Message from the President

Dear all HOT members,

First, our thoughts and prayers for safety and recovery go out to our colleagues and their families impacted by the recent hurricanes and Mexico earthquake. Also, by the time this issue is released National Hispanic Heritage Month (September 15 to October 15 in the U.S.) will have passed and hopefully you were able to participate in an event to celebrate your heritage and culture and for those around us to recognize the vast contributions made by “Hispanic’s”. As members of HOT and your contributions to science, you are having a profound and positive influence on our future and demonstrating the value of diversity.

So, what has the HOT Executive Committee (EC) been up to these past months? We are engaged in planning for the upcoming 2018 SOT Annual Meeting and HOT events in San Antonio, Texas. On behalf of the HOT EC, I am pleased to announce that HOT will offer a Special Travel Award on Zika virus research, in addition to the traditional HOT Travel Awards in 2 different categories:

- Travel Awards for undergraduate, graduate or postdoctoral fellows.
- Distinguished Toxicologist Award

The opportunity to offer this Special Zika Award and a platform/poster session describing the various toxicological aspects of Zika virus research is due to the successful efforts of our HOT Past President’s Dr. Pedro Del Valle and Dr. Ofelia Olivero to establish an SOT Special Program on Zika virus research. This session(s) will complement a planned symposium on neuronal/developmental toxicity, infertility, therapeutics, and vector control, and will provide greater visibility to this significant global public health concern.

Information on how to apply to any of the HOT Travel Awards is found on our website, in Toxenlaces issues, on our Social Media, and in HOT Member emails, so please don’t forget to apply to either the HOT Student/Postdoc Travel Awards, the Distinguished Toxicologist Award, or the Special Zika virus Travel Award. The deadlines for application are typically in the January/February timeframe.

Finally, our membership continues to grow, our financial ledger remains healthy, and our Global Outreach and Sister Organizations efforts continue to produce outstanding results. As I have previously noted, there are many ways to support (and be involved in) HOT and its initiatives and activities, and all members are encouraged to share your ideas and needs with any member of the HOT EC.

The year is off to a great start in accomplishing HOT and SOT objectives, and I encourage all to keep abreast of HOT activities through our Social Media channels and our newsletter, Toxenlaces.

Warmest regards,

Robert P. Casillas, PhD
HOT President
Building Bridges Through Toxicology
Updates in Toxicology

Webinar series

“Characterization of a Sulindac Derivative in Human Lung Cancer Cells and an Orthotopic Mouse Model of Lung Cancer”

by

Dr. Verónica Ramírez-Alcántara
Assistant Professor
University of South Alabama Mitchell Cancer Institute, USA

October 26th, 2017
12:00 PM (Eastern Time)
11:00 AM (Central Time & Mexico City)

The conference will be held in Spanish

Registration Link
About the speaker

Dr. Ramírez came from Puebla City, Mexico, and performed her BS in Chemistry and Pharmacology at Benémerita Universidad Autónoma de Puebla. Dr. Ramírez also hold a M.S. and a PhD in Pharmacology from Centro de Investigación y Estudios Avanzados del Instituto Politécnico Nacional.

Since her childhood, Dr. Ramírez has been interested to know how the human body works and how drugs act once they are ingested.

Dr. Ramírez has studied the toxic effect in different types of pharmacological formulations in the gastrointestinal tract and has evaluated experimental cancer drugs.

II Toxicology Meeting Conferences/ Symposiums/ Posters November 8-10, 2017
More information: http://sotox.cl/ii-congreso-de-toxicologia/
Preparing Proposals

After Submission (Continuing Education)

After Submission (Scientific Sessions)

Submitting Proposals
LinkedIn is one of the most popular networking sites for professionals and a great virtual space to showcase you and your work, build connections and find new opportunities. Your LinkedIn profile is like a dynamic resume that you can use to your advantage to grow your career. However, a strong profile is key to making the best use of the LinkedIn interface. Below are some tips that you should consider when using this platform:

1.- Include a professional picture.

2.- Make sure you add your contact information such as emails, blogs or links to other professional personal pages, if applicable.

