INNOVATING CROSS-DOMAIN SOLUTIONS TO DETECT EMERGING BIOLOGICAL THREATS

Nato Technical Activity: Sequencing For Environmental Aerosol Background Monitoring

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Biological threats, including naturally occurring and modified pathogens, pose a challenge to NATO operations as deployed forces may encounter endemic diseases, imported diseases, or even biological agents that are intentionally released by hostile actors. In addition, climate change is expected to accelerate the emergence or spread of zoonotic diseases, including those with pandemic potential. Reliable and relatively fast methods for detection of harmful biological microorganisms in complex matrices are becoming more readily available through commercial, university/academic, and science and technology (S&T) defense activities. Sequencing can be used to identify any biological threat, but first, the composition of the natural background needs to be established. Biological aerosol backgrounds will vary based on location, season, time of day and meteorological conditions. To this end, NATO has established a Research Task Group (RTG) to bring together sequencing and aerosol experts in the defense community to address challenges associated with environmental aerosol monitoring using sequencing-based approaches. The RTG seeks to broadly characterize natural backgrounds by leveraging/strategizing the NATO nation activities in this area of research. We will focus on exploring and recommending best practices for sampling and collection methods; sample preparation; sequencing technology; data analysis and interpretation of complex samples; recommendation on metrics and thresholds for improved user-confidence; and database requirements and management. This presentation will summarize the RTG technical activity; key technical questions and issues to be addressed by the RTG; individual NATO participant activities and approaches to sequencing environmental backgrounds; and future ideas, concepts, and plans for the RTG effort.

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