

# International Conference on Extremophiles 2016

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More than 390 participants representing research organizations from 29 countries have met in September 12–16, 2016 at the 11th International Congress on Extremophiles in Kyoto, Japan. The meeting was chaired by Harry Atomi from Kyoto University and it focused on topics like ecology and diversity, genetics, genomics, physiology, metabolism, enzymology and applications of extremophilic microorganisms. In this Special Issue Edition we would like to highlight a selection of articles from various speakers in the plenary sessions and workshops of the Extremophiles Congress 2016. These articles, which cover a broad and versatile range of topics, will contribute to get a new insight into the research activities of our active community. Thus, we are pleased to introduce the following research articles and reviews:

Basen and Müller review metabolic differences in the acetogenesis of thermophilic microorganisms and discussed their high potential for biotechnological applications (Basen and Müller 2016). The second review in this Special Edition by Ito and Takahashi characterized bacterial flagellar motors from alkaliphilic *Bacillus* and *Paenibacillus* sp. and their unique coupling ions (Ito and Takahashi 2016).

Kikawada and Gusev and their team focus their investigations on thermophilic eukaryotes, the larvae of the

African midge *Polypedilum vanderplanki*, which show high tolerance against desiccation, accurately defined as anhydrobiosis. The establishing of functional assays and methods, like gene transfer and silencing, as well as microarray techniques for transcriptional responses, were performed to shed light on molecular mechanisms underlying anhydrobiosis (Sogame et al. 2016; Ryabova et al. 2016).

Atomi and co-workers performed genetic analyses on the role of endopeptidases, which are necessary for the final cleavage of the C-terminal regions of [NiFe]-hydrogenases. Two endopeptidases of the archaeon *Thermococcus kodakarensis* were investigated by disruption (Kanai et al. 2016).

*Thermus thermophilus* was used as the model organism in the article of Nishiyama and partners. Here, a novel feedback control mechanism for the biosynthesis of tryptophan through an inter-RAM domain interaction is described (Kubota et al. 2016).

The group of Terns reconstituted functional Type I-G crRNP complexes in vitro from recombinant Cas proteins and investigated mechanisms of DNA recognition and cleavage (Majumdar et al. 2016).

The study of Tori and Perler shed light on protein splicing of three class 3 mini-inteins, describing the sequential formation of two branched intermediates (Tori and Perler 2016).

The research article by the team of Ito deals with mutations of MrpA and MrpD subunits of the Mrp-type Na<sup>+</sup>/H<sup>+</sup> antiporter of the alkaliphilic microorganism *Bacillus pseudofirmus* and brought new insights into these unusual structured hetero-oligomeric complexes (Morino et al. 2016).

Extremophiles and their heat-active robust enzymes, known as Extremozymes, are attractive candidates for various industrial applications. Schröder and colleagues from Antranikian's team characterized two  $\alpha$ -galactosidases

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from thermophilic bacteria and showed their broad substrate spectrum, illustrating their potential for the use in food and feed industry (Schröder et al. 2016).

The original publication from Albers' team presented interesting results regarding AgIH, the initial protein of the N-glycosylation pathway of the thermoacidophilic crenarchaeon *Sulfolobus acidocaldarius* (Meyer et al. 2016).

We thank our authors for their outstanding contributions and hope that you enjoy reading this Special Issue.

Yours Sincerely  
Garo Antranikian

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