3.- Fill out the headline section, which is the first impression of you. It is a brief description of who you are and what you do. **Be short and direct and use keywords** that will help recruiters find you.

4.- Elaborate a summary of yourself which should include your background, your expertise and your overall professional interests. Be smart with your buzz words and make sure you are not overusing them or that you do not use highly overused words (a list can be found here: https://blog.linkedin.com/2017/january/25/better-than-buzzwords-2017-is-the-year-to-start-showing-itlinkedin).

5.- Add your education and work experience, including your current position. In this section you can also add specific achievements for each and describe your roles and expertise.

6.- Include your publication list, as well as certifications and languages.

7.- Share your honors and awards. You have earned them after all!

8.- Highlight your skills. LinkedIn also allows for your contacts to endorse you on different skills. Sometimes people endorse you for all sorts of skills. Make sure you accept endorsements that are true to your expertise and arrange them so that the most relevant and strong appear on top.

9.- Ask for LinkedIn recommendations. Make sure that the person that does this knows you and your work well and that they will write a positive recommendation.

10.- Showcase your volunteer work and causes you care about.

11.- Be smart about who you connect with. LinkedIn is a professional platform and as such, should only include your professional connections. Leave your friends and family for other social media platforms.

12.- Join and follow groups that you are interested in, belong to, or have been part of.

13.- Poor grammar, typos, and misspellings are a no-no. **Avoid them at all costs.**

14.- Keep your profile updated.

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**References**

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Sustainable production of food for an increasing population is of global concern. To further alleviate hunger and poverty, sustainable food production needs to be increased while taking care of resources such as water, energy, nutrients and land. However, intensifying agriculture led to negative effects on essential natural resources such as water and biodiversity as well as soil and its associated ecosystem services. Therefore, assessing the benefits and risks of a new technology prior to being applied to agriculture is a priority task to avoid adverse effects on human health and the environment.

The use of nanomaterials have emerged in the last two decades as a technology capable to reaching and improve all human activities including applications such as water treatment (1), soil amendment/restoration (2) and, recently, food production intensification (3). However, absorption, translocation, accumulation and biotransformation of engineered nanomaterials (ENMs) in food crops remains mostly unknown and its benefits and/or harmful effects to final consumers remains as pending topic (4).

To determine whether or not a specific ENM may pose a threat, rigorous physical and chemical characterization is needed as well as an accurate understanding of its biological activity. Plenty of reports exist related with the negative impacts of ENMs to plants; soil or the final consumers (5) and, at the same time, on the positive achievement of its use for a wide variety of improvements in the agri-food industry (6). In light of these controversial results, it is clear that a scientific gap exist in understanding the behavior, effects and its relation with the properties of ENMs that deserves immediate attention considering the potential risk related. Also, only limited information exist about the amount used and exposure of ENMs in food and food-related products.

ENM toxicology is a particularly complex task because the wide variety of core types, surface chemistry, agglomeration trends, and electronic properties shown by these materials which affect their reactivity and biological interactions along with their different uses, disposal, fate, transport and bioavailability (7). Nevertheless, the proper characterization of ENMs toxic responses from plants, microorganisms and animals is of major interest, mainly considering the lack of quantitative techniques to monitor its emission, and concentration in the environment or their fate once entered into food products (8).

As the trend for in purpose usage of ENMs in agricultural practices increases by the promise of improvement in current practices through the enhancement of management and conservation of inputs in crops, animal production and fisheries (9), the need of a careful analysis on the real advantages and threats generated by these products should get the highest priority among the scientific community, despite the emerging of novel so-called greener procedures for ENMs synthesis (10) or the argues claiming that naturally produced nanomaterials have interact with plants and animals since the primitive times on Earth.

