International Conference on Purinergic Drugs and Targets—4th Joint German–Italian Purine Club Meeting, Bonn, Germany, July 22–25, 2011

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The Fourth Joint German–Italian Purine Club Meeting was organized by Christa Müller and colleagues at the Pharmaceutical Institute of the University of Bonn from July 22 to 25, 2011. It was during the congress of Medicinal Chemistry and Pharmacology of Purinergic Receptors organized in September 2003 in Camerino that the idea was put forward to establish joint Italian–German meetings to be held every second year—alternatively in Italy and in Germany. This was happily accepted by the members of the two Purine Clubs and the first meeting of this series was held in 2005 in Chieti (Italy), organized by Francesco Caciagli and his team. The second meeting was organized in 2007 in Leipzig (Germany) by Peter Illes and colleagues, the third one in 2009 in Camerino by Gloria Cristalli and co-workers, and now the meeting has returned to Germany. Over the years, these meetings have been very instrumental in intensifying the already close scientific interactions

between Italian and German researchers. The number of common publications of scientists from the two countries in the purinergic field is impressive. At the same time, these meetings are open to international scientists and have developed increasing attraction to scientists worldwide. Approximately 250 delegates from 21 countries attended the conference, with German and Italian scientists in the majority.

The meeting started in the baroque Castle Poppelsdorf which became part of the university at the occasion of its foundation in 1818. It has, by now, become a lovable ritual that Geoffrey Burnstock from the Royal Free and University College Medical School of London and scientific mentor of the field sets the stage for these meetings. His inspiring plenary lecture focussed on the pathophysiology of purinergic signalling and the development of therapeutic targets with an emphasis on novel developments in the treatment of various states of pain, in particular, in long-term neuropathic pain, inflammation, and acute pain. This included his new ideas on the involvement of purinergic signalling in the beneficial effects of acupuncture that are now addressed experimentally. The second plenary speaker, Maria Teresa Miras-Portugal from the Biochemistry Department, Veterinary Faculty, University Complutense of Madrid (Spain) gave an excellent overview of functional roles of P2X7 receptors in the central nervous system. While it has been debated for long whether this receptor is significantly expressed in neurons, a considerable number of studies (many important ones from her group) have now provided unequivocal evidence for a role of this receptor not only in glial but also in neuronal function. She focussed on recent studies demonstrating that ATP, via the activation of growth cone-located P2X7 receptors, inhibits the outgrowth of cultured hippocampal neurons—an effect that is counteracted by the ATP-hydrolyzing enzyme alkaline phosphatase. Also in mature neurons P2X7

All abstracts of posters presented at the meeting and of the oral presentations are contained in this issue of *Purinergic Signalling*.

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receptors are terminally located whereby they can induce exocytotic transmitter release.

Next day, the meeting was continued in the building of the Pharmaceutical Institute of the University in Bonn-Endenich with ten consecutive oral sessions (45 lectures) and two extended poster sessions. Sessions included the following topics: (1) New insights into P2X7 receptor research, (2) Structure and function of purine receptors, (3) Purine receptors as emerging targets for drug development, (4) Purinergic signalling in neural development, (5) Medicinal chemistry, (6) Purinergic signalling in inflammation and cancer, (7) Purinergic signalling in the CNS I, (8) Purinergic signalling in the CNS II, (9) P2Y receptors, and (10) Nucleotide-metabolizing enzymes. The sessions covered the broad field of signalling via adenosine and nucleotides, including basic molecular and cellular mechanisms, their physiological and pathological implications and the development of compounds, as well as strategies to specifically interfere with these pathways. The understanding of basic mechanisms underlying purinergic signalling has now been developed to a stage that allowed the development of several novel drugs which are now in clinical development or already on the market. Medicinal chemistry and the targeting of purine receptors have thus emerged as central topics of this meeting. This was flanked by novel structural data of the relevant receptors but also of the ectonucleotidases

that can equally be targeted in defined pathological conditions. The closing plenary lecture was presented by Nicholas Dale from the School of Life Sciences, University of Warwick, Coventry, UK. Nick Dale is known to all scientists in the field for his development of biosensors for the measurement of extracellular adenosine and ATP concentrations and also of other metabolites and the excellent work resulting from the application of these tools. In his overview, he addressed two basic mechanisms of chemosensitivity in the brain, the sensing of the CO₂ partial pressure in the control of breathing in the basal brain stem and a novel form of glucose sensing by hypothalamic tanycytes. In both cases, glial cells play a central role in transducing external signals within the brain via an ATP-mediated mechanism. The targeting of the sensors at the molecular level and of the molecular transduction mechanism that eventually induce cellular release of ATP is a challenging and novel field of neuroscience.

At the conference dinner, overlooking the river Rhine, eight poster prizes were awarded to young scientists for their excellent scientific achievements by the German and Italian Purine Clubs. These were Wolfgang Fischer, University of Leipzig; Ayman Geddawy, Shiga University Japan; Dong Guo, Leiden University; Sara Gulinelli, University of Ferrara; Annette Viktoria Hinze, University of Bonn; Karina Kaczmarek, Max-Planck Institute Göttingen; Soroush Nader, University of Hamburg; and Sabrina Taliani, University of Pisa.