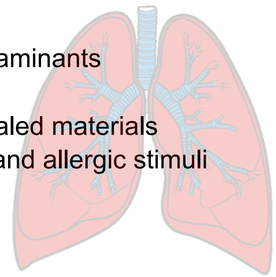
INHALATION AND RESPIRATORY SPECIALTY SECTION

Description

The Inhalation and Respiratory Specialty Section provides a focus for members of the Society of Toxicology dealing with the impact of airborne chemicals and particles on the body. The Section meets regularly at the SOT Annual Meeting to promote a better understanding of inhalation and respiratory tract toxicology, to recognize students and colleagues for notable contributions to research, and to address issues of importance to this field. IRSS sponsors webinars and other educational opportunities.

Issues of Interest



- Indoor and outdoor air pollution
- Occupational exposure to airborne contaminants
- Therapeutic drug delivery by inhalation
- Deposition and pharmacokinetics of inhaled materials
- Interactions between inhaled materials and allergic stimuli
- Airway injury from systemic toxicants
- Systemic injury from airway exposure
- Biomarkers of exposure and disease

Membership Benefits

- Network with inhalation and respiratory toxicologists from industry, government, and academia.
- Present your work in sponsored and selective specialty sessions.
- Mentoring junior members.

Reception and Awards Meeting

Thursday, May 21, 2020

2:30 PM – 4:00 PM EDT

Virtual Meeting via Webex

Please join us to honor our award winners and discuss member involvement.

Executive Committee 2020-2021

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Sponsored Events at SOT Virtual Meeting

Webinars:

- "Electronic Cigarettes and Cardiovascular Toxicity: New Friend or Old Foe?" (4/28/2020)
- "Resolution of Inflammation in Chemical Toxicity/Tissue Injury: What's Emerging?" (5/12/2020)
- "Sex, Lungs, and Air Pollution" (6/11/2020)

Continuing Education:

- "In vitro approaches to assess the toxicity of inhaled substances" (5/15/2020)
- "Lung Function: It's Not Just Breathing" (6/26/2020)

Upcoming hot topic seminar topics will focus on the outbreak of e-cigarette, or vaping-associated, lung injury (EVALI), including epidemiology, clinical perspectives, forensic evidence, and potential mechanisms.

IRSS 2020 Award Winners

Career Achievement Award: Urmila Kodavanti, US EPA
Young Investigator Award: Phoebe Stapleton, Rutgers/SUNY
Donald E. Gardner Education Award: Cody Smith, Rutgers
Mary Amdur Student Award: Elise Hickman, UNC Chapel Hill
Graduate Student Award: Christina Awada, NYU
Postdoctoral Awards: Tosifa Memon, University of Utah
Paper of the Year Award: Meghan Rebuli, UNC Chapel Hill

Inhalation Toxicology Through the Ages

79 CE: Mount Vesuvius Erupts
Destroys Pompeii and Herculaneum, suffocating Pliney the Elder.

535 CE: Air is a Birthright
Roman Emperor Justinian proclaims, "By the law of nature these things are common to mankind – the air, running water, the sea."

673 CE: Greek Fire
Ancient "napalm" described by the Crusaders as consisting of naptha, quicklime, Sulphur, and saltpeter.

0-1000 CE

1306: Sea Coal Burn Ban
Blacksmiths exempt, compliance and enforcement prove difficult.

1480: Incas in the Bronze Age
Using core samples obtained from the Quelccaya ice cap in Peru, the Incas begin smelting bismuth in the late 1400s. Signs of air pollution swiftly rise once the Spanish conquer the Incas in 1533.

1556: Tobacco Arrives in Europe
Brought by French diplomat and scholar Jean Nicot. Nicotine is named after him.

1000-1700

1700-1900: Industrial Revolution
Mining and combustion of coal increases from 2.7 million tons in 1700 to 250 million tons in 1900. Percival Pott (1775) notes increased incidence of cancer among chimney sweeps.

1863: Alkali Act Passed
Establishment of the Britain's first pollution inspectorate following extensive property damages caused by emission of hydrogen chloride gas.

1880s: London's "Killer" Smog
Brought on by temperature inversions in January, deadly smog events in London begin to increase in duration and severity.

1700-1900

1909: Glasgow Smog
Smog events result cause 1,000 deaths in "Auld Reekie" a town long known for its coal-fire smoke emissions. 'Smog' is coined from 'smoke-fog' by Dr. Harold Antoine Des Voeux in a 1911 report about the incidents.

1915: Chemical Warfare a Reality
German chemist Fritz Haber developed chlorine and cyanide gases, which were used as blistering agents in WWI.

1928: U.S. PHS Monitors Air
Routine monitoring of air pollution in major eastern U.S. cities begins.

