From luminescent molecular probes to cellular stains

Abstract

Fluorescence spectroscopy, allowing the visualization of molecular events with extraordinary sensitivity and selectivity, has transformed the study of biological systems. Part of the increasing success of luminescent techniques derives from the development of new sensors with improved photophysical properties and increased sensitivity and selectivity. In this context, in addition to the development of new organic fluorophores, there is an increasing interest in the application of lanthanide ions as emissive species in luminescent biosensors. We will present examples of intermolecular energy transfer processes and peptide conformational changes applied to the development of luminescent lanthanide-based metallopeptide sensors targeting protein,1,2 or RNA.3 We will also present the development of new DNA probes based on simple bisamidine units, and their use as effective platforms for delivering selected cargoes to particular DNA sequences.4 We will finally show the unique properties of a simple bisamidine that can be used as a cellular stain for selective labeling of mitochondria and relevant mitochondrial degradation processes.

References