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Editorial

# From molecular mechanisms to functional impact: Developing integrated analyses in neurotoxicology - The 16th biennial meeting International Neurotoxicology Association and 8th meeting of the NeuroToxicity Society

The neurotoxicological landscape is steadily evolving. In the early years, neurotoxicological research focused strongly on clearly distinct disciplines, covering a spectrum from neuro-epidemiology, through neuropathology and *in vivo* neurobehavioral research to mechanism-based *in vitro* neurotoxicological research. Within each of these disciplines, there has been a clear need and development towards integration of different endpoints, which has resulted in e.g. neurobehavioral test batteries or *in vitro* integrated test strategies.

However, to truly understand the neurotoxic effects of a particular exposure it is simply not sufficient to only integrate several endpoints within a particular discipline. Rather, a full integration of the different disciplines within neurotoxicology is required to connect the cellular and molecular mechanism of a neurotoxicant to adverse outcomes in *in vivo* animal experiments, and ultimately to the human population.

This view was perfectly reflected in the theme of the 16th biennial meeting International Neurotoxicology Association (INA): From molecular mechanisms to functional impact: Developing integrated analysis in neurotoxicology.

For the first time in its almost 30 years of history, the INA met in South America together with the NeuroToxicity Society (NTS). The meeting was held in beautiful Florianopolis, Brazil, from May 20–23, 2017. With close to 200 attendees from around the globe, the organizing committee consisting of Drs. Gustavo Ferreira (Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil), Alexandra Latini (Universidade Federal de Santa Catarina, Florianópolis, SC, Brazil), Maria-Trinidad Herrero (University of Murcia, Spain), G. Jean Harry (National Institute for Environmental Health Sciences, Research Triangle Park, NC, USA) and Edward D. Levin (Duke University, Durham, NC, USA) can look back at a successful meeting!

This well-attended meeting hosted over 90 talks, including the INA 2017 Jacob Hooisma Lecture given on Saturday by Dr. J. Timothy Greenamyre (University of Pittsburgh, PA, USA) on Parkinson's disease: At the intersection of genes and environment. In the successive days, parallel sessions covered a broad range of topics including sensory toxicity, neuroinflammation, neurodegeneration and Parkinson's Disease, neuroprotection and therapeutic drugs, antibiotics and viruses in neurological diseases, neurotoxicology of abused drugs and New Psychoactive Substances, mitochondrial mechanisms, metabolic disorders, autism, impacts of early life stress, and Integrated Testing Strategies.

In addition to the oral sessions, more than 80 posters were presented during the poster session on Sunday. A large fraction of these posters were presented by scientists from Brazil, including a considerable number of young scientist that could win one of the six Best Poster Presentation Awards. Candidates were judged by Drs. Ed Levin, Miki Aschner and Monica Bastos and the winners were announced at the awards dinner on Tuesday and received their award from Maria-Trinidad Herrero (past president NTS), Monica Bastos (past president Brazilian Society of Toxicology) and Remco Westerink (president INA). Congratulation to Beatriz Thomasi, Hercules Freitas, Debora da Luz Scheffer, Igor Ferraz da Silva, Filipe de Araujo and Stella Junqueira on winning this award!

Another event that was obviously dominated by our young scientists was the Joint Student Award Symposium on Monday afternoon. As the name already implies, the speakers in this symposium were young scientists who received one of the five travel awards. Candidates had been judged on the quality of the abstract by Christoph van Thriel, Jean Harry, Ed Levin. This year winners were Jenna Strickland (Michigan – USA), Anke Tukker (Utrecht, the Netherlands), Tanara Peres (NY - USA), Adel Jungling (Pecs – Hungary) and Emmanuel Casanova Ortiz (Santiago – Chile). Winning one of these travel awards is of course great fun and an important recognition for the work performed, but for young scientists it is often also a financial necessity to be able to attend our meetings. We are therefore extremely grateful to the meeting sponsors that enabled us to generate these travel awards: Agilent/Seahorse, Alesco, American Society for Neurochemistry, Axion BioSystems, Axol Bioscience, Cellular Dynamics International, Conselho Nacional de Pesquisa e Desenvolvimento Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Elsevier, International Society for Neurochemistry, Mimetas, National Institute for Environmental Health Sciences, and Springer Publishing Company.

In addition to travel and best poster awards, there was one even more important award: the prestigious David Ray Award. Dr. David Ray of Nottingham was a former INA president and teacher of many PhD students. He regrettably passed away much too early in 2010. David was an outstanding neurotoxicologist as well as an active and enthusiastic INA member. When he died, INA lost a valuable promoter of neurotoxicology. To keep the memory of David Ray alive, the David Ray Student Travel Award was inaugurated at the 25th anniversary of INA at INA-14 in The Netherlands (2013). This year's finalists for the award were Jenna Strickland (Michigan – USA) and Anke Tukker (Utrecht, the Netherlands). They were selected based on their CV and abstract by the first-tier judges Drs. Ed Levin, Sandra Ceccatelli and Marcel Leist. Both students presented their work at the meeting and were evaluated by a second set of judges consisting of Drs. Will Boyes, Anna Price and Cristina Suñol. However, despite the abundance of

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judges, it was a tie… So, for the first time in its short history, the David Ray Award had to be split between both candidates as they both deserved to win this prominent award. Congratulations to both!

Just as the meeting itself, this special issue of INA-16 perfectly documents the goal of the International Neurotoxicology Association, i.e., to promote scientific knowledge regarding the action of toxic agents on the nervous system.

This is clearly reflected by the 21 scientific papers, including 6 review articles, of this special issue that describe the full span of neurotoxicological research. The 15 research articles provide insights into adverse effects of mercury exposure in humans, developmental neurotoxicity and neurodegeneration *in vivo* models of rodent, zebrafish and *C. elegans*, and *in vitro* techniques and models to provide data for risk assessment and basic research. Many of these articles contribute to the urgently needed integration of different neurotoxicological disciplines and link molecular and/or cellular events to adverse outcomes, including neuroinflammation.

The closure of this special issue is by no means the end of the INA tradition. Local organizers Drs. Ellen Fritsche and Christoph van Thriel (past INA president 2013–2015) are already working vigorously with Dr. Remco Westerink (current INA president 2017–2019) to host the next INA meeting in 2019. The 17$^{th}$ Biennial Meeting of the International Neurotoxicology Association will take place in Dusseldorf (Germany), from September 29$^{th}$ until October 3$^{rd}$, 2019. All dates and details can be found in due time on our website: www.neurotoxicology.org.

We hope to see you there!

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