



Newsletter Autumn 2018

International Neurotoxicology Association



Message from the President

Dear INA members,

It has been a warm and sunny summer for most of us. Hopefully you had some time to relax in between finishing grant proposals and manuscripts! With some luck, you also managed to free some time for writing a session proposal for the 17th INA meeting, to be held in Dusseldorf 2019.

You will read more about the meeting in this newsletter. While still far away, we are already preparing for our INA-18 meeting in 2021 to be held in Durham, USA. More information will follow in due time!

Earlier this year, we also had our annual INA business meeting at the 57th SOT meeting in sunny San Antonio. As you can read from the minutes, INA is still going strong with over 100 active full members that paid their dues.

At the SOT meeting, also the first INA-NeuroToxicology best paper award was announced; remember you can apply again next year for this exclusive INA award if you published in 2017 in NeuroToxicology.

Unfortunately, the summer also brought very sad news: Phil Bushnell passed away much too early on July 30. Phil has been an active and long-term INA member. He has been treasurer of INA and he was involved in many of our earlier meetings. Many of us will remember his scientific contributions as well as his warm personality and friendship.

Phil will be missed greatly.

Remco Westerink,
President (2017-2019) International Neurotoxicology Association

Current INA Officers

President	Remco Westerink	r.westerink@uu.nl
President-Elect	Tim Shafer	TimShafer.INA@gmail.com
Past-President	Ed Levin	edlevin@duke.edu
Secretary	Sandra Allen	sandra.allen@regulatoryscience.com
Treasurer	Harm Heusinkveld	H.J.Heusinkveld@uu.nl
Councilor	Roberto Lucchini	roberto.lucchini@unibs.it
Councilor & Website editor	Helena Hogberg	hhogber2@jhu.edu

Philip J. Bushnell, Ph.D. (1947-2018)

It is with great sadness we report that Dr. Philip J. Bushnell passed away peacefully at home on Monday, July 30, 2018, after a brief but difficult battle with cancer. He was a world-renowned expert in behavioral neurotoxicology and served as Editor-in-Chief of *Neurotoxicology and Teratology* from 2011 to 2017. Philip J. Bushnell was born in Honolulu Hawaii in 1947. He graduated from the University of California Santa Cruz with a degree in Chemistry. He went on to graduate school at the University of Wisconsin Madison where he earned Masters and PhD degrees in Psychology, and did postdoctoral training in Biochemistry. At Wisconsin, Phil primarily studied the effects of developmental exposure to lead on the behavioral function of primates and rats, investigating mechanisms for those persisting effects. From 1981 - 1985, Phil was a research scientist and Assistant Professor at the Institute of Environmental Medicine at the New York University Medical Center.

In 1985, Dr. Bushnell was recruited to the US Environmental Protection Agency (EPA) Neurotoxicology Division in Research Triangle Park, NC. His broad research interests included the neurobiology of cognitive processes (attention, learning, and memory); the effects of neurotoxic chemicals (solvents, pesticides and bio-accumulative toxicants) on cognition in man and in experimental animals; neurochemical and neurophysiological substrates of behavior; physiologically-based pharmacokinetic and neural network modeling. Phil established a state of the art laboratory for studying the effects of exposure to environmentally relevant chemicals on operant performance. His lab developed a capability to conduct operant training and performance sessions while the subjects were concurrently exposed by inhalation to volatile organic compounds. Phil, working with a collaborative team, developed relationships between external exposure to volatile organic compounds, which were listed as hazardous air pollutants under the Clean Air Act, internal concentrations of the compounds in the blood and brain, and changes in behavioral performance. Those relationships enabled comparisons of the potency of different substances, extrapolation across a range of exposure conditions (concentration and duration of exposure), and predictions of effects in humans from data collected in laboratory animals. These models also led to a strategy to estimate financial burden of impaired cognitive performance from air pollution exposure.

With the growing concern for environmental consequences of reliance on petrochemical fuels and the passing of renewable fuel standards, it became essential for EPA to understand if there were risks associated with increased use of bioethanol in automotive gasoline. Accordingly, Phil led a large collaborative project to study the potential harm to the developing nervous system that may result from breathing gasoline/ethanol vapor blends. Phil was the central figure in organizing this complex multi-investigator project. Among the multiple technical and logistical challenges was obtaining a large quantity of condensed vapors of ethanol-gasoline mixtures, which were distilled especially for the project at a petrochemical plant in Richmond California. One critical consideration for the project was to keep the gasoline/ethanol vapor concentrations below the lower explosive limits so that we did not blow the roof from the RTP EPA laboratories! Eventually, the multiple exposures and follow-up experiments were successfully accomplished. Fortunately, for anyone who uses automobiles and breathes air, no substantial risks of developmental exposure to ethanol-gasoline vapor mixtures were identified. This project was central in EPA's progress to develop and register biofuels as renewable fuel sources.