1900-1920

1930: Hawk's Nest Incident
Hundreds of African-American workers died between 1927-1935 of acute silicosis while digging a hydroelectric tunnel for Union Carbide.

1935: The Dust Bowl
Clouds of dust from years of drought cause thousands of deaths due to particle exposure and starvation in the Great Plains.

1930s

1941: St. Louis Post Wins Pulitzer
First Pulitzer Prize for environmental reporting awarded following the 1939 St. Louis smog episode that blocked sunlight for a week, resulting in the first smoke ordinance enacted by a U.S. city.

1942: The Holocaust
1.1 million European Jews and POWs were murdered using hydrogen cyanide gas (Zyklon B) in Nazi extermination camps.

1948: Donora, PA Smog
A weather inversion concentrated sulfuric acid, nitrogen dioxide and fluorine in a smog, killing 20 and sickening over 7,000.

1940s

1950: Smoking & Lung Cancer
Sir Richard Shaboe Doll and Bradford Hill publish first paper linking smoking and lung cancer.

1952: London Great Smog
Caused or contributed to as many as 12,000 deaths. Continued smog events results in the 1956 Clean Air Act by British Parliament.

1954: Mary Amdur
Presents her work on low dose health effects of inhaled sulfuric acid and sulfur dioxide to severe pushback. Today, the Mary Amdur Endowment supports student awards.

1950s

1960: SOT Established
To create a safer and healthier world by advancing the science and increasing the impact of toxicology.

1961: Vietnam War
U.S. spraying of herbicides results in TCDD exposure to Vietnamese citizens and deployed military personnel via widespread routes, including inhalation. Exposure linked to birth defects, cancer, diabetes, and Parkinson's Disease. Recent evidence suggests of health risks in the grandchildren of Veterans.

1960s

1971: U.S. EPA Established
In addition to establishing the EPA, the 1970 Amendments of the Clean Air Act, first passed in 1963, authorizes for the regulation of industrial and mobile sources of air pollutants. In 1971, EPA names 4 oxidant criteria pollutants, adding lead to the list in the mid-1970s.

1973: Leaded Gasoline Phase Out
Following longstanding suspicion of the neurotoxic effects of lead, increased lead in children and the introduction of the catalytic converter resulted in the EPA to require a gradual reduction in gasoline lead content. Within 20 years, the number of children with elevated lead levels dropped by 98%

1970s

1982: SOT's IRSS Established
By James Stevens (President) and Don Gardener (Vice President).

1986: Bhopal Disaster
Accidental release of 40 metric tons of methyl isocyanate from a Union Carbide pesticide plant killed thousands.

1986: Chernobyl
Nuclear reactor accident results in largest nuclear disaster in history. Those living within 30 km of the plant inhaled up to 1000 mSv (adults) and 6000 mSv (infants) of radioactive iodine, an isotope known to cause thyroid cancer.

1980s

1993: Harvard Six Cities Study
Groundbreaking study found a strong link between air pollution and mortality risk, spurring improved U.S. regulations on fine particulate matter.

1995: Tokyo Subway Sarin Gas
Members of religious group Aum Shinrikyo released sarin gas in Tokyo subways, killing 12 and injuring 6,000.

1999: Libby, MT Asbestos
The EPA warns that anyone living in this northwest Montana town for six months any time before January 1991 was most likely exposed to harmful levels of asbestos.

1990s

2001: World Trade Center Attacks
9/11 Terrorist attacks result in the deaths of almost 3,000, releasing large amounts of dust containing fiberglass, asbestos, metals, and VOCs into the air. As of 2019, 32,000 cases of respiratory/ digestive diseases and 9,000 cancers, resulting in over 700 and 600 deaths, respectively, have been reported in first responders.

2008: Kingston Coal-Ash Spill
In the largest coal ash spill in the U.S., 1.1 billion gallons of coal fly ash slurry was released into the Emory River. Nearly 40 deaths and 250 cases of illness have been linked to the remediation effort and failure to provide PPE to employees.

2000s

2015: Beijing Air Pollution
A striking difference in air quality is observed after Beijing achieves clear blue skies in time for a military parade. Less than 24 hours later, Beijing AQI shoots from 17 to 160+.

2016 & 2018: New Delhi Air Pollution
PM 2.5 reached up to 550 µg/cm3 in November 2016, leading to poor visibility, increased mortality from respiratory diseases, and grounding of flights.

2019: EVALI Outbreak
Outbreak of e-cigarette, or vaping, associated lung injury primarily associated with illicit THC products.

2010s

2020s +

Current & Future Challenges

COVID-19

Wildland Fires

Burn Pit Emissions

PFAS

E-Cigarettes

Climate Change