Toxics Use Reduction Institute Science Advisory Board Meeting Minutes
September 23, 2021
Virtual Zoom Meeting
12:00 PM

Members Present: Dave Williams (Chair), Robin Dodson (Vice Chair), Christy Foran, Christine Rioux, Heather Lynch, Helen Poynton, Wendy Heiger-Bernays, Rich Gurney, Lisa Cashins, Denise Kmetzo

Members not present: Amy Cannon

Program staff present: Liz Harriman (TURI), Heather Tenney (TURI), Hayley Hudson (TURI), Michael Ellenbecker (TURI), Tiffany Skogstrom (OTA), Caredwen Foley (OTA), Sandy Baird (MassDEP), John Raschko (OTA), Kari Sasportas (OTA)

Others present: Katherine Robertson (MCTA), Carol Holahan (Foley Hoag ACC), Christina Bramante (Nano-C), Tom Lada (Nano-C), Jerome Lang (Nano-C), Erin Desantis (ACC), David Jones (LSI)

Welcome & Introductions

Please note that this meeting is being conducted remotely, consistent with An Act Extending Certain COVID-19 Measures Adopted during the State of Emergency. This Act includes an extension, until April 1, 2022, of the remote meeting provisions of Governor Baker's March 12, 2020, Executive Order resulting from the outbreak of the 2019 novel coronavirus, known as "COVID-19."

Board members introduced themselves, program staff were announced and attendees were asked to put their name and affiliation in the chat before it is turned off to visitors.

Program Updates

- The Administrative Council voted to list Per- and Polyfluoroalkyl Substances Not Otherwise Listed (PFAS NOL) to the TURA List, based on the SAB's recommendations which did not include the ultra-short substances. A public comment period will open on September 24th concerning these proposed amendments and there will be a virtual public hearing on October 15th, 2021
- TURI's annual Fall Continuing Education Conference is being held virtually on Nov 4th and 9th including a session on PFAS on the 9th.

Amendment to QAC vote

At the May 20th meeting the SAB voted on QACs. The number of substances from the EPA Final Work Plans was referenced in the vote and that number was referenced incorrectly. The SAB vote referenced "19 CAS: 14 ADBAC and 5 DDAC" and there are actually 24 individual CAS Numbers: 19 ADBAC and 5 DDAC in the EPA Final Work Plans; the same lists that were included on the SAB's EHS Summaries used during deliberations.

For reference here is the May 20th QAC vote: ***SAB Recommends listing QACs as listed in the Environmental Protection Agency's Final Work Plans (19 CAS: 14 ADBAC, 5 DDAC) on TURA list due to respiratory system irritation and inflammation including those outcomes consistent with occupational asthma and work-exacerbated asthma; corrosivity; hazard for aquatic life, environmental fate and***

persistence. The SAB also has additional concerns for reproductive effects and neural tube development.

A motion was made to amend the vote previously adopted on May 20th to correct the number of QAC referenced in the Final Work Plans as 24 CAS: 19 ADBAC, 5 DDAC.

- A roll call vote was taken and the motion was approved with 8 in favor and 1 abstention, and 2 not present.

Approve June Meeting Minutes

A motion was made to approve the June minutes as written, and there was a second. A roll call vote was performed and the minutes were approved with 8 in favor and 1 abstention.

Carbon Nanotubes and Fibers Petition

Heather gave an update of where the board is at with the nanomaterials discussion and the information that has been collected and received from board members. All the papers from the LibGuide are in the Draft Nano Matrix Excel file, with information on the specific endpoints researched, summary of results, and several other characteristics that may be of importance when looking at these substances. Today the goal is to talk through the materials and review the different endpoints.

Carcinogenicity

Board members tasked with this endpoint summarized the information and research they each reviewed.

- There is a data gap for the carcinogenicity endpoint in the GreenScreen for single walled carbon nanotubes (SWCNT), and there is less information in comparison to (MWCNT).
- Board members expressed that they would like more recent information on other substances than MWCNT and specifically other than MWCNT-7.

Genotoxicity

- Coatings play a role.
- The level of impurity, exposure route, and the specific assays used were suggested as factors to add to the matrix.
- Expressed the importance of non GLP assays and the valuable information they can provide.
- Comet assay is an older method but it has experienced a revival in use with newer quantitative methods, and some of the evidence demonstrates this.
- Discussion on whether or not fibers enter the cell and if these tests will be valid for those substances.
- Dong and Ma (2015) was noted as a key study.

