Practical application of fluorescent dyes in forensic science

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The research aims to improve various areas of analysis of dactyloscopic and DNA evidence by introducing innovative physicochemical methods based on the fluorescence phenomenon, while preserving the evidentiary function of the material examined, verifying existing procedures, and maintaining the reliability of the evidence in a procedural sense. Any method used in forensic science and admitted as evidence in court must have a diagnostic value that is known and described in the professional and recognized literature on the subject, as we are talking about scientific evidence. Empirical studies will allow the description and evaluation of the photophysical and structural properties of luminescent materials. Luminescent probes such as DFO, Diamond™ Nucleic Acid Dye, SYBR® Green I Nucleic Acid, and Acridine Orange will allow the development of applications in forensic science. Research into spectroscopic techniques, such as the analysis of absorption, emission spectra, or fluorescence lifetimes, enables the development of a method or the improvement of an existing method for the examination of evidence. Ongoing research has resulted in a new method for the visualization of dactyloscopic traces and the proposal of a method combining two currently used methods - 2-in-1 analysis.

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