Phil's final project before retirement used *Drosophila* to determine gene-environment interactions in neurotoxicology. He took his vast expertise in behavioral neurotoxicology of warm blooded species and turned that insight to the study of fruit flies. Phil served on many national and international committees and workgroups over his career, publishing over 100 peer-reviewed scientific articles, including several key state-of-the science reviews. Among the notable publications, approximately bookending his career, were a 1977 report in *Science* that exposure to lead caused scotopic visual deficits in young monkeys, and a 2013 report in the *American Scientist* on the risks of inhaled organic solvents. A common theme throughout Phil's science was the continued emphasis on the need for cognitive assessments in neurotoxicology.

Phil retired in 2015 after more than 30 years of service to EPA. He was a valued and beloved colleague of many at EPA and the broader toxicology communities. Phil was an accomplished musician and a member of the Triangle Jazz Club and the Village Band of Chapel Hill and Carrboro. He was also an avid hiker and birdwatcher. He loved being outdoors and was seldom caught without his binoculars. If this wasn't enough, Phil was active in blazing trails for the local Triangle Land Conservancy and making exquisite wood furnishings and tableware in his shop, as well as bird feeders and houses for his feathered friends. We remember Phil as an insightful and careful scientist and as a wonderful human being. A quick wit, a warm smile, and a caring spirit, we will miss him greatly.

Respectfully submitted,

William K. Boyes, Mary E. Gilbert, Andrew Geller, David Herr and Ed Levin



Phil and Sharon Bushnell

A short message from the Treasurer's office

Dear colleagues,

With the start of the year 2018, a new membership period has started (2018-2019). Starting this membership period, I started sending invoices via PayPal. Many of you responded with a payment, many thanks for that! We are approaching the 60 paying members now.

Since this is quite a difference with last period (105 paying members), I wonder where all those members went. The first reminder has been sent already quite a while ago, so I will send another in due time. Please check your email box for any sign of an email from your treasurer asking you to pay your dues...

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 do not manage to pay your dues through this system you can always contact me at: treasurerinternationalneurotox@gmail.com.



With financial greetings,

Harm Heusinkveld, Treasurer

Minutes INA business meeting – SOT (San Antonio, 2018)

Participants: Tomas Guilarte, Christoph Van Thriel, Will Boyes, Lucio Costa, Evelyn Castiglioni, Carey Pope, Jean Harry, Fang Liu, Ellen Fritsche, Ed Levin, Remco Westerink, Harm Heusinkveld, Tim Shafer (via telephone), Helena Hogberg (via telephone).

- Welcome
- Approval of minutes from INA Business Meeting (Florianopolis, May 2017)
- Minutes are approved by the participants

1) President's report - *Remco Westerink*

2017 was a good INA year, with a successful INA16 meeting in Florianopolis. There will be a INA-16 special issue in NeuroToxicology, which is progressing fine: 26 submissions, currently 6 accepted, 5 rejected; ~18 expected MS in the final version.

INA17 meeting preparations already in progress, and the recent affiliation of INA-NeuroToxicology will be of considerable financial help. Following several rounds of negotiations, the sponsorship now includes financial support for the conference as well as award money for poster prizes, travel funds and the Hooisma lecture. The INA-NeuroToxicology affiliation can also be seen on the website of the journal and INA.

In 2017, it was also agreed to attempt to update the membership list: Following about 500 e-mails in 2017, we have now a good view on our membership, and the list can be cleaned, i.e. remove everyone who has not been paying dues or responding to communication for the last 5 years.

2) Secretary's report - *Remco Westerink on behalf of Sandra Allen*

Membership status and acceptance of new members, current number of members: 108 full members and 10 student members, from 20 countries in all continents except Antarctica.

3) Treasurer's Report - *Harm Heusinkveld*

INA is doing fine financially. Although money is spent on e.g. the INA meeting, INA's savings have increased over the last 5 years thanks to a number of things.

Firstly, the number of paying members is gradually increasing: Last dues period 105 members paid their dues, which is a record. Secondly, the last years a number of companies paid for being listed on the INA website, money that is earmarked as student support fund: INA was able to pay two student awards from this fund during last meeting.

Last but absolutely not least, INA is being sponsored by Elsevier annually as of 2017. This money is earmarked for the INA meeting and includes money for the Hooisma lecture and INA awards.

