INPhINIT
"la Caixa" Fellowship Programme

Many people form part of history.
Only a few manage to change it.

IBEC
Institute for Bioengineering of Catalonia

EXCELENCIA SEVERO OCHOA

IBEC participates in "la Caixa" Fellowship Programme with a set of stimulating PhD projects and excellent research groups to host the fellows

Nanoscopy for nanomedicine group

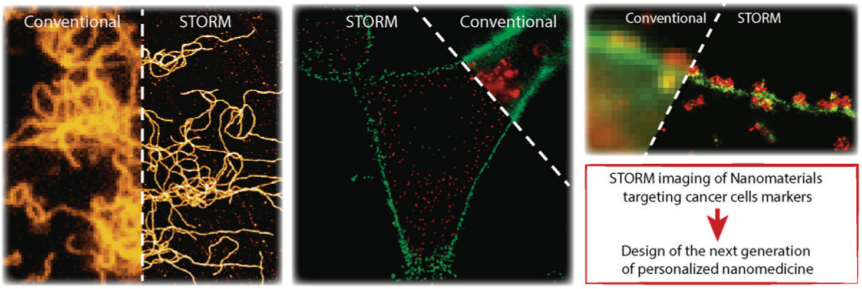
Group leader: Lorenzo Albertazzi

Self-assembled materials for personalized nanomedicine

The Nanoscopy for Nanomedicine group focus on two main goals: i) the synthesis of novel drug nanocarriers based on self-assembly, i.e. able to build themselves through self-organization (see ACS Nano, 2016, 10 (2), 1845–1852); ii) the use of an innovative imaging technique such as super resolution microscopy to visualize nanomaterials in vitro and in the cellular environment (see Science, 2014, 344(6183): 491-5 and ACS Appl. Mater. Interfaces, 2016, 8 (10), 6391–6399). The use of nanomaterials for the selective delivery of drugs for cancer therapy is a main application of nanotechnology. However clinical success in cancer therapy is often limited due to the biological variability between the cancer of different patients, making challenging to develop an effective treatment.

One of the frontiers of cancer therapy is therefore personalized medicine, i.e. the design of therapies tailored for individuals. In this project the student will develop nanomaterials for personalized medicine, able to target specific marker combinations associated with a single cancer case.

Thanks to the unique features of self-assembled materials it will be possible to prepare a library of compounds from which specific nanocarriers for single patients can be formulated. In this framework the use of advance imaging techniques such as STORM microscopy to visualize the nanomaterials interacting with cancer cells will guide the design of new and efficient nanocarrier with the potential to alter the landscape of current cancer therapies.



Job position description

The student will be involved in:
1) The synthesis of nanoparticles and nanofibers with functional ligands for cancer recognition;

2) Learning the use of super resolution microscopy and use STORM for tracking of nanomaterials in cancer cells;
3) The formulations of targeted materials for personalized medicine;

4) The biological evaluation of the material efficacy for prostate cancer therapy. The project is in the framework of several European consortia and collaborations and visiting period abroad are envisioned.

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