From the past, we have learned that lacking of knowledge on the consequences of man-made products led to significantly regrettable results and we still are struggling with the aftermath of, for example, the use (and abuse) of agrochemicals (synthetic fertilizers, chlorinated pesticides). The potential benefits related for the use of nanotechnology in agriculture are tempting, just as chlorinated pesticides were at some moment around mid XX Century. There is a growing body of studies on the toxicity of ENMs to soil bacteria and their impact on other environmentally significant processes and properties, however in many of the cases the reports are not conclusive or even contradictory (5).
Nanotechnology has been reported capable of producing the expected outcomes in increasing productivity of crops to meet the challenges in food security (9), however its massive use is expected to face constraints related with regulations, and intellectual properties rights, among several others, and limited food productivity is not enough justification for unsecure use of ENMs. Ethical implications and public acceptance of use of ENMs in farmland and/or food production is another significant limitation. In the past, some ethic principles have been proposed suggesting systematic ways to enhance nanotechnology advantages and minimizing risks, regrettably multiple toxicological studies lacking of scientific rigor have generated questionable results that demerit the current efforts and bias the public opinion. It is worth noting that we, the scientific community, have to embrace the ethical duty of doing pragmatic research and scrupulously report our findings. History will judge whether we are in the preface of the real green revolution or just in the starting point of the next silent spring.

About the HOT Article authors:

**Dr. Ben Bandala**

Development and implementation of cutting-edge analytical approach to chemical and microbiological water quality is also within his areas of expertise. He holds a Ph.D. degree in Engineering, M.Sc. degree in Organic Chemistry and B.Eng. degree in Chemical Engineering. Dr. Bandala is author or co-author of over 100 publications including 68 peer-reviewed papers (average impact factor 2.7, >1530 citations, h-index 22); 5 books, 28 book chapters and 60 works published in proceedings of international conferences. He also possess wide experience working as consultant working with different companies along North and South America.

Biographical sketch taken from: http://www.dri.edu/directory/5205-erick-bandala

**José F. Delgado**

Fernando Arteaga-Cardona obtained his B.S. in Nanotechnology and Molecular Engineering from Universidad de las Américas Puebla, Puebla, México. His research interest is to design new magnetic nanomaterials for theranostics. He is currently a graduate student at Benemérita Universidad Autónoma de Puebla and is actively looking for Ph.D. opportunities in the US.

**About the HOT Article**

**Authors:**

Fernando Arteaga-Cardona obtained his B.S. in Nanotechnology and Molecular Engineering from Universidad de las Américas Puebla, Puebla, México. His research interest is the design of nanoparticle-based technologies for cancer diagnosis and therapy. José is currently a postbaccalaureate fellow at the National Institutes of Health. On fall 2018, he will attend his Ph.D. studies in Bioengineering.

Biographical sketch taken from: http://www.dri.edu/directory/5205-erick-bandala

References

Magnetic nanomaterials (< 100 nm; diameter) are gaining a lot of interest in the biomedical field due to their potential use as MRI contrast agents, heat generators for hyperthermia, drug carriers, among others [1]. Despite these promissory applications, there is a considerable concern due to the toxicity of these nanomaterials. Some of the physical and chemical properties that contribute to toxicity when using magnetic nanoparticles are formation of aggregates, ion release of nanoparticles and shape. Herein, we will discuss some of the factors to consider when designing safe magnetic nanoparticles for biomedicine.

Agglomerates

When a group of sub-micrometric magnetic particles are exposed to their own magnetic field, they tend to attract themselves causing large clusters or agglomerates. The sizes that can reach these aggregates can be up to microns or even millimeters. The agglomerates can be large enough to form clots in arteries or veins [2]. In addition, aggregates might induce immunogenicity after administration leading to their rapid excretion and thus decreasing their intended effect for diagnosis and therapy [3].

One way to overcome the aforementioned effects produced by agglomeration in magnetic nanomaterials is using superparamagnetic nanoparticles [4]. Superparamagnetic nanoparticles are promissory for biomedical applications because they have a negligible remanent magnetization and coercivity. Meaning that the interaction of nanoparticles when are magnetized each other will be insignificant. However, when an external magnetic field is on, the particles will behave like a normal magnetic material, as needed for hyperthermia or drug carrying.

