

Daniel Rodríguez Ajamil

ESR 13

Institution: Tel Aviv University

Group: Cancer Research and Nanomedicine

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Mid-Term Check Meeting
Edinburgh, 5th June 2019



UAB
Universitat Autònoma
de Barcelona

BSc in **Nanoscience and Nanotechnology** (mention in Biotechnology) 4 years



Vall d'Hebron
Institut de Recerca

MSc in **Translational Biomedical Research**. 1 year



ICN2^R
Institut Català
de Nanociència
i Nanotecnologia

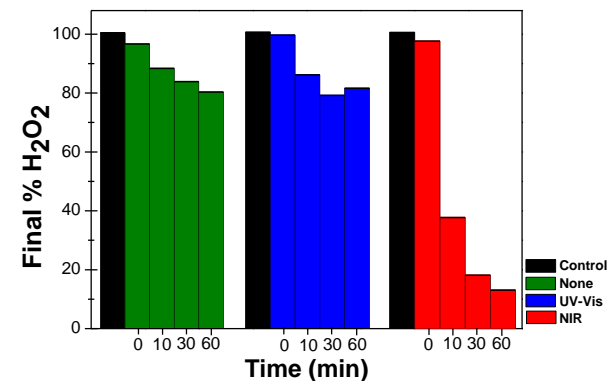
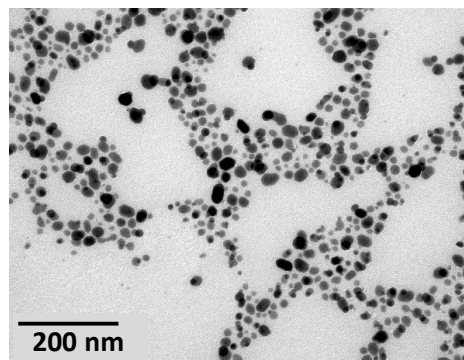
Training stay. 2 month: **TEM, SEM and Inorganic Nanoparticles Synthesis**



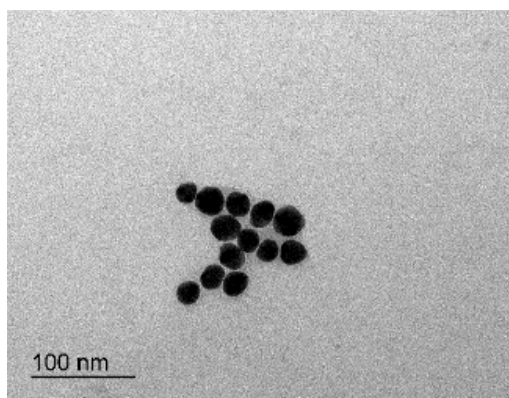
Inorganic NPs in Medicine

- Synthesis and Characterization: Ag_2S , Au, Fe_3O_4 , CeO_2 ... NPs
- Protein and Antibody Corona
- Catalysis
- Magnetism

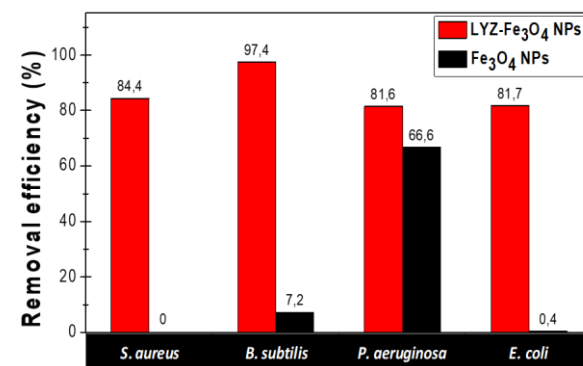
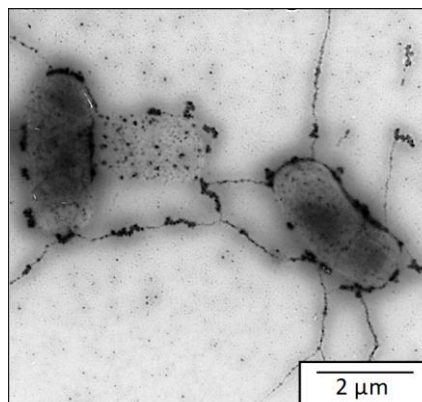
Ag_2S NPs: ROS scavenging and Imaging in the NIR



