The US Environmental Protection Agency (EPA) has estimated that the lifetime risk of dying from leukemia as a result of continuous inhalation exposure to 1 part per million of formaldehyde in air could be as high as 6%, about 4 times higher than the US background leukemia risk. Similarly, for nasopharyngeal cancer, EPA's lifetime risk estimate is about 1%, over 150 times higher than the corresponding US background risk. Have you ever wondered how such estimates are generated and whether or not they are credible? Might they be purposely exaggerated to “err on the side of safety”? In this seminar, we will take a look at quantitative cancer risk assessment, the process that generates such risk estimates, using formaldehyde for illustrative examples. We’ll identify the four basic steps of risk assessment, and we’ll consider how laboratory animal and human cancer data are used to fit quantitative dose-response models that are useful in extrapolating potential risks to different exposure conditions. We’ll also explore how new mechanistic animal data can be utilized in a novel “bottom-up” approach to improve risk extrapolations for at least some chemicals.

The learning objectives for this seminar are to:

- Gain an understanding of the 4 principal steps in the quantitative risk assessment process
- Learn about important features of the experimental and observational data and quantitative dose-response models that are used in developing human lifetime cancer risk estimates
- Learn about a novel “bottom up” approach that makes use of new mechanistic animal data to reduce some of the large uncertainties that are inherent in risk extrapolations for some chemicals