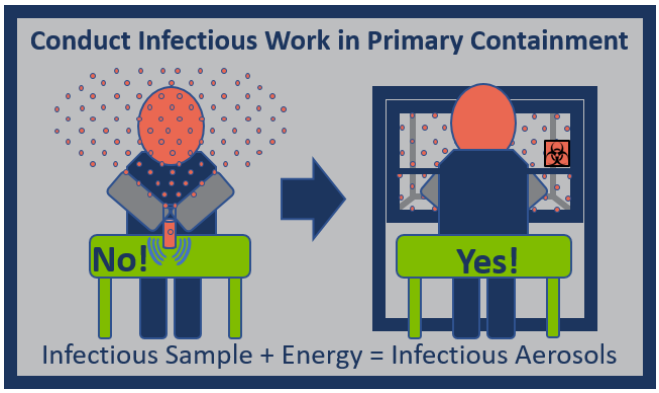
2019 Featured Topic: Infectious Aerosols

Creation of Infectious Aerosols



Biological risk assessments consider both the inherent hazardous properties of an agent and the procedures and people involved in working with it. Natural transmission routes of an agent are informative, but alternative ways of exposure are also likely in the laboratory setting. For example, one might expect contaminated needlesticks or sharps injuries easily transmitting mosquito-borne viruses, but many of these viruses also have infected laboratory personnel after samples were inadvertently aerosolized.

Proficiency, diligence, and the attitude of the individuals conducting the work are also factors that determine the likelihood and routes of exposures in the laboratory. Inadequate handwashing or glove-changing practices can quickly disseminate infectious agents to multiple surfaces. Similarly, sloppy or rushed sample processing techniques can exacerbate infectious aerosol production.

Infectious aerosols are particularly relevant in the research setting since most laboratory-associated infections (LAIs) occur by aerosol-based transmission. Any procedure imparting energy to a sample can create aerosols. The small size of infectious particles and a lack of awareness about activities that can develop aerosols, often increase the likelihood of an LAI. Activities that create aerosols include pipetting, vortexing, sonicating, and centrifuging samples. Because of their smaller volume, aerosols have a reduced infectious load capacity per particle, but these particles are efficiently disseminated and pose an infection risk to anyone in the vicinity. In contrast, droplets are larger and quickly settle from the air, but they also may contain higher loads of infectious agents that can be easily transferred to other laboratory surfaces, increasing the risk of mucous membrane or ingestion-based exposures.