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# Luminescence-based detection of analytes of clinical and environmental relevance

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Light serves as a potent tool for various applications, including (i) generating bright contrast agents for in vivo imaging, (ii) facilitating real-time and spatial measurements of biological analytes, (iii) exploring therapeutic avenues, and (iv) achieving high analytical performance in vitro diagnostics. Luminescence-based techniques, encompassing photo-, chemi-, electrochemi-, and thermochemi-luminescence, offer high sensitivity and versatility to cater to diverse analytical needs, especially in in vitro

diagnostics. This presentation highlights two applications demonstrating the versatility of luminescence-based techniques. Firstly, it addresses the imperative for developing an accurate, rapid, cost-effective, and portable platform for detecting infectious agents, emphasized by recent pandemics. Secondly, it explores the design of derivatized natural polymers to detect micro- and nano-plastics, which pose a significant global challenge yet lack adequate analytical solutions.