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NeuroToxicology



Meeting Report

Neurodevelopmental basis of health and disease The 14th Meeting of the International Neurotoxicology Association



Overview: The 14th meeting of the International Neurotoxicology Association (INA 14) was held June 9–13, 2013 at the Hotel and Conference Center Zuiderduin in Egmond aan Zee, The Netherlands. Eighty-three visitors – including 12 students – originating from 11 European countries, 2 North American, 3 Asian and 1 Oceanian country participated in the conference. INA 14 focused on the theme of ‘*Neurodevelopmental Basis of Health and Disease*’.

Scope of the Conference: Developmental neurotoxicology and its potential health effects for the human population formed the center of attention during this conference. Also, alternative (animal free) testing approaches and innovative non-invasive technologies improving animal welfare in preclinical neurotoxicology research – without giving in on the safety of man – received lots of interest. The complete program and all abstracts are published on the websites of respectively the International Neurotoxicology Association (INA) (www.neurotoxicology.org) and NeuroToxicology (<http://www.journals.elsevier.com/neurotoxicology>).

Sponsors/Exhibitors: The generous support of those who made this international conference possible is gratefully acknowledged. (Listed in section ‘Sponsors & Exhibitors’).

Educational Partners: The support of the Institute for Risk Assessment Sciences (IRAS), Utrecht University, Utrecht, The Netherlands (Remco Westerink) and the Netherlands Organization for Applied Scientific Research TNO, Zeist, The Netherlands (Didima de Groot, Jan Lammers) is much appreciated.

Scientific Advisory Committee/Sparring partners/Session Chairpersons: We especially would like to recognize the Scientific Advisory Committee and Session Chairpersons for their expert advice and assistance in either outlining the research program, identifying world-wide experts, formulating topics for discussion, serving as stimulating session chairs and/or delivering a well-prepared plenary or research presentation. Special thanks go to Prof. Dr. Donald A. Fox (Past-President INA) and Dr. Christoph van Thriel (President-Elect INA). Also to Dr. Niek Snoeij (TNO, The

Netherlands) and Dr. Erik de Vries (University Medical Center Groningen, The Netherlands); their encouragement and support especially during the very early hours of conference organization have been decisive for the Local Organizers to take on this job to organize the 14th INA conference and celebrate INA’s 25th anniversary ‘back home’ in The Netherlands.

Student Competition and Awards: Special emphasis was placed on nurturing, recognizing and rewarding pre-doctoral students and young investigators. Six of the student abstracts were selected for oral presentation in the new David Ray Competition and Award and were refunded for complete or partial travel expenses. Three poster presentations were awarded. All winners received a certificate to the Award (Listed in Section ‘Award Winners’).

Judges for Student Competition and Awards: On behalf of the students: many thanks to the judges for their expert efforts in the Student Competition and Awards!

Conference Staff: On behalf of all Conference participants we express our gratitude and appreciation to all individuals who worked hard before, during and after this meeting to ensure that everything ran smoothly and all details were attended to. We also like to mention the assistance of the students of Remco Westerink’s team (Utrecht University, The Netherlands) taking excellent care of audio/visuals during the conference. We received photographs of the conference for the picture collages of the meeting from different participants, especially Harm Heusinkveld (Utrecht University, The Netherlands). Furthermore, we like to mention the original photography and artwork of conference and program flyers which was in the hands of respectively Marlies Otto and Roderick Slieker (TNO, Zeist, The Netherlands).

Technical Secretariat: The secretariat was in the hands of Bastiaanse Communication (Bosch en Duin, The Netherlands). We acknowledge the professional, experienced and diligent support of Mrs. Helena Bastiaanse (www.bastiaanse-communication.com).

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Student Award Winners

*14th Meeting of the International Neurotoxicology Association
Neurodevelopmental Basis of Health and Disease
June 9-13, 2013
Egmond aan Zee, The Netherlands*



DAVID RAY AWARD WINNER

Anne K. Krug – Title: *“Integrating transcriptomics and metabolomics to identify new pathways of toxicity of the Parkinsonian toxin MPP⁺”*. Mentor: Marcel Leist, University of Konstanz, In Vitro Toxicology and Biomedicine, Germany

ORAL PRESENTATION AWARD WINNERS

Martin Schmuck, – Title: *“Novel computational approaches for high content image analyses (HCA) of organoid neurosphere cultures allowing medium-throughput DNT testing in vitro”*. Mentor: Ellen Fritsche, IUF - Leibniz Research Institute of Environmental Medicine, Germany.