To ease dues payment for our members, INA members will receive a PayPal invoice for the 2018-2019 period. This approach has been tested with the INA board members and works very well.

4) Web site update - *Helena Hogberg*

The website is up-to-date. If something needs to be changed or someone has a better idea for the website Helena asks for someone to take over.

5) Report of INA-16 meeting by the INA-16 Local Organizing Committee - *Ed Levin*

Successful meeting in Florianapolis (Brazil). Financially speaking the meeting ends positively; the organizing committee still awaits one grant, depending on this grant the balance will be slightly or very positive.

6) Update status of the INA-17 meeting by the Local Organizing Committee - *Christoph van Thriel*

INA-17 will be organized in Düsseldorf in September 29 – October 3, 2019. Registration will include a full package and is estimated to cost 650 euro, rooms will cost around 90-140 euro per night. A call for proposals is out. The meeting will start on Sunday has no parallel sessions, has student sessions, poster sessions in the evening and the Social Event will be a visit to the Neanderthal. The Hooisma lecture will be given by Deborah Cory-Slechta.

7) Proposals for INA-18 in 2021

The board received only one proposal for INA-18 in May/June 2021 from Durham. The topic is suggested to be "Tox 21". A question is asked whether INA-18 should be a joined meeting with the NTS again. Jean agrees to discuss this with the next president of the NTS. The proposers are asked to consider organizing the meeting in the autumn (September) instead of May/June. This will be considered.

8) Next INA board member election - *Ed Levin*

Ed will start the procedure for the INA board member election and proposes to elect council members for 4 years alternating every 2 years. This will ensure a continuity. The participants agree that this is a good idea. Ed will check the by-laws to make sure this is already possible or that by-laws need to be changed.

9) Any other business?

No other business is brought to the table.

10) Close the meeting

Meeting is closed by Remco Westerink

INA - NeuroToxicology Best Paper award

Dear INA-members,

We recently launched the *INA-NeuroToxicology best paper award*, sponsored by NeuroToxicology (Elsevier). This award is exclusively for INA members that published in NeuroToxicology (Elsevier).

The winner of the award was announced at the NTSS-reception at SOT2018 in San Antonio. There were several really good nominations for 2017, but of course there can be only one winner...

The winner of the *INA-NeuroToxicology best paper award 2017* is **Anumantha Kanthasamy** (Sarkar et al., (2018). Manganese exposure induces neuroinflammation by impairing mitochondrial dynamics in astrocytes. NeuroToxicology, 64: 204-218).

Anumantha generously donated the award money (250USD) to the Toshio Narahashi Endowment fund. Congratulations and many thanks for your donation Anu!

Postgraduate course on Neurotoxicology

Dear colleagues,

We are happy to announce that the Postgraduate Education in Toxicology (PET; the Dutch national programme for vocational postgraduate training in toxicology) will be offering a new course on Neurotoxicology starting in March 2019.

The course consists of lectures, webinars and (active) classes from international experts during which various examples of neurotoxicants and their effects will be discussed. Topics include basics of neurotoxicology, cellular and molecular mechanisms of neurotoxicology, neurobehavioral toxicology, DNT, neuropathology, human health effects of specific neurotoxicants (metals, solvents, drugs, pesticides), regulatory neurotoxicity testing, alternative models as well as the contribution of neurotoxic compounds to complex neurodevelopmental disorders and neurodegenerative diseases.

Duration of the course is one week with two days distant learning and three days of physical attendance at Utrecht University, Utrecht, The Netherlands. The course is open for professionals in the private and public sector and for PhD students that want to broaden their knowledge in neurotoxicology.

For more information and course registration please visit www.toxcourses.nl or contact us (r.westerink@uu.nl; a.m.tukker@uu.nl).