Au NPs: Protein Corona



Lyz- Fe_3O_4 NPs: Bacteria Capture



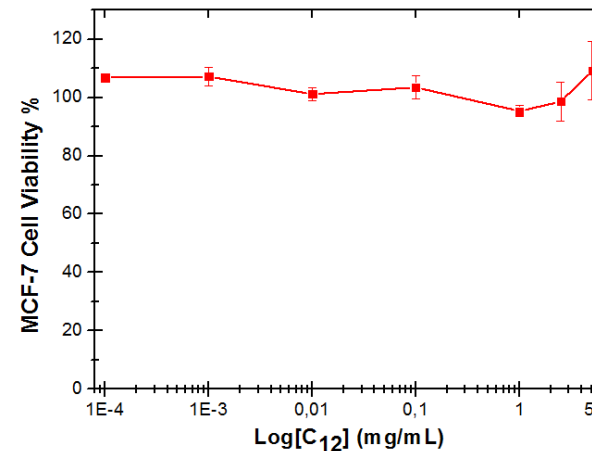
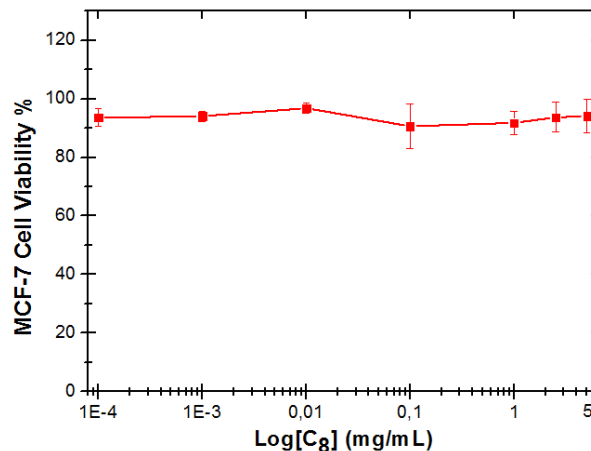
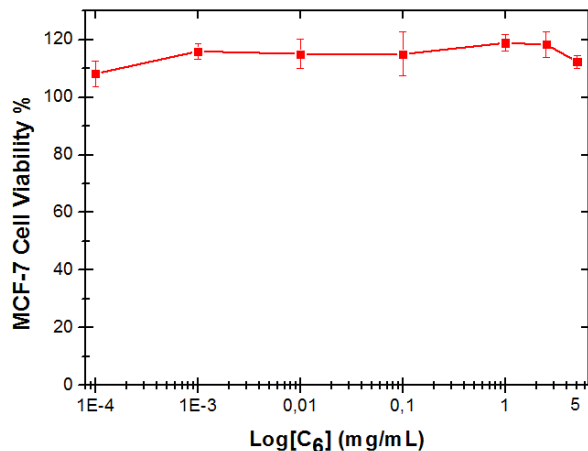
Objectives

- Establish mCherry-labeled orthotopic models of cancer in mice;
- Evaluation of biodistribution of the newly- synthesized pro-dyes
- Evaluation of anticancer activity of the activated prodrugs

