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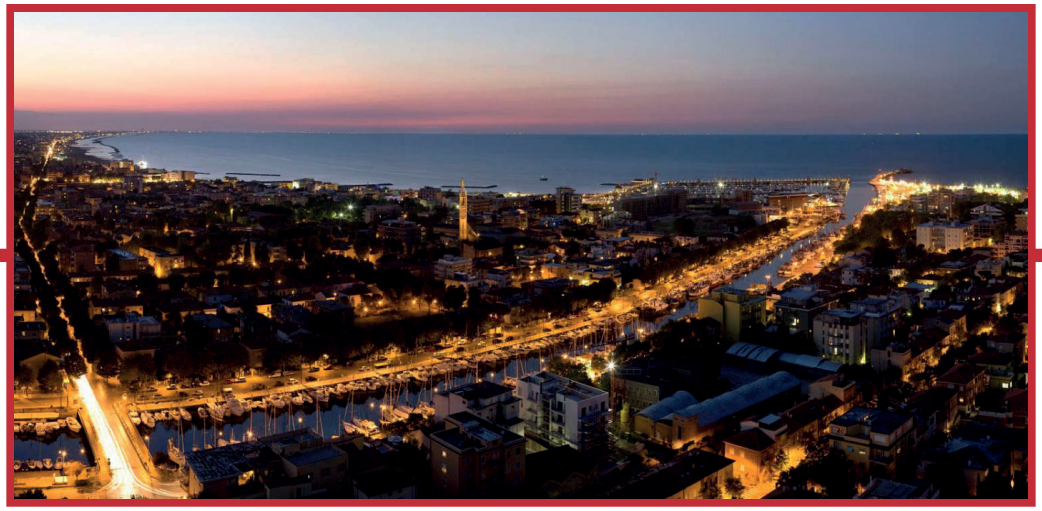
Young Chemists' Symposium 2019



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Fluorescent naphthalimide-imidazolium hydrogels for biomedical applications

Carla Rizzo,[a] Patrizia Cancemi,[b] Salvatore Marullo,[a] Renato Noto,[a] and Francesca D'Anna[a]

[a] *Dipartimento STEBICEF, Sezione di Chimica, Università degli Studi di Palermo, Viale delle Scienze Ed. 17, 90128-Palermo, Italy.*
[b] *Dipartimento STEBICEF, Sezione di Biologia Cellulare, Università degli Studi di Palermo, Viale delle Scienze Ed. 17, 90128-Palermo, Italy.*
E-mail: carla.rizzo03@unipa.it

Bioimaging and in vivo imaging are cornerstone technologies in support of biomedical diagnosis. However, in some cases imaging methods have increased cancer risks for patients. Moreover, the most widely used diagnostic medical imaging technique, X-ray imaging, is the largest man-made source of radiation exposure to the general population. Thus, the research of new efficient and less invasive materials for imaging is quite urgent.

Supramolecular hydrogels have recently proved to be promising biological carriers to load versatile bioimaging agents for in vitro or in vivo bioimaging, thanks to the ability to undergo reversible swelling and gel–sol transition in response to various physiological stimuli. In addition, the biodegradability and biocompatibility allowed the use of supramolecular gels also for cancer diagnosis, as they can be facilely endocytosed into cells [1].

Remembering the good biological response of some imidazolium derived hydrogels [2], fluorescent imidazolium organic salts, that should own the double function of gelator and bioimaging agent, have been synthesized.

New fluorescent hydrogels with interesting physico-chemical properties (rheology, gel-sol temperature transition and optical properties) have been tested for anti-proliferative activity, in vitro bioimaging on cancer cells and controlled release of gelator in physiological medium. Results evidence how these hydrogels can be potentially investigated as new theranostic media for anticancer research.

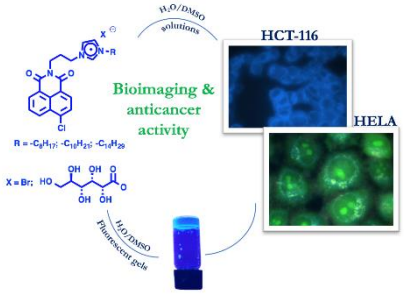

Figure 1: Gelator structure and bioimaging on cancer cells.

[1] R. Dong, Y. Pang, Y. Su, and X. Zhu, *Biomater. Sci.* **3** (2015) 937-954.
[2] C. Rizzo, R. Arrigo, N. Tz. Dintcheva, G. Gallo, F. Giannici, R. Noto, A. Sutera, P. Vitale, and F. D'Anna, *Chem. Eur J.* **23** (2017) 16297-16311.

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