Periodicum biologorum* 118 (4): 385-397