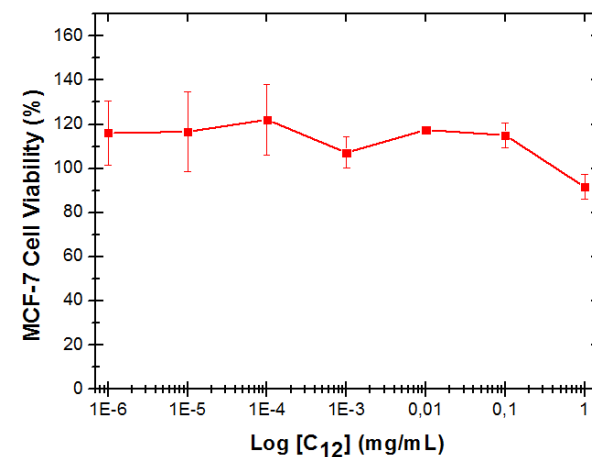
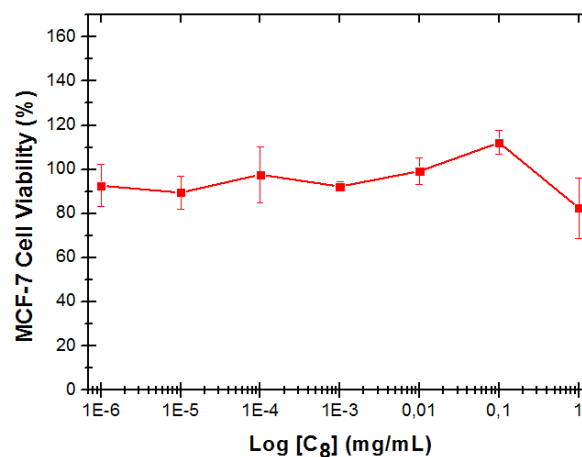
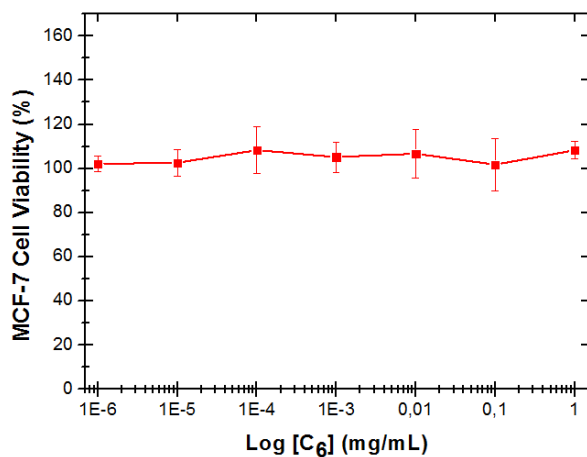
Foreseen research

- Biologic Characterization of amphiphilic PEG-dendron hybrids synthesized by Roey Amir's group. Red Blood Cells (RBC) lysis studies and toxicity evaluation
- The Biocompatible carriers will entrap a combination of drugs, e.g. PARPi, MEKi inhibitors. We will determine their combination index by viability assays
- Full *in vitro* evaluation in 3D culture: internalization and drug release
- *In vivo*: maximum tolerated dose (MTD), pharmacokinetic (PK) and pharmacodynamic (PD) analysis, anticancer efficacy and toxicity on orthotopic models of cancer in mice