Hester Hendriks, – Title: *“In vitro neurotoxic hazard characterization of brominated and halogen-free flame retardants”*. Mentor: Remco Westerink, Utrecht University, Institute for Risk Assessment Sciences, The Netherlands.

Jenny Bauman, – Title: *“Neurospheres as a predictive 3D in vitro model for DNT testing and pathway investigation in a species-specific context”*. Mentor: Ellen Fritsche, Leibniz Research Institute for Environmental Medicine, Germany.

Marieke Meijer, – Title: *“Low concentrations of organophosphates induce acute and concentration-dependent effects on calcium homeostasis in PC12 cells”*. Mentor: Remco Westerink, Utrecht University, Institute for Risk Assessment Sciences, The Netherlands.

Vanessa Hausherr, – Title: *“TOCP impairs glutamate signaling of central nervous system neurons”*. Mentor: Christoph van Thriel, IfADo - Leibniz Research Center for Working Environment and Human Factors, Germany.

POSTER AWARD WINNERS

A. De Felice, First Place Winner – Title: *“Sex-dimorphic behavioral and neuroendocrine effects of the organophosphate chlorpyrifos in a mouse model of autism spectrum disorders”*. Mentor: Gemma Calamandrei, Istituto Superiore di Sanità, Department of Cell Biology and Neuroscience, Italy.

F. Peris, Second Place Winner – Title: *“Chronic oral exposure to low doses of clorpyrifos differentially affects physical and behavioral endpoints in ApoE2, ApoE3 and ApoE4 transgenic mice.”* Mentor: M.T. Colomina^{1,2}, ¹Universitat ‘Rovira i Virgili’, Laboratory of Toxicology and Environmental Health, School of Medicine, IISPV, Spain; ²Universitat ‘Rovira i Virgili’, Department of Psychology and Research Center in Behavioral Assessment (CRAMC), Department of Psychology, Spain.

Martje WGDM de Groot, Third Place Winner – Title: *“Chemically induced aging of PC12 cells to study in vitro neurodegeneration.”* Mentor: Remco Westerink, Utrecht University, Institute for Risk Assessment Sciences, The Netherlands.

Congratulations to all winners!

Chair, Local & Scientific Committees

14th Meeting of the International Neurotoxicology Association Neurodevelopmental Basis of Health and Disease

June 9-13, 2013

Egmond aan Zee, The Netherlands



CONFERENCE CHAIR

Prof.dr. Jordi Llorens, University of Barcelona, Spain (chair)
INA President 2011-2013

LOCAL ORGANISING COMMITTEE

Dr. Didima de Groot, TNO, The Netherlands (chair)
Dr. Jan Lammers, Dutch Health Care Inspectorate, The Netherlands
Dr. Remco Westerink, Utrecht University, The Netherlands

Prof.dr. Donald A. Fox, University of Houston, USA
INA President 2011-2013

SCIENTIFIC COMMITTEE

Prof.dr. Jordi Llorens, University of Barcelona, Spain (chair)
Dr. Kevin M. Crofton, U.S. Environmental Protection Agency, USA
Prof.dr. Donald A. Fox, University of Houston, USA
Dr. Didima de Groot, TNO, The Netherlands
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Dr. Anna Price, European Union Reference Laboratory for Alternative Methods to Animal Testing (EURL-ECVAM), Italy
Dr. Diane Rohlman, Oregon Health & Science University, USA
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Dr. Erik de Vries, University Medical Center Groningen, The Netherlands
Dr. Remco Westerink, Utrecht University, The Netherlands

Sponsors & Exhibitors

*14th Meeting of the International Neurotoxicology Association
Neurodevelopmental Basis of Health and Disease
June 9-13, 2013
Egmond aan Zee, The Netherlands*



THE EUROPEAN UNION REFERENCE LABORATORY
FOR ALTERNATIVES TO ANIMAL TESTING

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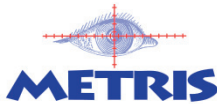
Oklahoma State University, USA

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Seahorse Bioscience Europe Aps., Denmark

Society of Toxicology, USA

TNO, The Netherlands



Many thanks for all the support!

