Development of a forensic biosensor for fingermark profiling

Background – Fingermarks are among the most important types of physical evidence that can be encountered at the crime scene, since their characteristic ridge pattern can be used for identification. Fingermarks are composed of materials derived from sweat excreted via the pores present in the skin, but can also contain contaminants originating from the environment. Thus, when depositing a fingermark, each individual will also leave a unique chemical profile that can be used to create a donor profile, furthermore, it can also link the donor to certain activities, such as drug usage and handling of explosives. Importantly, in case of a poor quality fingermark or when no reference fingerprint is present in the fingerprint database, this additional chemical information might give clues about the donor (e.g. sex, blood type, diet and drug usage) and can be used to support the evidence (e.g. time of deposition).

Goal – To develop a biosensor that is able to determine the sex of the donor of the fingermark.

Approach: Sex specific biomarkers will be selected based on literature, followed by the selection of antibodies to target the biomarkers. Additionally, the antibodies will be used for the functionalization of a forensic biosensor that, in the end, can be applied directly at the crime scene to reveal important information.

Requirements/ Skills– Interest in bio(medical), bio(chemistry) or bio(physics) or other related fields

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