We look forward to welcome you in the course,
Remco Westerink and Anke Tukker

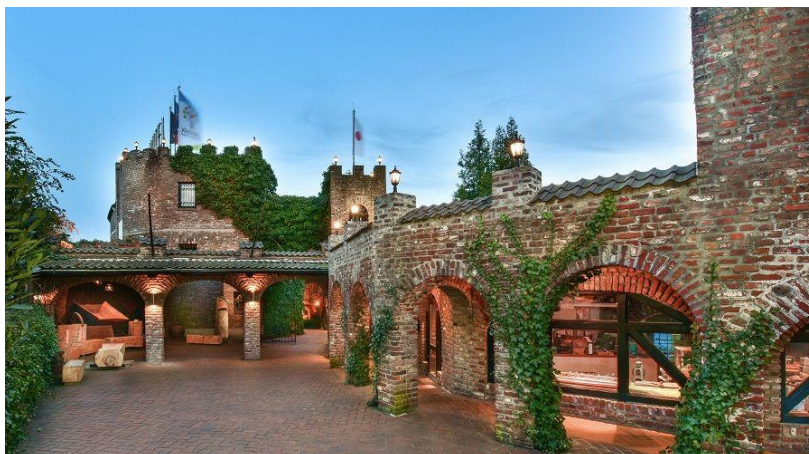
INA-17, Düsseldorf, Germany in 2019

As announced in the previous newsletters and on the INA website our next biannual meeting will take place in Düsseldorf, Germany, from September 29th until October 3rd. During the call for symposia proposals we received scientifically excellent proposals from the INA membership and nine will provide the backbone of the scientific program. They cover a broad range of topics and several young scientists are involved. The following titles are given to illustrate the rich scientific program that you can expect so far when attending INA-17:

- 1) Immune dysregulation as a primary mechanism of early neurotoxicity – relevance to disease
- 2) Bridging Across Levels of Analysis to Advance Neurotoxic Risk Determination: Toxicology for the Second Fifth of the 21st Century
- 3) Next generation in vitro neurotoxicity testing: human induced pluripotent stem cell derived neuronal models
- 4) *In vitro* and other alternative methods for improving the regulatory assessment of developmental neurotoxicity
- 5) Integrating human and animal studies to develop mechanistically based biomarkers of neurotoxicity: A case study of occupational chlorpyrifos exposure
- 6) Exposure paradigms for psychoactive substances; duration and times of *in vitro* and *in vivo* neurotoxicity testing
- 7) Compounds' modes-of-action (MoA) causing developmental neurotoxicity (DNT) can be used for informing adverse outcome pathways (AOPs)
- 8) Systems neurotoxicology: From *in vivo* towards predictive *in vitro* models
- 9) Use of imaging data for risk assessment: Updates, challenges and future perspectives

However, you can still contribute to the scientific program by submitting your abstract for an oral or poster presentation. The call for abstracts will be announced by email during December 2018 and submissions will be possible until June 30th, 2019. The corresponding authors will be informed about the acceptance approximately 2-4 weeks after submitting an abstract. The decision about oral or poster presentation will be made shortly after the deadline (July 15th-31st 2019).

Next to the opening Hooisma lecture (by Prof. Deborah A. Cory-Slechta), INA-17 will have the traditional David Ray Student Symposium that provides a platform for PhD student supervised by an INA member. All student members are invited and all INA members supervising students are called to convince their students to go to INA-17!



The congress venue and the available rooms can be viewed on the website (<https://guthoehne.de/en/>) and we were able to negotiate special rates. Single rooms are available at a rate of 99€/night (with direct access to the pool: 110€/high), double rooms are available as comfort (145€/night) and superior version (160€/night). Some double rooms are also available next to the pool (175€). The hotel provides several wellness offers (e.g. sauna, pool, massages, etc.) as well as free WiFi access. Booking will be possible next year.

The registration fee will include the get-together, meals, coffee breaks with food as well as the social program (conference dinner), but at the moment we cannot give a solid estimate. We expect to be in the range of 700€ but the calculation depends on the number of participants and funding that we can get from various sources. Discount for student will be offered anyhow. We'll keep you informed via INA mailings, newsletters and the INA-17 website, which will be launched together with the call for abstract later this year.

We are looking forward seeing many of you in Düsseldorf next year!

Kind regards,

Ellen, Remco, and Christoph

The 18th International Neurotoxicology Association Meeting

In 2021, INA has the opportunity to meet in Durham, North Carolina, USA, in the Research Triangle Park (RTP) Area, home to the National Institute of Environmental Health Sciences (NIEHS) and the US Environmental Protection Agency (US-EPA). It is also home to 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.



Meeting Plan

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 in 2021 meet in Durham, North Carolina, USA. At this venue there is a great local cadre of neurotoxicologists from government, academic and industry centers.

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*

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

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

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.

Call for papers – Special issues in *NeuroToxicology*

NeuroToxicology (2017 impact factor: 3.1) will be publishing two Special Issues. These will be ***Virtual Special Issues***, so submitted papers will go to print in the first available issue of *NeuroToxicology* upon acceptance. By publishing articles in the journal's first available issue (online and print), we ensure that accepted articles are fully citable without delay as with traditional Special Issue publication routes.

