

Institute of Aerospace Medicine

Institute Seminar, November 13, 2018, *Abstract*

PD Dr. Gregor Grass

Bundeswehr Institute of Microbiology, Munich, Germany.

Anthrax – detection, diagnosis and bioforensics

The Bundeswehr Institute of Microbiology (IMB) is a governmental research institution for medical biodefense within the portfolio of the Federal Ministry of Defense. Its key responsibility is to provide up-to-date scientific knowledge and technology in research, training, evaluations and diagnostics in its field of competence. The institute is also responsible for medical reconnaissance and verification of biological attacks. The IMB advises the Federal Ministry of Defense on all scientific issues related to medical biodefense as well as the control and disarmament of biological weapons. IMB's Central Diagnostic Unit offers a large spectrum of diagnostic parameters for the diagnosis of infectious diseases caused by highly pathogenic agents in a DIN EN ISO 15189 accredited environment. One of the institute's major focuses is bioforensics, which means a bundle of procedures and methods to identify the source of a deliberate outbreak and to attribute it to the perpetrator. To this end the IMB operates a dedicated genomics and bioinformatics core unit that supports the research groups instrumentally and with data analysis.

Research in the IMB "anthrax" group focuses on molecular typing (including genomics) of the etiological pathogen *Bacillus anthracis*, the design and validation of in-house diagnostic assays for the bacterium and the development of a tool-box utilizing specific bacteriophages and their proteins for identification of *B. anthracis* in various matrices. Recent research highlights comprise cooperative projects to characterize the microevolution of *B. anthracis* at animal burial sites in Italy or the retrieval of *Bacillus* strains from heroin to characterize heroin associated anthrax strains. The group is currently working on a project concerned with the degeneration of virulence factors of *B. anthracis* in endemic areas. Finally, a novel, combined digital-PCR(dPCR)/Fluorescence-in-situ-hybridization (FiSH) method is being developed for the sensitive detection of *B. anthracis* by microscopy and dPCR.

Dr. Grass is a tenured senior researcher at the Bundeswehr Institute of Microbiology and has worked as a microbiologist for 21 years. He is heading the anthrax group at the IMB since 2011.