



# Aggregation-induced emission with white, green, or blue luminescence from biologically-active indole derivatives

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## Abstract:

Among several advantages of single-chromophore white-light-emitting dyes over mixed dyes are their phase stability and fabrication low-cost. Also, materials with aggregation-induced emission (AIE) have been employed as good bioprobes for DNA and for detecting some biomacromolecules sensitively and selectively. To be suitable for biological applications, the molecule should have AIE properties and be biocompatible. Indoles are electron-rich unsaturated compounds that display photophysical properties with potential applications such as fluorescent probes in addition to their widespread biological activities. Materials characterized with white-color emission, AIE activity, and biocompatibility are presented in this work. The thermal behavior and photophysical properties of some indole derivatives have been studied experimentally and theoretically using density functional theory. Besides their reported biological activities, the studied indole dyes show high thermal stabilities and AIE behavior. Some dyes gave white-color luminescence from a single chromophore, while others produced blue or green emissions. Theoretical and experimental results indicate that the different emission behavior of these dyes resulted from forming various kinds of aggregates with different intermolecular interactions.

## Keywords:

Indole White-color luminescence Aggregation-induced emission Density functional theory calculations

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