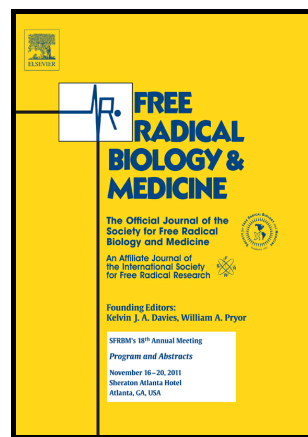


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## Fluorescence and chemiluminescence approaches for peroxynitrite detection

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### Abstract

In the last two decades, there has been a significant advance in understanding the biochemistry of peroxynitrite, an endogenously-produced oxidant and nucleophile. Its relevance as a mediator in several pathologic states and the aging process together with its transient character and low steady-state concentration, motivated the development of a variety of techniques for its unambiguous detection and estimation. Among these, fluorescence and chemiluminescence approaches have represented important tools with enhanced sensitivity but usual limited specificity. In this review, we analyze selected examples of molecular probes that permit the detection of peroxynitrite by fluorescence and chemiluminescence, disclosing their mechanism of reaction with either peroxynitrite or peroxynitrite-derived radicals. Indeed, probes have been divided into 1) redox probes that yield products by a free radical mechanism, and 2) electrophilic probes that evolve to products secondary to the nucleophilic attack by peroxynitrite. Overall, boronate-based compounds are emerging as preferred probes for the sensitive and specific detection and quantitation. Moreover, novel strategies involving genetically-modified fluorescent proteins with the incorporation of unnatural amino acids have been recently described as peroxynitrite sensors. This review analyzes the most commonly used fluorescence and chemiluminescence approaches for peroxynitrite detection and provides some guidelines for appropriate experimental

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<sup>1</sup> Both authors equally contributed to this review.

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