Scientific program and events of INA-14

*14th Meeting of the International Neurotoxicology Association
Neurodevelopmental Basis of Health and Disease
June 9-13, 2013
Egmond aan Zee, The Netherlands*

Opening of the conference and welcome

Jordi Llorens, Universitat de Barcelona, Hospitalet de Llobregat, Spain

Didima de Groot, TNO, The Netherlands

Niek Snoeij, TNO, The Netherlands



Jacob Hooisma Lecture:

Neurotoxin discovery and disease prevention

Peter S. Spencer, Oregon Health & Science University, USA

Symposium 1:

In vivo and in vitro neurotoxicological approaches to study pathways of neurodegeneration

Tomás Guilarte, Columbia University, Department of Environmental Health Sciences, USA

Remco Westerink, Utrecht University, Institute for Risk Assessment Sciences, The Netherlands

Symposium 2:

Synaptic development and degeneration following early neurotoxicant or stress exposure

Didima de Groot, TNO, the Netherlands

Pamela J. Lein, University of California, Davis, USA

Student Symposium 1

Christoph van Thriel, IfADo - Leibniz Research Centre for Working Environment and Human Factors, Germany

Jordi Llorens, Universitat de Barcelona, Hospitalet de Llobregat, Spain

Symposium 3:

Human stem cell-based test systems for developmental neurotoxicity testing

Ellen Fritsche, University of Düsseldorf, Leibniz Research Institute for Environmental Medicine, Germany

Marcel Leist, University of Konstanz, In Vitro Toxicology and Biomedicine, Germany

Symposium 4:

*Genetic modulation of neurotoxicity and neuroprotection:
state-of-the-art developments surveying select neurotoxins*

Michael Aschner, Vanderbilt University Medical Center, USA
Sandra Ceccatelli, Karolinska Institutet, Department of Neuroscience, Sweden

Poster session 1

Symposium 5:

What is hot in 2013?

Remco Westerink, Utrecht University, Institute for Risk Assessment Sciences, the Netherlands
Anna Price, Institute for Health and Consumer Protection (EC JRC), European Union Reference Laboratory for Alternative Methods to Animal Testing (EURL-ECVAM), Italy

Excursion Amsterdam, INA's (beach) soccer, Beach BBQ

Symposium 6:

Interaction of age, toxicity and disease in sensory decline

Jordi Llorens, Universitat de Barcelona, Hospitalet de Llobregat, Spain
Esther Udina, Universitat Autònoma de Barcelona, Spain

Student Symposium 2

Christoph van Thriel, IfADo - Leibniz Research Centre for Working Environment and Human Factors, Germany
Jordi Llorens, Universitat de Barcelona, Hospitalet de Llobregat, Spain

Symposium 7:

Molecular and cellular approaches for developmental neurotoxicity testing

Anna Price, Institute for Health and Consumer Protection (EC JRC), EU Reference Laboratory for Alternative Methods to Animal Testing (EURL-ECVAM), Italy
Christoph van Thriel, IfADo - Leibniz Research Centre for Working Environment and Human Factors, Germany

Symposium 8:

*Mechanisms for pesticide-induced developmental neurotoxicity:
alternatives to acetylcholinesterase inhibition*

Ginger Moser, U.S. Environmental Protection Agency, USA
Carey Pope, Oklahoma State University, USA

Poster session 2

Symposium 9:

Neurotoxicological consequences of exposure to urban air pollution

Philip J. Bushnell, Neurotoxicology and Teratology, USA
Michelle Block, Virginia Commonwealth University, Medical Center, USA

Symposium 10:

Application of cell-based and non-mammalian models to chemical screening

Milou Dingemans, Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
Tim Shafer, U.S. Environmental Protection Agency, USA

Closing remarks and farewell

Didima de Groot, TNO, The Netherlands

Christoph von Thriel, IfADo - Leibniz Research Centre for Working Environment and Human Factors, Germany
Ed Levin, Duke University Medical Center, Psychiatry and Behavioral Sciences, USA

List of Lectures and Poster presentations of INA-14

14th Meeting of the International Neurotoxicology Association Neurodevelopmental Basis of Health and Disease June 9-13, 2013 Egmond aan Zee, The Netherlands



JACOB HOOISMA LECTURE

Neurotoxin discovery and disease prevention

Peter S. Spencer

Oregon Health & Science University, USA



LECTURES:

Symposia (S) and Student Symposia (StS)

