



Newsletter Spring 2021

International Neurotoxicology Association



Message from the President

Dear INA members,

I hope that this newsletter finds you and your loved ones in good health. It is hard to believe that it has been almost a year since the emergence of COVID and that we all have had to find new ways to live and work. It has had a tremendous impact on many of us in terms of how we do science, with laboratories being shut down for periods of time and in some cases limited in capacity until this pandemic is over. Hopefully, everyone has found a way to move forward with their lives and work and soon vaccines will enable us to return to some sense of pre-pandemic normalcy; I know it might be some time before I'm ready to sit in a crowded movie theater!

There is a lot to cover in this newsletter. First, we had an election this spring and I have the pleasure of congratulating our newly elected officers. Aaron Bowman is our President Elect, and Jason Cannon is a newly elected Councilor while Helena Hogberg was re-elected as councilor. Congratulations to all of you and my sincere thanks to candidates Ellen Fritsche, Qiao Niu and Roberto Lucchini for their willingness to run as candidates. I also want to thank Roberto Lucchini for his service as councilor over the last few years.

The other big news concerns the **INA-18** meeting. It had been scheduled for this spring, and was postponed until the fall of 2021. The INA officers and meeting planning committee met late last fall and decided to postpone the meeting again until the **Spring of 2022**. The meeting will remain in Durham, NC. This decision was made primarily due to a strong desire to have an "in person" rather than "virtual" meeting, but to do so under conditions in which the health and safety of our members is assured. While the virus numbers appear to be improving and vaccines are becoming more widely available, the consensus was that postponing the meeting until the spring of 2022 would give us the best chance of having the type of meeting that allows INA members a venue to share their outstanding science and network with their peers. Stay tuned in the coming months as the scientific committee will be ramping up its planning efforts.

Best wishes to all of you

Tim Shafer,
President (2019-2021) International Neurotoxicology Association

Current INA Officers

President	Tim Shafer	timshafer.INA@gmail.com
President-Elect	Pam Lein	pjlein@ucdavis.edu
Past-President	Remco Westerink	r.westerink@uu.nl
Secretary	Mamta Behl	mamta.behl@nih.gov
Treasurer	Harm Heusinkveld	treasurerinternationalneurotox@gmail.com
Councilor	Roberto Lucchini	roberto.lucchini@unibs.it
Councilor & Website editor	Helena Hogberg	hhogber2@jhu.edu

Congratulations to Newly Elected Officers (2021-2023 terms)

Aaron Bowman	President-Elect
Jason Cannon	Councilor
Helena Hogberg	Councilor (re-elected)

A short message from the Treasurer's office

Dear colleagues,

A short message from the Treasurer's office. I hope you are all doing well and managing to stay healthy. Last year I sent out the invoices for membership dues for the 20-21 membership period. However, the vast majority were returned to sender as undeliverable due to overflowing inboxes and consequently, only a few people responded with a payment. Early this year I sent a new round of invoices and this time the invoice apparently made it to most inboxes. So, please check your inbox or spam folder for a message from your treasurer and make me happy!

INA's **very low dues** (€50 or \$60 for two years) come with many **benefits**: a discounted rate for attending our biannual INA meetings, access to a network of the world's best neurotoxicologists, the possibility to win the annual INA-NeuroToxicology Best Paper Award, and the best group of colleagues that anyone could ask for!

The PayPal invoice can of course be paid via a personal PayPal account, but also via other routes including credit cards and bank accounts.

Remember that if things are unclear or you have difficulty paying your dues through this system you can always contact me at: treasurerinternationalneurotox@gmail.com.



Not a member? Fill out an application form at <http://www.neurotoxicology.org/membership/>

Student membership is FREE!

With financial greetings,

Harm Heusinkveld, Treasurer

2021 INA Business Meeting

INA typically holds a business meeting at the SOT meeting. With SOT being virtual this spring, I have decided that we will hold a virtual business meeting on **March 22, 2021 from 10am – noon, Eastern Daylight Time**. Please be on the lookout for a meeting invite from Mamta Behl coming to your in box soon!

