SEMINAR

Novel correlative microscopy tools to study biology and biomaterials at the nanoscale

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Kyoto University KUIAS (iCeMS Main Building)
2F Seminar Room (#A207)

Correlative microscopy is a powerful approach that combines the capabilities of individual microscopy techniques, typically with the aim of obtaining high chemical specificity and detailed structural information of the same sample area. In this talk, I will present our most recent progress in developing novel tools for different modalities of correlative imaging. The first part will deal with the implementation of a novel correlative microscope that allows sequential imaging of the same sample area by atomic force microscopy (AFM) and super-resolution fluorescence microscopy [1]. I will discuss the technical aspects of the correlative microscope, its application to validate and scrutinize super-resolution methods, and its use to characterize hybrid bionanomaterials [2]. In the second part of the talk, the screening and characterization of fluorescent proteins as genetically-encoded tags for correlative light and electron microscopy (CLEM) will be presented [3,4]. These fluorescent proteins produce reactive oxygen species upon irradiation, which locally photooxidize diaminobenzidine to form an osmiophilic precipitate that gives contrast in EM. Both correlative imaging modalities have the power to answer new biological questions at the nanoscale.

References [1] Monserrate, A.; Casado, S.; Flors, C, *ChemPhysChem* **2014**, 15, 647.
[2] Bondia, P; Jurado, R.; Casado, S.; Domínguez-Vera, J. M.; Gálvez, N.; Flors, C, *Small* **2017**, 13, 1603784.
[3] Ruiz-González, R.; Cortajarena, A. L.; Mejias, S. H.; Agut, M.; Nonell, S.; Flors, C, *J. Am. Chem. Soc*. **2013**, 135, 9564.
[4] Rodríguez-Pulido, A.; Cortajarena, A. L.; Torra, J.; Ruiz-González, R.; Nonell, S.; Flors, C., *Chem. Commun*. **2016**, 52, 8405.

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