5th Joint Italian-German Purine Club Meeting

“Fostering translational research on Purines by Italian-German joint efforts”

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The Fifth Joint Italian German Purine Club Meeting was held in Rimini, Italy, from September 18 to 21, 2013. It followed the now well established tradition to organize these meetings alternatively in Italy or Germany. The venue of the Congress was the Palazzo Ruffi Briolini that is part of the Rimini Campus belonging to the University of Bologna and that was made available due to the great generosity and hospitality of Prof. Giovanni Matteucci, Head of the Department for Quality Life Studies at the same campus. During the Meeting the weather was beautiful and participating scientists were able to enjoy the city of Rimini, known as one of the pearls of the Adriatic Coast, not only for its beautiful beach but also for the many Roman remnants and ancient monuments one encounters when strolling through the city streets. More than 100 scientists participated in the conference, coming mostly from Italy or Germany, but also from other European (France, UK, Finland, Denmark) and extra-European (Brazil, Mexico) countries. As usual, the atmosphere was informal, allowing the participants working in different fields of purinergic signaling to start and/or strengthen their mutual relationships.

The Congress was opened by the presentation of the Fassina Award, established by the Italian Purine Club, to two distinguished scientists who had dedicated their scientific life to research in the field of purinergic signaling. At the previous meeting, the 4th Joint Meeting held in Bonn in 2011, the prize had been awarded to Peter Illes (University of Leipzig). This

year's recipients were Pier Andrea Borea (University of Ferrara) and Herbert Zimmermann (University of Frankfurt) whose research has had significant international resonance and has contributed to increasing the knowledge of the physiological and pathological roles of extracellular purines. The award was presented to Zimmermann in order to recognize his scientific merits related to his pioneering studies on ecto-enzymes, from their molecular identification to revealing their crucial involvement in the metabolism of extracellular purines and also their fundamental role in the development of nervous tissue. The award to Borea was granted for his pioneering studies on the activity of purinergic ligands of adenosine receptors, especially in the field of inflammation and cancer. Subsequently, Francesco Di Virgilio (Ferrara) and Niklas Reye Jørgensen (Denmark) presented moving commemorations of the recently deceased Tom H. Steinberg, Associate Professor of Medicine at the School of Medicine's Division of Infectious Diseases, Washington University, St. Louis (Mo, USA), who has greatly contributed to elucidating the role of P2 receptors in cells of the mononuclear phagocyte lineage. Following up on another well established custom, Geoffrey Burnstock (London) presented the introductory plenary lecture providing a detailed and updated account of the multiple pathophysiological roles of ATP and other nucleotides acting on specific P2 receptors subtypes in the various human tissues and organs.

A major part of the oral communications dealt with the role of nucleotides and the physiological and pathological consequences of stimulating individual P2X and P2Y subtypes. Thus, we listened to excellent talks on the role of ATP in cancer and inflammation (see abstracts related to the oral communications by F. Di Virgilio, G. Reiser and S. Zimbone in symposium 1 and by F. Haag, E. Adinolfi and B. Strlic in symposium 7). Also the oral communications presented in symposia 2 and 3 concerning the medicinal chemistry and structural studies of purinergic receptors focused for most part on ATP/P2 receptors. The need of new compounds acting as specific ligands on the

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different subtypes of these receptors became conspicuous. The role of ATP as an important trophic factor for the developing brain was emphasized in symposium 4 by the talks presented by H. Ulrich, S. Ceruti and I. Milenkovic, whereas, in the same symposium, P. Illes pointed out the potential of ATP to cause cell death by interacting with P2X₇ receptors. Z. Gerevich (symposium 5) elaborated the opposite roles of P2X₂ (and/or P2X₄) and P2Y₁ receptors on gamma oscillations in the hippocampus, with possible implication of these receptors in the treatment of schizophrenia or cognitive disorders, as well as a minor role of the P2X₇ receptor in increasing the amplitude of epileptic discharges in the medial entorhinal cortex, implicating a putative anticonvulsive effect of P2X₇ receptor antagonists. In symposia 8 and 9, dedicated to the activity of purines in peripheral tissues, the effects of ATP acting on the P2X₇ receptor or on different subtypes of P2Y receptors were reported for osteoblasts, cardiac myocytes, platelets and pancreatic cells (see the abstracts by A. Gartland, J. Neumann, I. von Kügelgen, T. Schöneberg and N. R. Jørgensen, respectively). Important additional aspects of the activity of P2 receptors in heart, bone and liver were highlighted in the plenary lecture presented by J.-M. Boeynaems. Another focus concerned the activity of ecto-enzymes regulating the levels of extracellular nucleotides and nucleosides. A comprehensive overview on ecto-nucleotidases was presented by G. Yegutkin in his plenary lecture. M. Schmelze discussed the role of ecto-nucleotidase-bearing plasma microparticles in liver disease whereas N. Sträter reported his pioneering structural studies on human CD73 (ecto-5'-nucleotidase) and their implication for the design and synthesis of new inhibitors.