If you can't make it to the meeting, minutes are posted to the INA website (<https://www.neurotoxicology.org/ina-business-meetings>).

INA - NeuroToxicology Best Paper award

Dear INA-members,

The Elsevier journal *NeuroToxicology* is the affiliate journal of INA. In recognition of this affiliation, Elsevier generously provides funds to support an annual *INA-NeuroToxicology best paper award!* We are soliciting nominations from INA members who published papers in *NeuroToxicology* (Elsevier) during the 2020 calendar year.

To nominate a paper for consideration, please send the following information to the Editor-in-Chiefs, Pamela Lein (pjlein@ucdavis.edu) and/or Remco Westerink (r.westerink@uu.nl):

- (1) Complete citation of the paper being nominated, including all author names;
- (2) Identification of author(s) who are INA member(s) in good standing;
- (3) Justification for considering the nominated paper for this award.

The deadline for nominations is June 15, 2021.

INA-17 Highlight- David Ray Award

Kelley Patten (University of California, Davis) was selected to the David Ray award at INA 17. She has taken the time to write a brief summary of her research in case you missed her presentation.

My research focuses on how chronic exposure to traffic-related air pollution (TRAP) influences Alzheimer's disease (AD) progression in rats. Multiple epidemiological studies have found an association between TRAP exposure and AD or dementia, but confirming this in animal models has been challenging for several reasons: First, real-world vehicular air pollution is difficult to replicate due to its compositional complexity and temporal fluctuations. Second, life-long air pollution exposures are difficult and costly to perform in rodent models. In our study, we attempted to address these challenges by collaborating with engineers Tony Wexler and Keith Bein (UC Davis) to build a vivarium next to a freeway tunnel. The tunnel naturally concentrates vehicular air pollution and delivers it directly to

rodents housed in the vivarium, while an extensive filtering system creates an on-site filtered air control exposure. The TRAP particulate matter exposure levels within the vivarium were within regulatory limits, suggesting that these exposures were similar to those experienced by humans. Since there are data suggesting that TRAP can influence AD directly, as well as in a gene-by-environment fashion, we included both Alzheimer's transgenic and wildtype (WT) rats in our study. We also included male and female animals, since AD has a strong female sex bias. Animals were exposed to TRAP for up to 14 months, with additional timepoints after 2, 5, and 9 months.

One of the main findings from this research was that TRAP exposure both accelerated and exacerbated AD phenotypes. After only 2 months of TRAP exposure, we found that transgenic female rats had pathological amyloid-beta plaques in their brains, before plaque deposition in any other group. Both WT and transgenic TRAP-exposed animals also had worse cognitive performance, increased neuronal cell loss, and increased hyperphosphorylated tau compared to filtered air controls. The second striking finding of this research was that TRAP had dramatically different effects on neuroinflammation in male and female animals, depending on their age. In young animals, TRAP increased microglial activation in both sexes, but in older female animals, TRAP had an opposite effect and decreased microglial activation. Male TRAP-exposed animals showed increased microglial activation independent of age. Collectively, our data show that TRAP can enhance AD phenotypes and alter neuroinflammation even at low mass concentrations, and that the effects of TRAP on AD are strongly influenced by sex and age.

I was drawn to this project for its public health relevance and for its novel approach. While I have always been fundamentally interested in understanding how environmental stimuli can perturb basal biology, my training prior to my PhD was predominantly in basic molecular biology. I find toxicology research particularly compelling because it occupies such a unique niche between basic science and epidemiology. For diseases with long pre-symptomatic stages such as AD, I believe a deeper understanding of how lifelong environmental exposures can alter typical disease pathogenesis will be crucial in achieving better patient outcomes and personalized therapies. I hope to contribute to the development of better therapeutics in my new position as a Discovery Safety Scientist at AstraZeneca in Sweden!