- S1.1 *Introduction into the research area: In vivo and in vitro neurotoxicological approaches to study pathways of neurodegeneration*
Remco H. Westerink
Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- S1.2 *The use of non-human primates in neurotoxicology research*
Tomás R. Guilarte
Columbia University, Department of Environmental Health Sciences, USA
- S1.3 *Studies on neurodegeneration in C. elegans*
Pan Chen
Vanderbilt University Medical Center, USA
- S1.4 *Use of in vitro dopaminergic neuronal cell models for oxidative signaling and translational discovery*
Anumantha Kanthasamy and Arthi Kanthasamy
Iowa State University, Iowa Center for Advanced Neurotoxicology, USA
- S1.5 *In vitro assessment of Parkinsonian neurodegeneration by dinitrophenolic herbicides in PC12 cells*
Harm J. Heusinkveld¹, A.C. van Vliet¹, P.C. Nijssen² and R.H. Westerink¹
¹Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
²Elisabeth Hospital, Department of Neurology, the Netherlands
- S2.1 *Aluminum exposure from developmental to mature brain: long-term implications on neurodegenerative injury*
Qiao Niu
Shanxi Medical University, Department of Occupational Health, China

- S2.2 *Cellular, molecular and functional alterations in synaptic function following perinatal exposure to methylmercury*
Didima de Groot¹, C. de Esch¹, C. F. Kuper¹, R. Stierum¹, A. Wolterbeek¹, E. F.J. de Vries², A. van Waarde², R.A.J.O. Dierkx², W.J. Wadman³, N.L. Cappaert³ and M. Radonjic¹
¹TNO, the Netherlands
²University Medical Center Groningen, The Netherlands
³University of Amsterdam, The Netherlands
- S2.3 *Early life stress immunologically primes the synaptic spine for late-onset degeneration: relevance for neurotoxicity*
Barbara Viviani¹, M. Boraso¹, M. Valero², F. Gardoni¹, E. Marco², M. Di Luca¹, M. Marinovich¹, M. López-Gallardo² and M. Viveros²
¹University of Milan, Dipartimento di Scienze Farmacologiche e Biomolecolari, Italy
²Complutense University of Madrid, Departamento de Fisiología, Spain
- S2.4 *Perinatal PCB exposure disrupts neuronal connectivity in the developing brain*
Pamela J. Lein
 University of California, Davis, USA
- StS1.1 *Novel computational approaches for high content image analyses (HCA) of organoid neurosphere cultures allowing medium-throughput DNT testing in vitro*
Martin Schmuck¹, T. Temme¹, J. Baumann¹, K. Dach¹, T. Glasmachers², A. Mosig² and E. Fritsche¹
¹IUF - Leibniz Research Institute of Environmental Medicine, Germany
²Ruhr-University Bochum, Department of Biophysics, Bioinformatics, Germany
- StS1.2 *Integrating transcriptomics and metabolomics to identify new pathways of toxicity of the parkinsonian toxin MPP⁺*
Anne K. Krug¹, C. Kullmann¹, D. Pörtl¹, L. Zhao² and M. Leist¹
¹University of Konstanz, In vitro toxicology and biomedicine, Germany
²The Johns Hopkins University, Baltimore, USA
- StS1.3 *In vitro neurotoxic hazard characterization of brominated and halogen-free flame retardants*
Hester S. Hendriks and R.H. Westerink
 Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- S3.1 *Transcriptional and epigenetic profiling of neurodevelopmental toxicant effects in hESC-based developmental neurotoxicity test systems*
Marcel Leist
 University of Konstanz, In Vitro Toxicology and Biomedicine, Germany
- S3.2 *NPC-derived neurospheres serve as pathway-based test systems for early neurodevelopmental toxicity: an interspecies comparison of toxicity pathways*
Ellen Fritsche, M. Barenys, J. Baumann, K. Dach, K. Gassmann, M. Schmuck and Janette Schuwald
 IUF - Leibniz Research Institute for Environmental Medicine, Germany
- S3.3 *Using human pluripotent stem cells to probe vulnerability of the developing human neural system to environmental insults*
Steve Stice
 University of Georgia, Regenerative Bioscience Center, USA
- S4.1 *Manganese neurotoxicity: from worms to neonates*
Michael Aschner, J.L. Aschner and N.L. Maitre
 Vanderbilt University Medical Center, Department of Pediatrics, USA
- S4.2 *Gender modulation of paraoxonase-2 (PON2) neuroprotection*

Lucio G. Costa^{1,3}, G. Giordano¹, T.B. Cole^{1,2} and C.E. Furlong²

¹University of Washington, Department of Environmental and Occupational Health Sciences, USA

²University of Washington, Division of Medical Genetics and Department of Genome Sciences, USA

