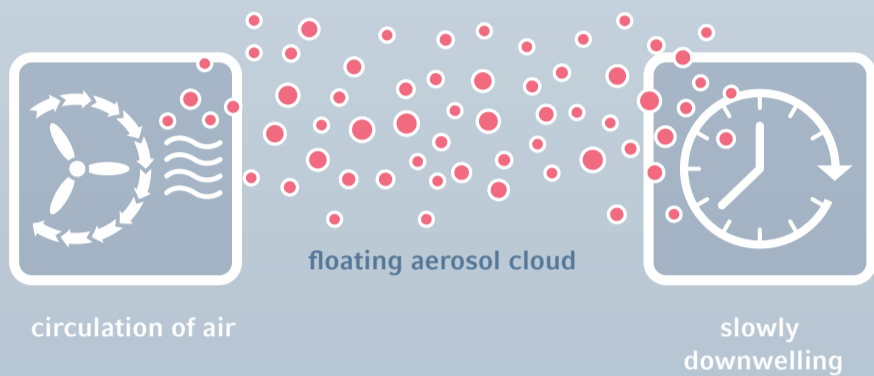


Stay Informed

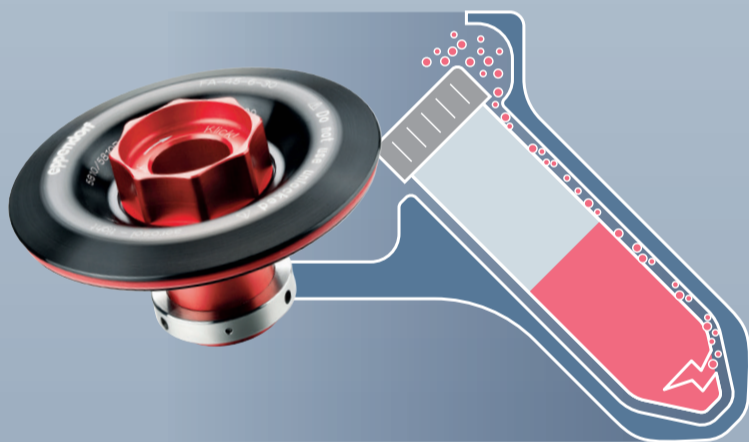
Aerosols in the Lab

Aerosols are colloidal systems of droplets and/or solid particles suspended in air. Aerosols can be found almost everywhere in the world and we inhale them continuously, so we should differentiate between harmful and harmless aerosols. The most important aerosols in the laboratory environment are bio-aerosols.



1 Introducing aerosols

Bio-aerosols can contain infectious agents such as bacteria, viruses, and fungi as well as endotoxins or mycotoxins. Owing to their small size (<math>< 10 \mu\text{m}</math>), they can remain suspended in the air for several hours and be widely dispersed by air currents. If inhaled, they can cause severe infections (remember Legionnaires' disease!).



3 Sources and means of distribution

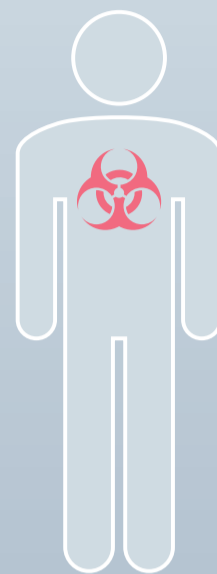
Aerosolization takes place through breathing, speech, coughing, and sneezing. Common laboratory activities such as centrifugation, pipetting, opening of ampoules, and shaking can also cause aerosols.

4 Preventive measures

The first step in protecting laboratory personnel is understanding aerosols and how they are generated. Everyone in the lab should be aware of the risks of working with infectious agents. The following precautions help prevent health hazards:



- 1 Use aerosol-tight caps/lids during centrifugation.
- 2 Consider the min./max. filling volume of vessels.
- 3 Don't exceed the vessel's speed limit.
- 4 Use plastic vessels – glass vessels are more likely to break or leak.
- 5 Alternatively, open and load/unload the rotor in a biosafety cabinet.
- 6 If a tube breaks or leaks, wait 30 minutes before opening the centrifuge or aerosol-tight lid or cap to let the aerosols settle.



24 fatalities



1141 laboratory acquired infections*



2 Consequences

There are many documented cases of laboratory-acquired infections resulting from the inhalation of infectious aerosols. These infections may be more or less severe, depending on the agents, and present a health hazard for everyone in the lab.

(*1979–2005: Harding, L.H. and K.B. Byers. 2006. Epidemiology of laboratory-acquired infections.)

