A Proverb: “If You Want to Go Fast, Go Alone. If You Want to Go Far, Go Together”

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HOMEChem: House Observations of Microbial and Environmental Chemistry

Dr. Olsiewski is a Contributing Scholar at the Johns Hopkins Center for Health Security. She is a pioneering leader in policy and scientific research programs in the microbiology and chemistry of indoor environments.

During her 2 decades at the Alfred P. Sloan Foundation, she led innovative and multidisciplinary programs that inspired, accelerated, and produced lasting impact. Governmental and for-profit stakeholders fostered innovation and built research capacity through the creation of diverse stakeholder networks. Her accomplishments include the creation and direction of the microbiology of the built environment, chemistry of indoor environments, and biosecurity programs.

Dr. Olsiewski is recognized as a leading expert in biosecurity and is a member of the Council on Foreign Relations. She is Chair of the US Environmental Protection Agency (EPA) Homeland Security Research Subcommittee and is a member of the EPA Board of Scientific Counselors Executive Committee. She is also a member of the NTI|bio Working Group for Biosecurity Innovation and Risk Reduction Initiative and Fellow of the American Association for the Advancement of Science in chemistry.

Nuggets mined from today’s episode.

Paula is a master of building interdisciplinary collaboration and trust.

As a youngster, Paula was interested in science experiments such as growing crystals, using salt to change the freezing temperature of water. She credits her high school chemistry teacher for inspiring her interest in chemistry.

Paula has two gifts: practicality and the ability to bring people from multiple disciplines together to share knowledge and information.

With a background in chemistry, bioterrorism and IAQ she is leading a team to develop indoor pandemic policy.

Sloan research programs generally last between 5-10 years, with a total of $25M-$50 MM in grant funding

Studying bacteria was easier than studying viruses due to the availability of bacterial marker genes for DNA sequencing.

In 2016 Dr. Jordan Peccia, PhD at Yale University suggested that an interdisciplinary group of Sloan Foundation grantees, team-up with infectious disease experts and aerosol scientists in Singapore for a Workshop on Infectious Disease Transmission in the Built Environment

Good research can often have unanticipated benefits.

She credits the vision of university professors for helping us find the way.

Dr. D.A. Henderson, physician, epidemiologist, and self-described disease detective doctor is credited for stamping out smallpox. After learning that Russia had violated a treaty and was clandestinely developing bioweapons started a civilian biodefense organization which is now known as the Johns Hopkins Center for Health Security.

Medical people have studied old aerosol physics from the 1930s -1940s. The WHO and CDC focused on fomite and close contact and would not recognize the COVID19 virus is airborne. 280 scientists signed an open letter to WHO, corona virus is airborne and requesting WHO to change their recommendations. People fixated on hand-washing and surface cleaning are encouraged to make or buy air cleaners.

Inspired by a nephew who told her that “abstinence doesn’t work” Paula co-wrote an Op Ed in USA Today: https://www.usatoday.com/story/opinion/2020/11/25/covid-and-thanksgiving-how-prevent-spread-column/6407147002/

In an effort to make buildings safer from bio-threats, Paula has recruited outdoor air scientists to work indoors.

Before the pandemic Paula didn’t appreciate the poor air quality found in many schools.

Paula and her husband reside in a Manhattan apartment building built after the 1918 Spanish Flu Pandemic. The building has building windows on opposing walls and big radiators for heat. She uses HEPA air cleaners and humidifiers. She’s purchased a CO^2 meter and uses it to monitoring the air while cooking and entertaining. She also recently purchased a particle counter. When non-occupants come over, windows open and everyone wears masks.

HomeChem

Sloan began supporting the Chemistry of Indoor Environments Program in 2013, after meeting with a group of indoor and outdoor chemists in 2012. Paula met the HomeChem primary researchers, Professor Delphine Farmer at an indoor chemistry workshop in Lille, France and was introduced to Professor Marina Vance by Professor Linsey Marr. Seeking a field campaign, they settled on the test home at the University of Texas/Austin. There are 22 million similar homes in the US. 60 researchers (chemists and building people) using 4.5 million dollars of instruments and equipment converged at UT to study what happens indoors during occupancy, cooking and cleaning. The HVAC system can be controlled. Two Thanksgiving dinners have been cooked, eaten and cleaned up after. Bleach and terpene cleaners have been comparatively studied. It’s more likely the increase in CO^2 indoors is more likely to make occupants tired than the L-Tryptophan in the turkey.

Goals of HomeChem, break down barriers to information sharing and create a research community.

Modelers can do things that can’t be done physically or financially. For example: John Abbott, University of Toronto has found that PAHs when oxidized form a

crust. Vicki Grassian & Manabu Shiraiwa asked this question: Why do hydrophobic substances stick to glass? We need the combination of both experimentation and modeling to learn why and how?

Indoor chemical levels are much higher indoors than outdoors.

Supplements don't work but people who take supplements are healthier. Paula takes supplements recommended by her doctor.

Where is HomeChem headed?

- COVID related restrictions resulted in some research delays.
- 12 papers on findings will be published
- Another field campaign is planned at the NIST test house in Gaithersburg, MD with Delphine Farmer, Marina Vance and Dustin Poppendieck

Final Comments:

- Indoors chemicals settle on surfaces, react, and then go back into the air.
- What should we do until the vaccine arrives? Taking one action is insufficient e.g. wearing a mask or buying an air cleaner; we need to use a multi-layered approach and stay with.
- Vigilance
- Thanked Sloan Advisory Committees for the Microbiology of the Built Environment and Chemistry of Indoor Environments programs as well as PI's, graduate students and post docs.

Resources:

https://indoorchem.org/projects/homechem/

Kevin Van Den Wymelenberg, University of Oregon
https://archenvironment.uoregon.edu/architecture/kevin-van-den-wymelenberg

Link to Kevin's video https://www.youtube.com/watch?v=k1O4oiNoUrU

Link to Jon Abbatt's paper https://www.pnas.org/content/116/24/11658

Link to paper by Grassian and colleagues about why hydrophobic molecules stick to glass
https://pubs.rsc.org/en/content/articlelanding/2019/sc/c8sc05560b#!divAbstract which was profiled https://www.rsc.org/news-events/journals-highlights/2019/jan/whats-sticking-on-my-glass/

Link to Beating the Surge with Control of Airborne Exposure, by Karen Cohn, MS, CIH
https://drive.google.com/file/d/1sao_SOF3p6_QkPQHBZxXUfNgOijYUWdW/view

Z-Man signing off

Trivia question

Name the philanthropic foundation which "believes that that a carefully reasoned and systematic understanding of the forces of nature and society, when applied inventively and wisely, can lead to a better world for all."

Answer:
Alfred P. Sloan, foundation

Correctly Answered by: Vic Cafaro, Richmond, VA