³University of Parma, Department of Neuroscience, Italy

- S4.3 *Neural cells' susceptibility to oxidative stress is influenced by exposure to adverse conditions during development*
Sandra Ceccatelli
 Karolinska Institutet, Department of Neuroscience, Sweden
- S4.4 *Developmental lead neurotoxicity: genetic mechanisms and lasting impacts on the adult nervous system*
Jennifer L. Freeman
 Purdue University, School of Health Sciences, USA
- S5.1 *Early childhood environmental lead exposure and adult mental health problems – the Port Pirie cohort study*
Amelia Searle¹, A. McFarlane¹, M. Van Hooff¹, P. Baghurst², M. Sawyer³, C. Galletly⁴, M. Sim⁵ and L. Clark⁶
¹University of Adelaide, Centre for Traumatic Stress Studies, Australia
²University of Adelaide, Public Health Research Unit, Women's and Children's Health Network; and Disciplines of Paediatrics and Public Health, Australia
³University of Adelaide, Research and Evaluation Unit, Women's and Children's Health Network; and Discipline of Paediatrics, Australia
⁴University of Adelaide, Discipline of Psychiatry, Australia
⁵Monash University, Department of Epidemiology & Preventive Medicine, Australia
⁶Flinders University, Psychology Clinic, Australia
- S5.2 *High susceptibility of developing brain cells to the environmental pollutant paraquat – an early initiation to development of neurodegenerative disease?*
Jenny Sandström von Tobel, J. Althaus, J. Mermoud and F. Monnet-Tschudi
 University of Lausanne, Department of Physiology, Switzerland
- S5.3 *Using zebrafish as a model for investigating persisting neurobehavioral toxicity*
Edward D. Levin
 Duke University Medical Center, Psychiatry and Behavioral Sciences, USA
- S5.4 *Neurodevelopmental toxicity of epigallocatechin gallate (EGCG): effects in rats *in vivo* and mechanistic studies in human and rat neurospheres *in vitro**
Marta Barenys¹, K. Gassmann¹, C. Baksmeier¹, S. Heinz¹, I. Reverte², M.T.Colomina² and E. Fritsche¹
¹IUF - Leibniz Research Institute of Environmental Medicine, Germany
²Rovira i Virgili' University, Psychobiology Unit, School of Psychology, Spain
- S5.5 *Chronic methylphenidate (MPH) administration and cognitive function in juvenile rhesus monkeys*
Merle G. Paule, M. Li, M.P. Gillam and X. Zhang
 FDA, National Center for Toxicological Research, Division of Neurotoxicology, USA
- S5.6 *Consequences of a gestational and lactational exposure to a 16 polycyclic aromatic hydrocarbon mixture on social behavior of adult rats measured in the complex social diving-for-food situation*
 G. Crepeaux, J.C. Olry, T. Henry, G. Rychen, R. Soulimani and **Henri Schroeder**
 Université de Lorraine, France
- S6.1 *Neurotoxic effects of proteasome inhibitor bortezomib in peripheral sensory neurons*
 J. Bruna, A. Alé, J. Jaramillo, X. Navarro and **Esther Udina**
 Universitat Autònoma de Barcelona, Spain
- S6.2 *Impact of moderate noise exposure on the kinetics of presbycusis*