1) “Neurotoxicity of Drugs of Abuse” with Dr. Fang Liu (Food and Drug Administration, Arkansas) and Dr. Remco Westerink (Utrecht University, The Netherlands) as Guest Editors.

We believe this Special Issue provides an excellent opportunity to capture the attention of medical society and scientists to the present worldwide drug crises, to improve our understanding of the detrimental effects of drug abuse, and develop strategies to prevent/ameliorate drug addiction. We hope this special issue will cover a broad area of research (epidemiology, pharmacology, neurotoxicology, etc.) on drug abuse/addiction.

For details, please see <https://www.journals.elsevier.com/neurotoxicology/call-for-papers/call-for-papers-on-assessing-neurotoxicity-of-drugs-of-abuse>

2) “Influence of the Microbiome on Neurotoxic Outcomes” with Dr. Pamela Lein (University of California, Davis) and Dr. Jonathan Doorn (The University of Iowa) as Guest Editors.

We believe this Special Issue provides an excellent opportunity to engage the broader biomedical society in an exchange of information regarding the “state-of-the science”, and critical data gaps, with the goal of improving our understanding of the role of the microbiome in mediating neurotoxic outcomes from exposure to toxic agents. This special issue will cover a broad area of research (neurodevelopment, neurodegeneration, mechanisms of neurotoxicity) related to the influence of the microbiome on neurotoxicity and disease.

For details, please see <https://www.journals.elsevier.com/neurotoxicology/call-for-papers/the-influence-of-the-microbiome-on-neurotoxic-outcomes>

Submitted manuscripts may be original research or a review article. We would appreciate your consideration of submitting a manuscript and would like to get your confirmation and preliminary title of your contribution **by October 1, 2018** via an email to:

r.westerink@uu.nl (**Neurotoxicity of Drugs of Abuse**) or

pjlein@ucdavis.edu (**Influence of the Microbiome on Neurotoxic Outcomes**).

The timeline for final version submission is January 31, 2019. Please note that submission of a manuscript is not a guarantee of acceptance for publication in the journal. All manuscripts are subjected to the regular peer-review process of *NeuroToxicology*.

We are looking forward to hearing from you!

Call for special issue proposals - NeuroToxicology

The **INA-2017 special issue**, containing contributions from many of our members, is just completed! Check it out at <https://www.sciencedirect.com/journal/neurotoxicology/special-issue/109X3SKC2KQ>.

Given the recent affiliation of INA with the journal *NeuroToxicology*, you are also invited to organize a Special Issues 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).

Election of Officers for INA Executive Committee

Dear Colleagues,

It is time to nominate candidates for election to open positions in the Executive Committee of the International Neurotoxicology Association.

The officers whose terms will expire and the positions that will be open in September 2019 include:

President-Elect: Tim Shafer will ascend to the Presidency. This position is open to all members of INA except the current president (Remco Westerink who will become Past-President) and past-president (Ed Levin).

Treasurer: Harm Heusinkveld. The appointment is for 4 years and is open to all members of INA, including Harm, who is eligible for re-election and is willing to stand.

Secretary: Sandra Allen. The appointment is for 4 years and is open to all members of INA. Sandra has held the post for 8 years and will not seek re-election

Councillors: Helena Hogberg and Roberto Lucchini. The appointment is for 2 years and is open to all members of INA (including Helena and Roberto who are both willing to re-stand).

We need two candidates each for President-Elect, Treasurer and Secretary, and four candidates for Councillor. Please consider nominating yourself or worthy colleagues for these open positions. The Nominating Committee, chaired by Past-president Ed Levin, will take your nominations and assemble the final slate of candidates.

Please send your nominations to Sandra Allen (sandra.allen@regulatoryscience.com) by **December 31, 2018**.

News from our members

Tomás R. Guilarte had a very rewarding year; He was recently inducted into the Johns Hopkins University Society of Scholars (<https://hub.jhu.edu/2018/04/10/society-of-scholars-2018/>). Moreover, at this years' SOT meeting in San Antonio, Tomás was awarded the 2018 Hispanic Organization of Toxicologist (HOT) Distinguished Toxicologist Award for his outstanding professional achievements and career accomplishments. Congratulations Tomás!

Do you have some news to share? Let us know at r.westerink@uu.nl!

Membership application

If you are not a member yet, please join us to get a discounted rate for attending our biannual INA meetings, and the possibility to win the annual INA-NeuroToxicology Best Paper Award! Our dues are very low: only €50 or \$60 for two years, while a student membership is even without charge! So, fill out the application form at: <http://www.neurotoxicology.org/membership/>



International Neurotoxicology Association

