University of Basel
Department of Biomedical Engineering

Seminar Series:
Latest Breakthroughs in Biomedical Engineering Research

Location: DBE Science Lounge, Hegenheimermattweg 167C, 4123 Allschwil
Date & Time: Thursday 10.04.2025 | 16:30 – 17:30
Host: Dr. Iris Schulz

Evaluation of DNA methylation sites neighboring STRs and iSNPs for potential body fluid determination and contributor assignment

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Abstract

The lecture introduces the analysis of short tandem repeats (STR) and identity single nucleotide polymorphisms (iSNP) for person identification in combination with DNA methylation for body fluid determination. Forensic casework often involves analysis of mixtures containing DNA of several individuals possibly from different body fluids or tissues. When analyzing mixtures, a highly relevant question is the assignment between sample contributors and corresponding body fluid. We used massive parallel sequencing (MPS) to investigate whether STRs/iSNPs and neighboring DNA methylation sites can be simultaneously analyzed. The analysis of forensic relevant body fluids revealed differentially methylated loci near STRs and iSNPs. The set of combined individual and tissue-specific positions form the basis for linking sample contributor and biological source type in mixtures.

Biosketch

Laura Schmelzer completed her master's degree in Biomedicine Science in Marburg (Germany). Since 2022, she is doctoral student at the Institute of Forensic Medicine Freiburg in the group of PD Dr. Jana Naue. In PD Dr. Jana Naue's research group on forensic epigenetics, Laura Schmelzer is working on new approaches for the determination of body fluids and person assignment in mixed traces. To date, she has been involved in collaborative projects with scientists from South Korea and the Netherlands, presented research results at international conferences and won the Peter Schneider Young Scientist award for the best oral presentation at Spurenworkshop conference in 2024.