A magnetic material can enter the superparamagnetic state when the thermal energy, expressed as $E_T = k_B T$ (kB, Boltzmann’s constant; T, Temperature), is larger than the energy barrier of the material expressed as $E_B = KV$ (K, anisotropy energy; V, average volume of the nanoparticles). This means that when the energy from the temperature is higher than the energy of the material that maintain the spins in a preferred direction, the magnetic spin would be able to move freely. From the energy barrier formula it can be deduced that smaller nanoparticles will have higher chance to be in the superparamagnetic state, thus, nanoparticles with < 50 nm diameter size are preferred to avoid magnetic aggregation [5].

Toxicity by elemental composition and surface

Most of the magnetic materials that are known, contain some elements (e.g. holmium, nickel, neodymium, samarium, etc.) that, at relatively low concentrations, cause adverse effects such as ROS production, tissue-specific bioaccumulation decrease on the antioxidant capacity, among others [6]. This limits the types of magnetic materials that could be used for the applications discussed earlier, as the material might release small quantities of those elements.

One of the most employed family of magnetic materials used for biomedical applications are ferrites, which has a chemical formula of MFe$_2$O$_4$, where M is a cation with a 2+ valence like Fe$^{2+}$, Zn$^{2+}$, Mn$^{2+}$. Due to the ferrites composition, the toxicity risk decreases considerably, although they aren’t completely safe. Our research group has found that ferrites mainly affect cell’s viability in hemocytes, which agrees with other studies of different cells [7], and the magnetic properties of ferrites (magnetic saturation) are not as good as other magnetic nanoparticles. However, they are still less toxic in comparison with rare-earth-containing nanoparticles [8].
There are two main strategies to reduce toxicity in magnetic nanomaterials, the first is to use biocompatible-polymeric coatings or another non-toxic shell to cover the nanoparticles, and the second is to enhance the magnetic properties of a low-toxic material like ferrites. Coating the magnetic nanoparticles with a biopolymer decreases toxicity and allow functionalization with biomolecules for specific cell targeting. The downside of using biopolymer-coatings is that the material can be degraded by pH changes, and the extra layer decreases the magnetic properties of the material. Some of the best coatings that reduce toxicity are chitosan, dextran, and gold [9]. Enhancing the magnetic properties is not an easy task, neodymium or chromium ions need to be inserted into the material structure. These impurities are harmful at high concentrations, nevertheless, toxicity could be substantially decreased by lowering the amount of neodymium or chromium ions. Recent studies are using this strategy to enhance the magnetic properties while reducing toxicity [10].

Shape

The most common shapes that magnetic nanoparticles are synthesized are spheres, cubes, and rods. The sphere shape is reported to be the one which causes less damage to cells. Despite that, the sphere shape is the one with lower magnetic properties in comparison with other morphologies. Rods are the shapes with better magnetic properties, but it is reported that rods act like spears piercing the cell membrane. Magnetic cubes, especially with round edges, are found to be the preferable shape that nanoparticles should have since it has better magnetic properties, and do not damage the cell membrane as much as the rods [11].

Studying the physical and chemical properties of magnetic nanomaterials is crucial to understand and evaluate their toxicity effects when tried to be used in biomedicine. From the mentioned factors, it was discussed how agglomeration, elemental composition, surface and shape challenge the use of magnetic nanomaterials in the biomedical field. From this, it is of paramount importance to converge areas like materials science and biology with an interdisciplinary team to find biocompatible magnetic nanomaterials that satisfy their application as diagnostic and therapeutic agents.

References


Disclosure

The ideas expressed in this article are exclusively from the authors and do not represent ideas reflected from the National Heart, Lung and Blood Institute and Benemérita Universidad Autónoma de Puebla.
HOT Trainee wall: Montserrat Rojo de la Vega

My name is Montserrat Rojo de la Vega, I am originally from Mexico City, where I got my BS in Biology and my MSc in Molecular Oncology at National Autonomous University of Mexico.

In 2012, I joined the lab of Dr. Donna Zhang at the University of Arizona, Tucson, where I am a PhD candidate in Cancer Biology. I study cellular stress responses and I have been developing cancer chemoprevention strategies using natural compounds.