A fair number of oral communications had its focus on the activity of purinergic compounds on adenosine receptors. In symposium 2, P.G. Baraldi reported on the activity of new compounds acting as selective antagonists of human A₃ receptors whereas M. Koussemou depicted the effects of old and new agonists and antagonists of A_{2B} receptors on classical intracellular signaling pathways such as activity of adenylate cyclase, Ca²⁺ mobilization and ERK1/2 phosphorylation. The role of adenosine receptors was addressed mainly regarding their function in the central nervous system (CNS). E. Coppi (symposium 4) reported an inhibitory effect exerted by the activation of A_{2A} receptors on the differentiation of oligodendrocyte precursor cells that was opposite to that induced by the P2Y-like GPR17 receptors. Also the oral communications of symposium 5 were almost all devoted to the effects exerted by adenosine and related compounds in the CNS under physiological (C. Lohr) or pathological conditions (D. Blum, S. Gessi, A. Martire and G. Baier-Bitterlich). Additional interesting talks were given by M. Zuccarini (symposium 6) who presented important new findings on the existence of a soluble purine nucleoside phosphorylase (PNP) that contributes to the modulation of the levels of extracellular nucleosides and related metabolites, and by A. Pfeifer and C. Giacomelli (symposium 8) who highlighted the influence

of adenosine on adipocytes deriving from brown adipose tissue and on mesenchymal stem cells differentiating into osteoblasts, respectively.

Another interesting aspect concerned two reports on the recent funding of “purinergic” research programs by the European Community. F. Koch-Nolte and M. P. Abbracchio presented projects supported by the ERA-net Neuron Consortium. The first project (Koch-Nolte) entitled “Nanostroke: role of danger signals in stroke and therapeutic targeting by nanobodies” brings together researchers from Italy, Germany and Spain, some of whom will explore purinergic danger signals in vivo and the effect of related nanobody treatment on brain tissue repair. The project illustrated by M.P. Abbracchio is entitled “Restoring function in stroke via GPR17, a new receptor involved in adult brain self-repair”. This project also includes Italian, German and Spanish scientists who set out to establish a reparative role of the recently identified GPR17 receptor in stroke, using several in vitro and in vivo models and advanced molecular biology and imaging techniques.

In addition to the oral communications, considerable time was allotted to the poster exhibitions. An Italian-German committee examined the posters and interviewed the presenters to identify the four best Italian and German contributions, respectively. The award ceremony was held during the social dinner. Poster prizes were awarded to (in alphabetic order): M. Boccazzi (Milan, Italy), M. Capece (Ferrara, Italy), A. Lannutti (Chieti, Italy), J. Meister (Leipzig, Germany), Anja Pippel (Halle, Germany), K. Rozmer (Leipzig, Germany), Anke C. Schiedel (Bonn, Germany), and Ajiroghene Thomas (Camerino, Italy).

The announcement of future meetings at the end of the conference can be regarded as the best testimony of the vitality of this area of research. C. Müller will be organizing the next International Purine Meeting “Purines 2014” in Bonn that is open to scientists worldwide. F. Knock-Nolte and his colleagues from Hamburg expressed their intention to organize the 6th Joint Italian-German Purine Club Meeting in Hamburg in 2015 and, finally, H. Ulrich offered to organize the International Purine Meeting “Purines 2018” in Brazil, a meeting to follow “Purines 2016” organized by K. Jacobson in the USA.

In our opinion, a particular merit of this kind of meetings is their sufficiently small size that allows participants to attend every session without overlap. As reported by many scientists during the meeting, they greatly gained from the opportunity to obtain a broad overview of the current development of the purinergic field. This was of considerable advantage especially for the young researchers. Another relevant aspect concerned the high scientific quality of the oral communications that often stimulated passionate and exciting discussions. The Organizing Committee of the Congress and the authors of this report warmly thank all scientists for their highly qualified and active participation that made the 5th Joint Italian-German Purine Club Meeting in Rimini a great success.