- Pierre Campo**¹, T. Venet¹, C. Rumeau¹, A.Thomas¹, B. Rieger¹, C. Cour¹ and C. Parietti-Winkler²
¹Institut National de Recherche et de Sécurité (INRS), France
²E.N.T and Cervico-facial Department, Central University Hospital, France
²INSERM U954, Medical faculty, Nancy University, France
- S6.3 *Taurine depletion in drug-induced retinal toxicity and retinal diseases*
Serge Picaud
 Institut de la Vision, France
- S6.4 *Progression and reversibility of structural damage and functional deficits during chronic vestibular toxicity*
Jordi Llorens¹, C. Soler-Martín¹, P. Boadas-Vaello² and L. Sedó-Cabezón¹
¹Universitat de Barcelona, Hospitalet de Llobregat, Spain
²Universitat de Girona, Departament de Ciències Mèdiques, Spain
- StS2.1 *Neurospheres as a predictive 3D in vitro model for DNT testing and pathway investigation in a species-specific context*
Jenny Baumann¹, K. Gassmann¹, S. Giersiefer¹, J. Schuwald¹, M. Steinfath² and Ellen Fritsche¹
¹UF - Leibniz Research Institute for Environmental Medicine, Germany
²BfR-Federal Institute for Risk Assessment, Germany
- StS2.2 *Low concentrations of organophosphates induce acute and concentration-dependent effects on calcium homeostasis in PC12 cells*
Marieke Meijer and R.H. Westerink
 Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- StS2.3 *TOCP impairs glutamate signaling of central nervous system neurons*
Vanessa Hausherr, N.Schöbel and C. van Thriel
 IfADo - Leibniz Research Center for Working Environment and Human Factors, Germany
- S7.1 *Transcriptomics and metabolomics approaches to evaluate developmental neurotox*
Helena T. Hogberg¹, M. Bouhifd¹, G. Harris, A. Kleensang¹, S.J. Nolan¹, S. Odwin-DaCosta¹, D. Pamies, L. Smirnova¹, E. van Vliet², H. Welles¹, L. Zhao¹ and T. Hartung¹
¹The Johns Hopkins University, Bloomberg School of Public Health, USA
²University of Barcelona, Fetal and Perinatal Medicine Research Group, Spain
- S7.2 *Human stem-cell based micro-electrode array (MEA) platform for studying in vitro (developmental) neurotoxicity*
Susanna Narkilahti
 University of Tampere, Institute of Biomedical Technology (IBT) and BioMediTech, Finland
- S7.3 *miRNA expression profiling in human stem cells-based model as a tool for developmental neurotoxicity evaluation*
Anna K. Bal-Price
 Institute for Health and Consumer Protection (EC JRC), EU Reference Laboratory for Alternative Methods to Animal Testing (EURL-ECVAM), Italy
- S7.4 *A network formation assay for facilitated neurotoxicity testing*
Julia Sisnaiske¹, N. Schöbel¹, V. Hausherr¹, H. Hardelauf², S. Waide², P.Jacob², J.G. Hengstler¹, J. West², D. Janasek² and C. van Thriel¹
¹IfADo - Leibniz Research Center for Working Environment and Human Factors, Germany
²ISAS-Leibniz Institute for Analytical Sciences, Germany
- S7.5 *Effects of acrylamide and other neurotoxins on Ca²⁺ signals provoke by different neurotransmitters in NPCs derived from murine ESCs*
Christoph van Thriel and J. Sisnaiske
 IfADo - Leibniz Research Centre for Working Environment and Human Factors

- S8.1 *Evidence for non-acetylcholinesterase mechanisms in pesticide-induced developmental neurotoxicity*
Virginia (Ginger) C. Moser
U.S. Environmental Protection Agency, Toxicity Assessment Division, National Health and Environmental Effects Research Laboratory, USA
- S8.2 *Tubulin, microtubule associated proteins, and axonal transport as targets for organophosphorus pesticide*
W. Jiang, E. G. Duysen and **Oksana Lockridge**
University of Nebraska Medical Center, USA
- S8.3 *Disruption of endocannabinoid system function: A potential mechanism for pesticide-induced developmental neurotoxicity*
Russell L. Carr, A.L. Adams, D.R. Kepler, L.C. Mangum, C.A. Nail, M.K. Ross and A.B. Ward
Mississippi State University, Center for Environmental Health Sciences, College of Veterinary Medicine, USA
- S8.4 *Neuroendocrine and serotonergic modulation of chlorpyrifos induced long-term alterations in social behaviors*
A. Venerosi, **Gemma Calamandrei** and L. Ricceri
Istituto Superiore di Sanità, Department Cell Biology and Neuroscience, Italy
- S9.1 *Effects of prenatal environmental exposures on child health and development*
Frederica Perera
Mailman School of Public Health, USA; Columbia Center for Children's Environmental Health, USA
- S9.2 *Air pollution and neurodegeneration*
Miriam Gerlofs-Nijland
National Institute for Public Health and the Environment, The Netherlands
- S9.3 *Microglial mechanisms of air pollution-induced neurotoxicity*
Michelle L. Block
Virginia Commonwealth University Medical Campus, Department of Anatomy and Neurobiology, USA
- S9.4 *The acute hazard of inhaled volatile organic chemicals: understated or overblown?*
Philip J. Bushnell
Neurotoxicology and Teratology, USA
- S10.1 *Neuronal (network) function in developmental neurotoxicity testing*
Milou M.L. Dingemans, M.W.G.D.M. de Groot and R.H. Westerink
Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- S10.2 *Neuronal (network) function in developmental neurotoxicity testing*
Timothy J. Shafer
U.S. Environmental Protection Agency, USA
- S10.3 *In vivo behavioral and morphological screening of a 1078 chemical library using zebrafish*
Robert Tanguay, L. Truong and D. Haggard
Oregon State University, Department of Environmental and Molecular Toxicology, Environmental Health Sciences Center, Sinnhuber Aquatic Research Laboratory, USA