What is going on?

Exposure to ultraviolet (UV) radiation from the sun and tanning beds is associated with premature aging and skin cancer (1). UV causes direct and indirect damage to DNA, proteins, and lipids by the generation of reactive oxygen species (ROS) (2). While excessive exposure to UV can be prevented or reduced with physical or chemical shields, enhancing cellular protective mechanisms with chemopreventive compounds is a feasible strategy to protect the skin.

Chemopreventive compounds, such as those found in dietary sources, constitute a safe and effective approach to activate the antioxidant protein NRF2 (3). NRF2 is a transcription factor responsive to ROS and other environmental stresses that activates the expression of antioxidant enzymes and proteins that remove damaged cellular components (4). Our lab has identified that a compound from the achiote (annatto) spice effectively activates NRF2 and protects against acute UV exposure in a mouse model (5). Our current efforts are focused on establishing preclinical models of NRF2-based UV skin protection.

References


The next 2018 SOT meeting will have a platform/poster session on various toxicological aspects of Zika virus research. This session(s) will complement a planned symposium organized by HOT on neuronal/developmental toxicity, infertility, therapeutics, and vector control, and will provide greater visibility to this significant global public health concern.

For the 2018 SOT Annual Meeting, in addition to the HOT Travel Awards and Distinguished Toxicologist Award, HOT is proud to offer the Special Travel Award on Zika Virus Research.

The Special Travel Award will consist of monetary funds to help with the associated costs of presenting their research and attending the SOT Annual Meeting and a beautiful plaque for your lab or office space.

**Who may apply?** To apply for the HOT Travel Award, candidates must comply with the following requirements:

1) Applicant must be a **HOT member of Hispanic/Latino origin at the time of nomination**.

2) Applicant must be **first author of an abstract submitted and accepted** for the upcoming SOT Annual Meeting.

3) The awardees must attend the HOT Travel Award Ceremony in order to be officially recognized as the recipients and get the financial award and plaque.

**Applicable Documents:** Applicant must submit a copy of the complete abstract accepted by SOT and a letter of recommendation (not to exceed one page). The letter must be written in English.

All documents are to be emailed to both: Aline de Conti, HOT Awards Committee Chair; José Francisco Delgado Jiménez, Co-Chair.

**Note:** the deadline for all submission materials is **January 12, 2018, 11:59 PM EST.**
**Award Description:** The Hispanic Organization of Toxicologists (HOT) has provided Travel Awards since 2005 to outstanding students and postdoctoral trainees of Hispanic/Latino origin working in the area of toxicology research. The HOT Travel Award consists of monetary funds to help with the associated costs of presenting their research and attending the SOT Annual Meeting and a beautiful plaque for your lab or office space. The HOT Travel Awards are provided by funds of HOT sponsors. HOT will give preference to first-time applicants with a high quality research background. Previous recipients may apply with the understanding that the likelihood of winning a second award may be linked to funding availability after all first-time applicant recipients have been selected.

**Who may apply?** To apply for the HOT Travel Award, candidates must comply with the following requirements:

1) Applicant must be an **undergraduate, graduate or postdoctoral fellow**.

2) Applicant must be a **HOT member of Hispanic/Latino origin at the time of nomination**.

3) Applicant must be **first author of an abstract submitted and accepted** for the upcoming SOT Annual Meeting.

4) The awardees must attend the HOT Award Ceremony, or have a representative, in order to be officially recognized as the winners and get the financial award and plaque.

**Applicable Documents:** Applicant must submit a copy of the complete abstract accepted by SOT and a letter of recommendation from a mentor (not to exceed one page). The letter must be written in English.

All documents are to be emailed to both: Aline de Conti, HOT Awards Committee Chair; José Francisco Delgado Jiménez, Co-Chair.

Deadline: Documents must be received on or before **January 12, 2018, 11:59 PM EST**.
The Distinguished Toxicologist Award is given each year to a toxicologist of Hispanic origin whose work exemplifies the mission of the HOT-SIG by contributing to the advancement of the field of toxicology. Scientific and/or regulatory accomplishments and/or community services will be considered during the review. The HOT Distinguished Toxicologist Award consists of a beautiful recognition plaque for your lab or office space.

