

Characterization of Bioaerosols from Non-Point Sources

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While the pollution of our atmosphere continues to receive increased attention, the microbiological quality of both indoor and outdoor air (generically termed “bioaerosols”) has been largely ignored by the engineering community. Certainly, this is not consistent with the public health charter given to civil and environmental engineers regarding water quality. Industrial hygienists have traditionally answered the challenge to characterize airborne microorganism exposures; however, they often use limited culture-based approaches, and have not addressed the scientific issues required to support modern exposure assessments.

This presentation will introduce technical considerations for bioaerosol sampling with the adaptation of microscopy and molecular methods to determine the identity, abundance and activity of airborne microbes and other atmospheric biopolymers. The presentation will include a synopsis of recent research where molecular probes were leveraged for the express purpose of forensic source tracking. This overview will include case studies of pathogenic bioaerosols partitioning from contaminated water sources into very different environments: an indoor hospital therapy pool, and the quarantined New Orleans flood zone in the weeks between hurricanes Katrina and Rita (September, 2005). The challenges of extending modern bioaerosol characterization technology to outdoor environments will be addressed.