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Nicholas Bergman
National Bioforensic Analysis Center, USA

Genomics-based bioforensic analysis at the national bioforensic analysis center

The identification and characterization of emerging, engineered or even synthetic biological agents is extremely challenging and requires an analytical process that is flexible, agent-agnostic and capable of high resolution. Here we present a genomics-based approach to bioforensic analysis that allows for isolate-level identification of any biological agent, characterization of any sample regardless of complexity and inferential analysis of DNA sequences to assess both phylogeny and function. This approach includes sample extraction and next-generation sequencing at BSL-2, BSL-3 and BSL-4 as well as bioinformatic analysis using a suite of custom tools and pipelines designed for bioforensics. Several example analyses will be discussed to demonstrate how genomics is applied to different types of bioforensic problems and to highlight its value in high resolution genotyping, metagenomic analysis, viral discovery and other applications.

Biography

Nicholas Bergman has completed his PhD at MIT and Postdoctoral training at the University of Michigan Medical School and The Institute for Genomic Research (TIGR). He is currently the Head of the Genomics Department at NBFAC. He has published more than 45 papers in reputed journals and serves on numerous Advisory and Editorial Boards.

nicholas.bergman@nbacc.dhs.gov