MTT with MCF-7 cells

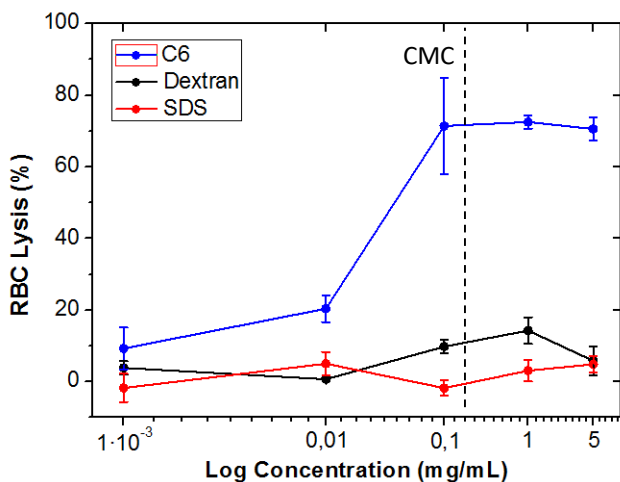


Proliferation test with MCF-7 cells

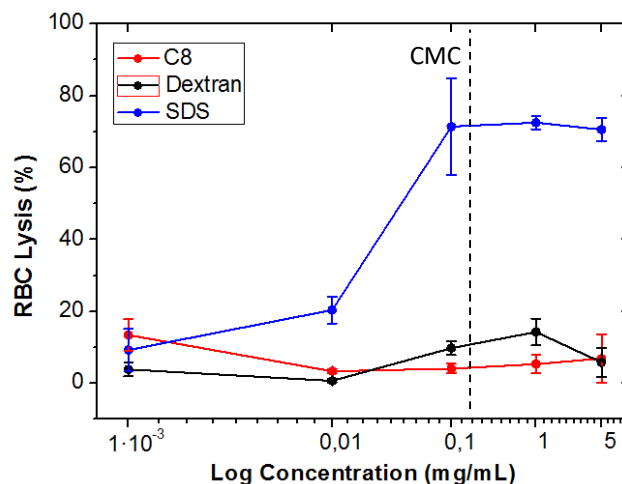


RBC Lysis test

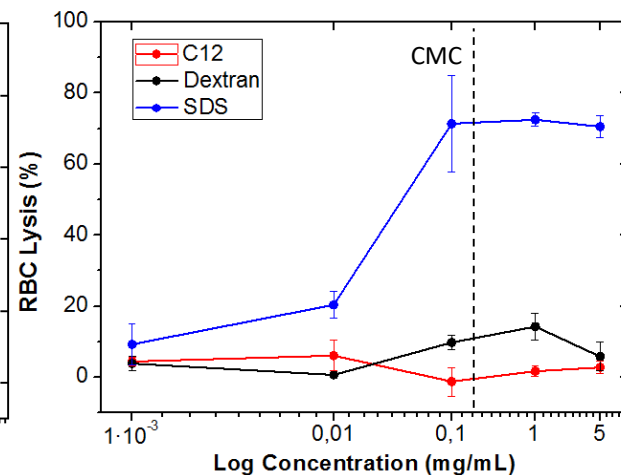
C6



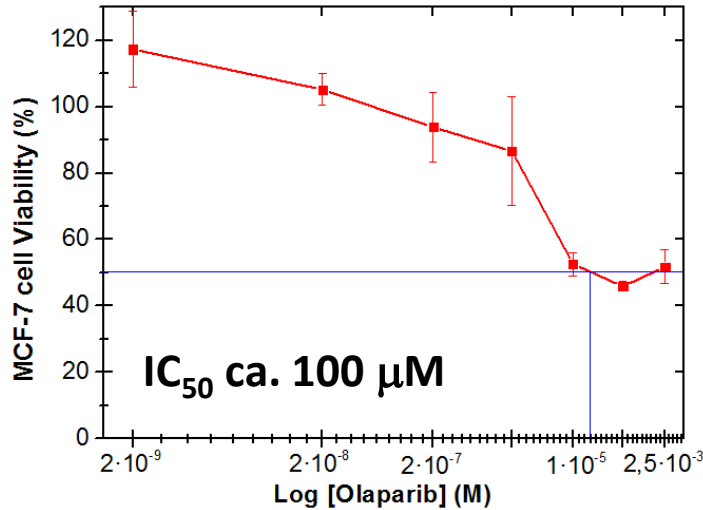
C8



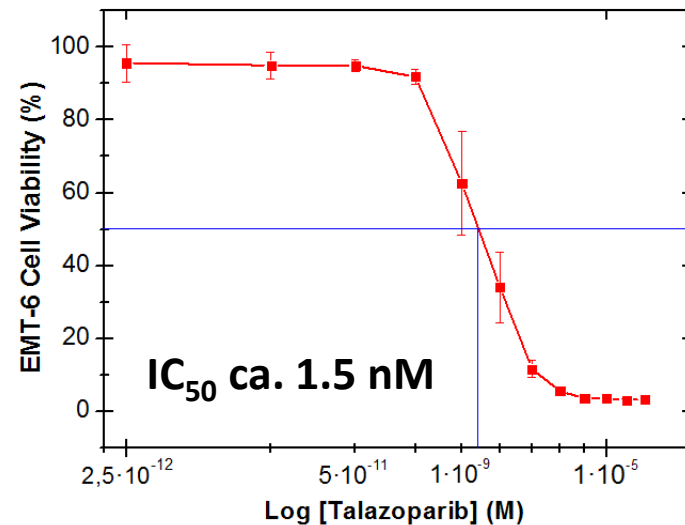
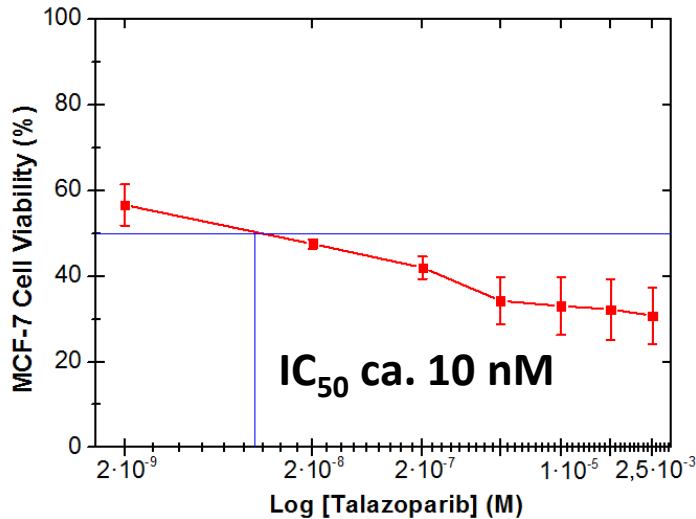
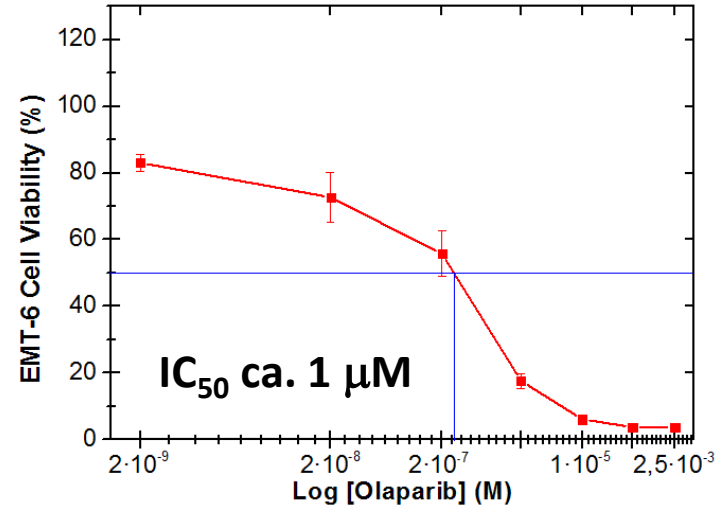
C12