POSTERS (P)

- P1 *The CYP2E1 inhibitor, trans-1,2-dichloroethylene, reduces the systemic toxicity of allylnitrile and does not modify its vestibular toxicity: A mouse model for hair cell loss*
Pere Boadas-Vaello¹, S.Saldaña-Ruiz², L.Sedó-Cabezón² and J.Llorens²
¹Universitat de Girona, Departament de Ciències Mèdiques, Spain
²Universitat de Barcelona, Departament de Ciències Fisiològiques II, Hospitalet de Llobregat, Spain
- P2 *Sex-dimorphic behavioral and neuroendocrine effects of the organophosphate chlorpyrifos in a mouse model of autism spectrum disorders*
A. De Felice¹, M.L. Scattoni¹, S. Tait², L. Ricceri¹ and **Gemma Calamandrei**¹
¹Istituto Superiore di Sanità, Department of Cell Biology and Neuroscience
²Department of Food Safety and Veterinary Public Health, Italy
- P3 *Fetal exposure to MAM in rats induces life-lasting non-progressive neural impairment*
Didima de Groot¹, D. Fox², I. Waalkens¹ and J. Lammers¹
¹TNO, Zeist, The Netherlands; ²University of Houston, College of Optometry, USA
- P4 *Use of zebrafish larvae's swimming behavior to study brain development*
A. Beker van Woudenberg, A. Wolterbeek and **Didima de Groot**
TNO, Zeist, The Netherlands
- P5 *In vivo [¹⁸F]-FDG micropet imaging in developmental neurotoxicology: more information from fewer animals in a life cycle exposure study in rats treated with ethanol*
M. Bogaart¹, R. Nederlof¹, R.C. Slieker¹, C.F. Kuper¹, A. van Waarde², R.A.J.O. Dierckx², E.F.J. de Vries² and **Didima de Groot**¹
¹TNO, Zeist, The Netherlands; ²University Medical Center Groningen, The Netherlands
- P6 *Vulnerability of the rat brain to tributyltin oxide (TBTO) during developmental and juvenile exposure windows*
Didima de Groot¹, M. Radonjic¹, R. Nederlof¹, M. Bogaart¹, M. Berk^{1,2}, J. de Groot¹, C. de Esch¹, C. F. Kuper¹, A. Wolterbeek¹, A. Veltien², A. Heerschap², R.A.J.O. Dierckx³, A. van Waarde³ and E.J.F. de Vries³
¹TNO, Zeist, The Netherlands
²Radboud University Medical Centre Nijmegen, The Netherlands
³University Medical Centre Groningen, The Netherlands
- P7 *Chemically induced aging of PC12 cells to study in vitro neurodegeneration*
Martje W.G.D.M. de Groot and R.H. Westerink
Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- P8 *In vitro neurotoxic hazard characterization of brominated and halogen-free flame retardants*
Hester S. Hendriks and R.H. Westerink
Utrecht University, Institute for Risk Assessment Sciences, The Netherlands
- P9 *The neurosphere assay for environmental neurotoxicants*
Masami Ishido
National Institute for Environmental Studies, Center for Environmental Risk Research, Japan
- P10 *Mechanistic insights into the influence of histone hyperacetylation in regulating mesencephalic dopaminergic neuronal survival: implications for PD pathogenesis*
Arthi Kanthasamy
Iowa State University, Department of Biomedical Sciences, Iowa Center for Advanced Neurotoxicology, USA
- P11 *An in vitro method for neurotoxicity using neuronal cells derived from mouse embryonic stem cells*
Kumiko Kobayashi, N. Suzuki, A. Kuwahara, S. Ando and K. Saito
Sumitomo Chemical Co., Ltd., Environmental Health Science Laboratory, Japan

