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EBEC 2020: The conference that should have taken place!

The European BioEnergetic Conference (EBEC) which is held every two years, brings together for 6 days nearly 500 researchers from all over the world sharing their interests and expertise in all molecular, cellular and medical aspects of biological energy conversion. It was a great honour for us and Aix-Marseille University to be in charge of the organisation of the 21st EBEC, which should have been held in Aix-en-Provence. What a frustration to see such a fantastic meeting on Bioenergetics brought down by a virus, that's the last straw, devoid of any bioenergetic capacity! Thanks to the International Committee, the 21st edition of Aix-en-Provence has been postponed to 2022, but the great scientific "Forum" was still missing for 2020. Fortunately, Biochimica et Biophysica Acta systematically supports the event by offering invited speakers the opportunity to contribute to a special issue, in the form of a review or an original paper. This special issue will therefore be, exceptionally for the 2020 edition, a unique but rich expression of the contributions of outstanding scientists from all over the world to the programme as we have conceived it for "EBEC Aix-en-Provence 2020".

Life on our planet is based on the availability of energy. This energy essentially comes from the electrochemical imbalance between strong metabolic reductants and the more oxidizing environment and from the imbalance of ATP with respect to its hydrolysis products ADP and inorganic phosphate. Although the intracellular energy vectors involved are very uniform, life has evolved a multitude of means and protein complexes to exploit the highly diverse environmental chemicals. After several decades of research, it has become obvious that the apparent "variability" of these energy converting systems, from bacteria to eukaryotic organelles such as mitochondria and chloroplast, is rather a "uniformity". The universality of the thermodynamic rules and molecular modules they use to capture and convert free energy from the environment has become evident. Today more than ever, the European Bioenergetics Conference series, by bringing together researchers of the "Mitochondria and pathologies" field but also of the "Photosynthesis" and the "Prokaryotic metabolisms" fields makes this universality a reality. The 36 contributions presented in this special issue will cover the whole range of Bioenergetics from environmental bacterial metabolisms to mitochondrial pathologies in humans through photosynthetic processes and from enzymatic mechanistic aspects to an integrated view of the whole cell. Different transversal themes will be addressed among them Evolution of bioenergetics (Oliver *et al.*), Cell Physiology and Pathologies (Alsayyah *et al.*; Macherel *et al.*; Rigoulet *et al.*; Zuhra *et al.*), Photosynthesis and its enzymes (Gorka *et al.*; Kleidon; Laughlin *et al.*; Messant *et al.*), Transporters and Channels (Austin and Nowikovsky; Guarino *et al.*; Gutiérrez-Aguilar; Neginskaya *et al.*), Biogenesis of Cofactors and Complexes (Abby *et al.*; Berndt *et al.*; Gupta and Becker; Oppermann *et al.*; Salinas *et al.*; Stephan *et al.*), Prokaryotic and Protists Metabolisms (Boughanemi *et al.*; Gawryluk and Stairs), Structure/Function relationship in Respiratory Complexes (Duarte *et al.*; Haapanen O. *et al.*; Lemaire and Wagner; Nikolaev *et al.*; Sousa *et al.*), Membrane and Complexes Dynamics (Pérez-Mejías G. *et al.*; Schlame M.; Weissert V. *et al.*), Supercomplexes (Cogliati S. *et al.*; Stuchebrukhov *et al.*) and Electron Bifurcating Enzymes (Appel *et al.*; Duan *et al.*; Wise *et al.*; Zuchan *et al.*).

At each EBEC, the Peter Mitchell Medal is awarded to a scientist in recognition of her/his contribution to the field of Bioenergetics. We are pleased to announce that Antony R. Crofts, from the University of Illinois, has been awarded with this Medal in 2020. Antony R. Crofts was one of the very first to not only understand and accept Mitchell's new chemiosmotic hypothesis shortly after it was proposed in the early 1960s, but also one of the very first to provide direct experimental support for the new hypothesis. Antony R. Crofts was thus truly deserving of the honour of the Peter Mitchell Medal. Unfortunately, as with all other oral contributions, we were deprived of his lecture. But Antony R. Crofts kindly agreed to write an amazing review on his 40 years of research devoted mainly to deciphering the intriguing Q-cycle mechanism of the cytochrome bc_1 complex, which has been included in this special issue (Crofts).

In 2020, the Bioenergetics community had to mourn the great loss of a distinguished scientist in Tomoko Ohnishi. She was a pioneer on EPR spectroscopic studies of respiratory chain enzyme complexes. We have published an obituary in her honour.

Barbara Schoepp-Cothenet graduated in Biochemistry from Montpellier SupAgro and AgroParisTech. She joined the André Verméglio's group at the CEA Cadarache, where she performed her PhD work on the structure and function of bc_1 complex in bacterial photosynthesis. Her work established for the first time the *in vivo* participation of the high-potential iron-sulfur protein HiPIP in bacterial photosynthesis. After being awarded with her PhD in Microbiology and Biochemistry by AgroParisTech in 1994, she spent several years of post-doc in multiple laboratories (Institut für Biologie II, Albert-Ludwigs Universität, Freiburg; Conservatoire National des Arts et Métiers, Paris; Centre de Génétique Moléculaire, CNRS, Gif / Yvette ; Bioénergetique et Ingénierie des Protéines Laboratory CNRS, Marseille). She has been recruited in 1999 in the "Evolution of Bioenergetics" group (Wolfgang Nitschke, CNRS, Marseille). Since 2018 she is head of this group which investigates the diversification and molecular evolution of the energy transducing systems from aerobic and anaerobic terminal reductases to photosynthetic enzymes through the Rieske/cyt*b* complex. She is particularly interested on Mo-enzymes and among them Mo-enzymes involved in arsenic and sulphur conversion.

Axel Magalon graduated in Microbiology at Aix-Marseille University in 1997. Dr. Magalon then joined the group of A. Böck at the Ludwig-Maximilians-University (Munich, Germany) as an Alexander von Humboldt postdoctoral fellow, where he contributed to the understanding of the intricate biogenesis pathway of [NiFe]-hydrogenases. In 2001, he obtained a permanent position as a CNRS research scientist at the Laboratoire de Chimie Bactérienne (Marseille, France). Since 2008, he is head of his group. His research is centered on the molecular and cell biology of respiration in Enterobacteriaceae, with an emphasis on molybdoenzymes ranging from maturation to reactivity and cellular organization questioning.

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