Pulmonary Toxicity

The differences in physical and chemical properties affect how they impact humans and it makes it very challenging when trying to group them together.

- Plenty of evidence for inhalation especially for MWCNT
- Weight of evidence is focused on fibrosis and other early onset effects
- Fibrosis was persistent and progressive even after study ended

- Hoping to see more human studies focused on downstream effects
- The lung is a target organ particularly for the MWCNT
- A lot of evidence in animal studies for both SWCNT and MWCNT
- Would also like to see SWCNT and MWCNT migration, translocation, and systemic effects and understand differences between single walled and multiwalled
- Mercer (2013) and Dong and Ma (2015) were recommended as helpful papers for this endpoint. Mercer (2013) also shows CNTs moving to the diaphragm and kidneys.
- Discussion around aerosolized CNTs and the difficulty in being able to aerosolize these substances in order to study them. NIOSH had to design a generator itself when they were doing their research.
- Interested in seeing studies on how biomarkers connect to disease

Environmental Toxicity

Board members discussed the information they reviewed related to environmental toxicity, fate, transformation and breakdown of these substances. Further discussion was had on how in-depth the board's research will go into functionalization and it was suggested to define a scope sooner rather than later.

- Greenscreen concludes low acute aquatic toxicity, and high chronic aquatic toxicity.
- In papers reviewed, they saw physical modes of action rather than chemical
- It takes high concentrations to cause physical blockage of digestive glands, GreenScreen indicates they are not very bioacculumative.
- Are functionalized CNTs more toxic? Or the same? E.g., functionalization may not change a physical impact on an organism. Will they be more likely to be transformed in the environment?
- In sediment, more stays in sediment than goes into organism.
- Highly persistent in GLP studies and there was no breakdown of single walled and multiwalled.
- Would like more information on environmental breakdown and possibly other organisms that may ingest these substances.
- A board member recommended Nel (2009) as a helpful paper on the interface between nanomaterials and biological systems.

Suggestions on the matrix:

- Human data and biomarkers
- Tangled, rigid, agglomerated, or not
- Impurity level – including percentages
- Exposure route
- Specific assay
- Functionalization – Y/N?

Visitor comments

- Responded to comment about publicly accessing the GreenScreens in chat.

Next Meeting

It was suggested that the board would focus on MWCNT. The LibGuide will be prepared for the next meeting to include a current literature review of only MWCNTs.

Heather will send out a doodle poll for a meeting in November.

A motion was made to adjourn.

Visitor Comments (inserted verbatim from zoom chat)

From David Jones to Everyone: 12:04 PM
David Jones, LSI Sr. Mgr.
From Tom Lada to Everyone: 12:05 PM
Tom Lada - Nano-C, Inc.
From Jerome Lang to Everyone: 12:05 PM
Jerome Lang, EHS Manager, Nano-C
From Carol Holahan to Everyone: 12:05 PM
Carol Holahan, Foley Hoag
From John Raschko to Everyone: 12:06 PM
John Raschko, Mass. Office of Technical Assistance (OTA)
From Kari Sasportas to Everyone: 12:07 PM
Kari Sasportas, MA OTA, Outreach & Chemical Policy Analyst
From Caredwen Foley, MA OTA to Everyone: 12:07 PM
Caredwen Foley, MA OTA
From Christina M. Bramante, Representing Nano-C to Everyone: 12:09 PM
Christina Bramante, Representing Nano-C
From wendy Heiger-Bernays to Everyone: 12:27 PM
I apologize for being late. Oral Qualifying exam.
From Liz Harriman to Everyone: 12:27 PM
Welcome, Wendy!
From Christina M. Bramante, Representing Nano-C to Everyone: 12:31 PM
Question regarding the GreenScreen Assessments - the basis for the hazard determinations are missing. Please can you tell us when this information will be available. Thank you.
From Liz Harriman to Everyone: 12:32 PM
We'll let the board go thru their review and then we will ask for questions from visitors, so hold that thought!
From Heather Tenney to Everyone: 12:37 PM
Christina, this should work now:
https://www.turi.org/Our_Work/Policy/Toxics_Use_Reduction_Act/Councils_and_Committees/TURA_Science_Advisory_Board/Science_Advisory_Board_Meeting_Minutes/September_23_2021_-_Nanomaterials/Accessing_Nanomaterial_GreenScreens
From Christina M. Bramante, Representing Nano-C to Everyone: 12:45 PM
Thank you Heather.
From Christina M. Bramante, Representing Nano-C to Everyone: 01:25 PM
Thank you again.