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Editorial

Quality Assurance in Fluorometry

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Bioanalysis, e.g., molecular genetics and immunosensing as used in medical diagnostics and drug screening as well as histochemistry are booming fields for research and development where advances are taking place on all fronts. In these areas as well as in material sciences and environmental analysis, luminescence techniques are widely used as analytical tools and detection methods due to their high sensitivity, intrinsic selectivity, potential for multiplexing applications, non- or minimally invasive character, comparative ease of use, and remote accessibility of signals. However, independent of fluorescence technique and particular instrumentation, the contribution of instrument-specific effects to the measured signals and the sensitivity of the spectroscopic properties of most chromophores to their microenvironment hamper the comparability of fluorescence data as well as quantification. This situation renders quality assurance in fluorometry, very important especially with consideration of the often black box-type use of fluorescence instruments and software for data analysis as well as future applications of fluorescence techniques in strongly regulated areas like medical diagnostics and clinical chemistry. Accordingly, there is an ever increasing need for guidelines for the characterization and performance validation of fluorescence instrumentation as well as performance of typical fluorescence measurements and eventually standardization. This simultaneously requires suited and easy-to-operate standards. First steps into this direction have been only recently taken by the IUPAC Task Force Group *Reference Methods, Standards and Applications of Photoluminescence* founded in 2004 and the subcommittee *Molecular Spectroscopy* of ASTM International.

In this issue of the *Journal of Fluorescence*, we have assembled articles that give an overview of fluorescence-inherent sources of error, the current state of quality assurance, and available standards for a broad variety of fluorescence techniques ranging from steady state macro- and micro-fluorometry over time-resolved fluorescence spectroscopy to flow cytometry, fluorescence correlation spectroscopy, fluorescence microscopy, and fluorescence-based microarray technology. I would like to thank the authors for their cooperation and diligence in summarizing their investigations that advance our understanding of fluorescence measurements and their limitations as well as means to overcome them. Finally, I would like to thank the Editor of the *Journal of Fluorescence*, Dr. Chris D. Geddes, for his valuable assistance in the preparation of this special issue.

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