Who may apply? To apply for the HOT Travel Award, candidates must comply with the following requirements:

**Nominator** – *The nominator for the HOT Distinguished Toxicologist Award Candidate shall be a member of SOT and/or a member of HOT at the time of nomination.*

**Nominee** – *Nominee shall be a member of HOT at the time of nomination.* *Self-nominations will not be accepted.*

The application will be reviewed according to one or more of the following criteria:

1) Nominee’s scientific achievements in toxicology have had major impact on the field and stimulated new directions in their area of expertise.

2) Nominee’s contribution to the scientific progress of toxicology by their participation in the creation and/or implementation of regulations.

3) Nominee’s contribution to promoting their institution’s mission.

4) Nominee has been actively involved in SOT and/or HOT leadership.

5) Nominee has served in mentoring, community service, and/or at a national or international level with decision-making and/or advisory activities.

6) Nominee’s activities have had major contributions and impact on the application of toxicological sciences and on the protection and promotion of public health.

**Nomination package:**

1) The nominee’s Curriculum Vitae in English (PDF format), including a complete list of nominee’s publications.

2) One letter of nomination that must include a detailed description of how the nominee has fulfilled or is fulfilling one or more of the criteria stipulated above. The letter should be addressed to the HOT Distinguished Toxicologist Award Committee. The letter must be written in English.

To nominate a colleague for this award, please submit a complete nomination package to Aline de Conti, HOT Awards Committee Chair; and José Francisco Delgado Jiménez, Co-Chair.

**Deadline:** Documents must be received on or before January 12, 2018, 11:59 PM EST.
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If your Hispanic Organization is planning a Toxicology meeting or if you are organizing a Toxicology event intended for a primarily Hispanic audience, and want to promote it, send an email to María Cárdenas González (Councilor for Sister Organizations) at Mariana_CardenasGonzalez@hms.harvard.edu for more information for its inclusion in upcoming Toxenlaces issues.
HOT wants you to be part of the organization! To make it available to everyone, HOT accepts applications from non-SOT members to become HOT members. Yes, that is right!! You only have to have the desire to collaborate with and be part of our great organization.

Your HOT membership provides you with valuable resources throughout your scientific career as for networking through the largest Hispanic toxicologist community, giving you opportunity for Travel Awards or serving as a mentor to the young Hispanic toxicologists; besides you receive the *Toxenlaces* newsletter every two months.

Application and more information can be found at Non-SOT Member Application. So, what are you waiting for? We are looking forward to receiving your application today!!

Follow us on Facebook at: [http://www.facebook.com/hispanicorganizationoftoxicologists](http://www.facebook.com/hispanicorganizationoftoxicologists)


- *Toxenlaces* is the newsletter that informs Hispanic toxicologists in the United States and the international Spanish and Portuguese-speaking scientific communities about important toxicological events and issues occurring in our countries. It is electronically published and distributed to our membership and Sister Organizations in Ibero-America. *Toxenlaces* disseminates critical dates for events, health perspectives, and funding and training opportunities. It serves as a toxicology forum for our members and other partner organizations, engages in educational outreach to the Hispanic communities and provides the essential elements to support networking among Hispanic toxicologists. *Toxenlaces* is open to receive collaborations from HOT and SOT members, and Sister Organizations. You can collaborate with short scientific articles, news or notes related with toxicology. Other ways to collaborate is by nominating your peers or yourself for the sections Trainee Section and When I Grow Up. For more information about collaborating with *Toxenlaces* send an email to Jose Delgado (Toxenlaces Editor) at jose.delgadojz@gmail.com with copy to Alejandro Ramirez-Lee (Toxenlaces Assistant-Editor and Graphic designer) at alejandroramirezlee@gmail.com

The views expressed in this *Toxenlaces* issue do not necessarily represent those of the Hispanic Organization of Toxicologists (HOT) or Society of Toxicology (SOT).