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12:20 – 1:10 p.m.
https://uncsph.zoom.us/j/94134931564

Chemical safety involves both biology (what the chemical does to us) and behavior (what we do to encounter that chemical). Fully understanding either of those is beyond current scientific methods. Despite the inherent complexity certain features emerge that can provide helpful rules for understanding and predicting what might happen. For example, due to patterns that arise in the entertainment industry, there was a 1990’s party game in which players could connect any actor or actress by shared movie roles to actor Kevin Bacon – often using just two or three movies. Depending on what data are available regulators make use of human, animal, in vitro, and even chemical structure-based predictions to make decisions about the impact of chemical use on both health and the environment. Making predictions with limited data is tricky business. Predictive modeler Nate Silver advises when we forecast what we think will happen that we be open to a range of possibilities—some things are more likely than others, to be sure, but by considering the full range of possibilities we better prepare for what actually may occur. In this seminar several approaches for making predictions will be discussed, including mathematical modeling, applied statistics, and machine learning. Ultimately it is far easier to make a prediction than it is to understand the confidence in that prediction. It is our job not to fool ourselves – our health depends on it. This abstract may not reflect U.S. EPA policy.

Learning objectives:
1. What are the three elements that the National Academies of Sciences, Engineering, and Math recommend be considered when assessing of risk posed to the public health and the environment by a chemical?
2. How does the U.S. government determine the sort of experiments that are appropriate to determine chemical risk to the public and the environment? (for example, when should we do a human clinical trial?)
3. What is a consensus model?