- P12 *Developmental neurotoxicity assessment of mixtures in children*
Pim E.G. Leonards¹ and M. Dingemans²
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- P13 *Molecular field topology analysis of structural determinants for acute and delayed neurotoxicity of organophosphorus compounds*
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- P14 *Low concentrations of organophosphates induce acute and concentration-dependent effect on calcium homeostasis in PC12 cells*
Marieke Meijer and R.H. Westerink
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- P15 *The lactational exposure to Σ6 NDL-PCBs induces P53-dependant responses to cellular stress and a decrease of protein levels involved in the generation, the conduction and the transmission of the electrical signal on neurons*
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- P16 *Immunohistochemical localization of neuron specific enolase and (CD3) lymphocyte activation*
Olalekan M. Ogundele¹, J. Madukwe², O.A. Omotosho¹, O. Adeeyo¹, C.O. Akintayo¹ and E.A. Caxton-Martins³
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- P17 *Microtubule polymerization properties of vitamin D₃ (1,25-dihydroxycholecalciferol) in fish scale melanocytes: a model for the study of vitamin D₃ in MTPT induced parkinsonism*
Olalekan M. Ogundele
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- P18 *Perinatal methylmercury exposure perturbs the expression of myelination genes in developing rat brain*
Bhaja K. Padhi and G. Pelletier
Health Canada, Hazard Identification Division, Environmental Health Science and Research Bureau, HECSB, Canada
- P19 *Changes in miRNA expression profiling in human stem cells-derived neuronal culture after exposure to methyl mercury*
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- P20 *Chronic oral exposure to low doses of clorpyrifos differentially affects physical and behavioral endpoints in ApoE2, ApoE3 and ApoE4 transgenic mice*
Fiona Peris^{1,2}, I. Reverte^{1,2}, M. Cabre¹, J.L. Domingo¹, F. Sanchez-Santed³ and M.T. Colomina^{1,2}
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- P21 *Comparative effects of parathion and chlorpyrifos on extracellular endocannabinoids: influence on cholinergic toxicity*
Carey N. Pope¹, L. Parsons² and J. Liu¹
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- P22 *Dose- and time-related effects of diisopropylfluorophosphate (DFP) on depressive-like behaviors in rats*
 J. Liu and **Carey N. Pope**
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- P23 *Postnatal exposure to BDE-209 differently affects learning and memory in 4 and 12 months old mice carrying ApoE2, ApoE3 or ApoE4 alleles*
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- P24 *Behavioral flexibility, dopamina, GABA and glutamate systems are targeted by chlorpyrifos exposure: long term effects*
Fernando Sánchez-Santed¹, L. Montesdoca¹, A.M. Ruiz-Muñoz¹, F. Nieto-Escámez¹, M.T. Colomina², C. Suñol³, M. Moreno¹ and P. Flores¹
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- P25 *Effects of a gestational and lactational exposure to a 16 PAH mixture on regional brain activities of cytochrome oxidase and acetylcholinesterase of rat pups*
 G. Crepeaux, P. Kremarik-Bouillaud, N. Sikhayeva, G. Rychen, R. Soulimani and
Henri Schroeder
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- P26 *Short- and long-term behavioral toxicity of a gestational and/or lactational exposure of rat pups to a mixture of 16 polycyclic aromatic hydrocarbons (PAHs)*
 G. Crepeaux, P. Bouillaud, J. Olry, C. Feidt, G. Rychen, R. Soulimani and
Henri Schroeder
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- P27 *Rotenone induced mitochondrial dysfunctions in prepubertal mouse brain regions and dopaminergic neurons (N27 cell lines): amelioration by standardized Bacopa monnieri extract*
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- P28 *miRNA expression profiling and 3D neuronal differentiation of luminescent progenitor cells as an in vitro model for DNT assessment*
Lena Smirnova, G. Harris, H. Hogberg, S. Martos, T. Dao and T. Hartung
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- P29 *Effects of perinatal exposure to contaminated eels with PCBs on neuropsychological states including anxiety and mood, at progressive life stages in mice: a preliminary study*

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- P30 *Developmental toxicity of methylmercury can be associated with actin-binding protein cofilin dephosphorylation and translocation to mitochondria in cerebellar granule cells*
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- P31 *Esterases interacting with organophosphorus compounds different to cholinesterases and neuropathy target esterase in nerve tissues*
J. Estevez, I. Mangas, M.A. Sogorb, M. Benavent and **Eugenio Vilanova**
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- P32 *Short new in vitro developmental toxicity assays on embryonic stem cells based on gene biomarker of differentiation. Example of application to the neurotoxicant chlorpyrifos*
M.A. Sogorb, A.C. Romero, D. Pamies, C. Estevan and **Eugenio Vilanova**
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- P33 *Repeated maternal-separation and ultrasonic vocalization of rat pups*
Hiromi Wada
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- P34 *Disturbance of human neuroectoderm formation by toxicants is associated with altered chromatin marks*
Tanja Waldmann, N.V. Balmer, M.K. Weng, B. Zimmer and M. Leist
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- P35 *Zebrafish embryo and larva: alternative model to study locomotor behavior and predict neurotoxic potential of chemicals and drugs*
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- P36 *Differential performance of Wistar Han and Sprague Dawley rats in behavioral tests*
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