

**Call for a bachelor-/project-/study thesis on the topic:
"Characterization of the filtration performance of respiratory masks after their sterilization"**

In English or German speech

Scope of the work:

Despite tight restrictions and preventive hygiene policies, SARS COV19 continues spreading pandemically. Thereby, the rapid spreading kinetic of the virus is due to its enormous transmission rate, whereby the decisive human-to-human transmission occurs predominantly through two transmission pathways: transmission by droplets and transmission by airborne particles/dried droplets (see Figure). The latter transmission mechanism is of particular relevance, as it cannot be significantly prevented even by wearing self-made or surgical masks, as they may not protect against small submicron particles. In contrast, FFP2 masks are powerful filtration devices, as they can effectively separate out even the smallest particles ensuring a complete self-protection. Unfortunately, in recent past, hospitals have been reusing FFP2 masks after their sterilization – however, without knowing in which way the filtration performance of these masks may be affected by sterilization processes.

For this reason, we will subject various mask types to several sterilization methods and we want to examine, whether and to what extent the filtration performance degrades in respect to a) droplets and b) airborne particles. Thereby, particular focus will be on the characterization of FFP 2 masks. In order to test the separation efficiency of the masks against particles of both transmission pathways, a test stand was already set up at the PVT. By using test aerosols, the separation efficiencies as function of the particle sizes can be obtained for all mask types.

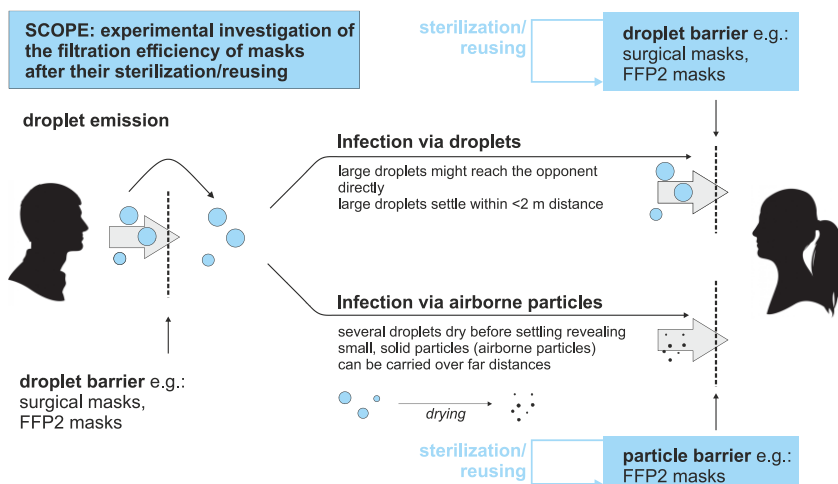


Figure:
illustration of air conducted viral transmission pathways

Although the test setup already exists, we are looking for a student who is very structured and well organized to provide a secure experimental procedure in the laboratory. First, you will obtain an insightful introduction into several measurement techniques in the scientific field of aerosols. Subsequently, you will determine the separation efficiency for multiple masks by your own and we will interpret the obtained data together. Due to the current high relevance of this topic to the public health, the work has to start as soon as possible.

Best regards, R. Tischendorf