Figure 1. Remco Westerink with David Ray Award winner Kelly Patten, from the University of California, Davis

INA-18, Durham, NC in 2022

INA-18 will be held in Durham, North Carolina, USA; The Executive committee recently decided to move the dates of the meeting to the Spring of 2022 due to concerns regarding the corona virus. The theme of the meeting will be **“Integration from high throughput screens to complex organisms to protect humans from neurotoxicity.”** Building on the INA meetings of the last decade in Israel (2009), China (2011), The Netherlands (2013), Canada (2015), Brazil (2017) and Germany (2019) INA will meet in Durham, North Carolina, USA in 2022.

Durham is adjacent to the Research Triangle Park (RTP) Area, home to the National Institute of Environmental Health Sciences (NIEHS) and the US Environmental Protection Agency (US-EPA), as well as several major research universities, including Duke University, the University of North Carolina, North Carolina State University and North Carolina Central University, Bayer Inc. and the Research Triangle Institute. The RTP area includes one of the greatest concentrations of neurotoxicologists anywhere in the world. This provides a great opportunity for INA for participation of a great range of neurotoxicology scientists and students. Durham is a culturally rich city in the RTP region with excellent restaurants, microbreweries, music and sports. The local organizing committee is taking advantage of this to plan some unique networking events for the meeting.

Possibilities for symposia include:

- ✓ *Neurotoxicology for Second Quarter of the 21st Century*
- ✓ *Advancements in Bioinformatic Methods to Winnow Critical Mechanistic Understanding from the Sea of High Throughput Data*
- ✓ *Addressing Psychiatric Problems Resulting from Neurotoxic Exposures,*
- ✓ *Mitochondrial Mechanisms of Neurotoxicity*
- ✓ *Neurotoxicity, Using Zebrafish Models to Link Molecular and Cellular Neurotoxic Mechanisms with Behavioral Dysfunction*
- ✓ *Epigenetic Modification as a Transgenerational Mechanism in Neurotoxicity*
- ✓ *Microbiome interactions with Neurotoxic Mechanisms*
- ✓ *Advancing Neurotoxic Risk Assessment Toward a Sustainable Future*
- ✓ *Neurotoxic consequences of COVID-19*
- ✓ *Emerging technologies for neurotoxicology research*

Proposed Schedule:

- ✓ Monday: Welcoming Reception, Hooisma Lecture (INA)
- ✓ Tuesday: Symposia and Platform Sessions
- ✓ Wednesday: AM Scientific Meetings, PM social and cultural activities
- ✓ Thursday: Symposia, Business meeting, Poster session
- ✓ Friday morning: Symposia and platform sessions

Look for a call for proposals soon from the Scientific Organizing Committee. Submission deadline will be September 1st, 2021.

Local Organizing Committee

Edward D. Levin, PhD, Duke University, Durham, NC, USA

Timothy Shafer, PhD, U.S. Environmental Protection Agency, Research Triangle Park, NC, USA

William Boyes, PhD, U.S. Environmental Protection Agency, Research Triangle Park, NC, USA

G. Jean Harry, PhD, National Institute for Environmental Health Sciences (NIEHS), Research Triangle Park, NC, USA

Mamta Behl, PhD, NIEHS, Research Triangle Park, NC, USA

Chris McPherson, NIEHS, Research Triangle Park, NC, USA

Scientific Organizing Committee

Pamela Lein University of California, Davis, Davis, CA, USA

Ed Levin Duke University, Durham, NC, USA

Christoph Van Thriel Leibniz Research Centre for Working Environment and Human Factors (IfADo). Dortmund, Germany.

Anna Price European Commission Joint Research Centre, Ispra, Italy

Anke Tukker Purdue University, West Lafayette, IN, USA

Meeting Facilities

The Durham Convention Center provides first-rate meeting space and fully equipped convention facilities. This Marriott Hotel is directly connected with the Convention Center. Three other hotels, the C21 Museum Hotel, the Durham Hotel and the Unscripted Hotel are within one city block of the Convention Center. The hotel rooms are approximately US\$195 per night for either a single or a double room. It is proposed that we will have the traditional all-inclusive rate including meeting registration, rooms and meals. In addition, because of the large local group of neurotoxicologists there will also be available meeting-only rates.

Travel

Raleigh-Durham (RDU) International Airport is 10 km west of downtown Durham with convenient flights to a wide variety of cities across the globe. RDU has direct flights to many cities in North America, including New York, Toronto, Atlanta, Dallas, Los Angeles, San Francisco and Seattle as well as direct flights to Europe, including London and Paris.

Social and Networking Events

We are planning an evening for post-docs and students to network, as well as the traditional INA social event. Thanks to the precedent set by INA-17, this event will add weapons to the traditional evening of education, food and fun. We are thinking that axe throwing will be a great way for INA members to network. Stay tuned for more details on both of these events!

Call for special issue proposals - NeuroToxicology

INA is affiliated with the journal *NeuroToxicology*, and any INA member is welcome to organize a Special Issue for this journal. Special Issues can be focused on:

- A specific topic of broad interest to the field of neurotoxicology,
- 'Integrated neurotoxicology' like neuro-immune, neuro-endocrine and other topics that integrates multiple organ systems including the CNS/PNS, or on
- Convergent mechanisms of neurotoxicity, like neuroinflammation, oxidative stress, brain-gut axis, peripheral nervous system, etc.

For details on *NeuroToxicology* see <http://www.journals.elsevier.com/neurotoxicology>.

For specific questions or sending your proposal for a Special Issues, please contact Pam Lein (pjlein@ucdavis.edu) or Remco Westerink (r.westerink@uu.nl).

Call for High Quality Images for *NeuroToxicology* Covers

INA is affiliated with the journal *NeuroToxicology*, and The Editors-in-Chief of the journal *NeuroToxicology* are soliciting high-quality images from your research in neurotoxicology to feature as the cover image on the journal's bimonthly issues. The Elsevier Senior Publisher for Elsevier's Toxicology portfolio, Jagna Mirska-Gent, has agreed to provide open promotional access for one article accepted for publication in *NeuroToxicology* to individuals whose image is chosen to be featured as a cover image. Open promotional access (which means the article is freely available without paying OpenAccess fees, but unlike OpenAccess the publisher retains the copyright) can be used for an article unrelated to the image chosen for the cover image and images submitted for consideration do not need to be associated with an article submitted to the journal.

Please submit high quality images along with a brief description of the image (including identification of the individual(s) who generated the image) to the Editors-in-Chief, Pamela Lein (pjlein@ucdavis.edu) and Dr. Remco Westerink (r.westerink@uu.nl) along with assurance that there are no copyright issues associated with *NeuroToxicology* using the image. If you have any questions, please contact either Dr. Lein or Dr. Westerink.

Job Postings

Colleagues,

One challenge during COVID, especially for our student and post-doctoral members, has been the ability to network and hear about available position openings. If you have a position opening in your lab or department, please be sure to forward that announcement to Mamta Behl and Helena Hogberg. They will make sure that the announcement is circulated to our membership and posted on the website.

News from our members

Do you have some news to share? Let us know at timshafer.ina@gmail.com !

Just for Fun

Congrats to Will Boyes, who won the last “Just for Fun” and received a handmade pen.

Life via Zoom: Just like everyone else, INA has been doing business via Zoom. Below is a screenshot from a meeting where we were discussing INA 18.

So, for a *fabulous* prize, put thought/speech bubbles above at least 2 of the participants in this call. More points for each person that you include. Entries will be due to timjshafer.ina@gmail.com by March 20. Best entry will receive a great prize and will be announced at the business meeting on March 22nd. Must be safe for work!