MCF-7 (W-TYPE)

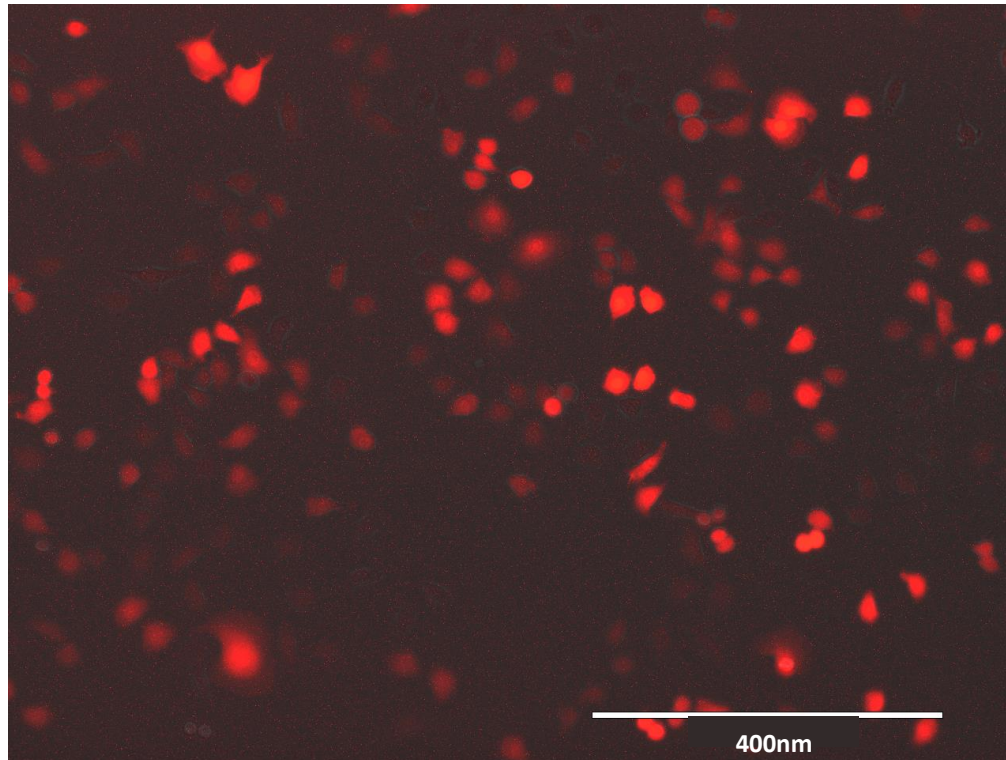


EMP-6 (BRCA MUTATED)



Working on BRCA Mutated 3D cell culture Cancer models

mCherry infected EMT-6 cells



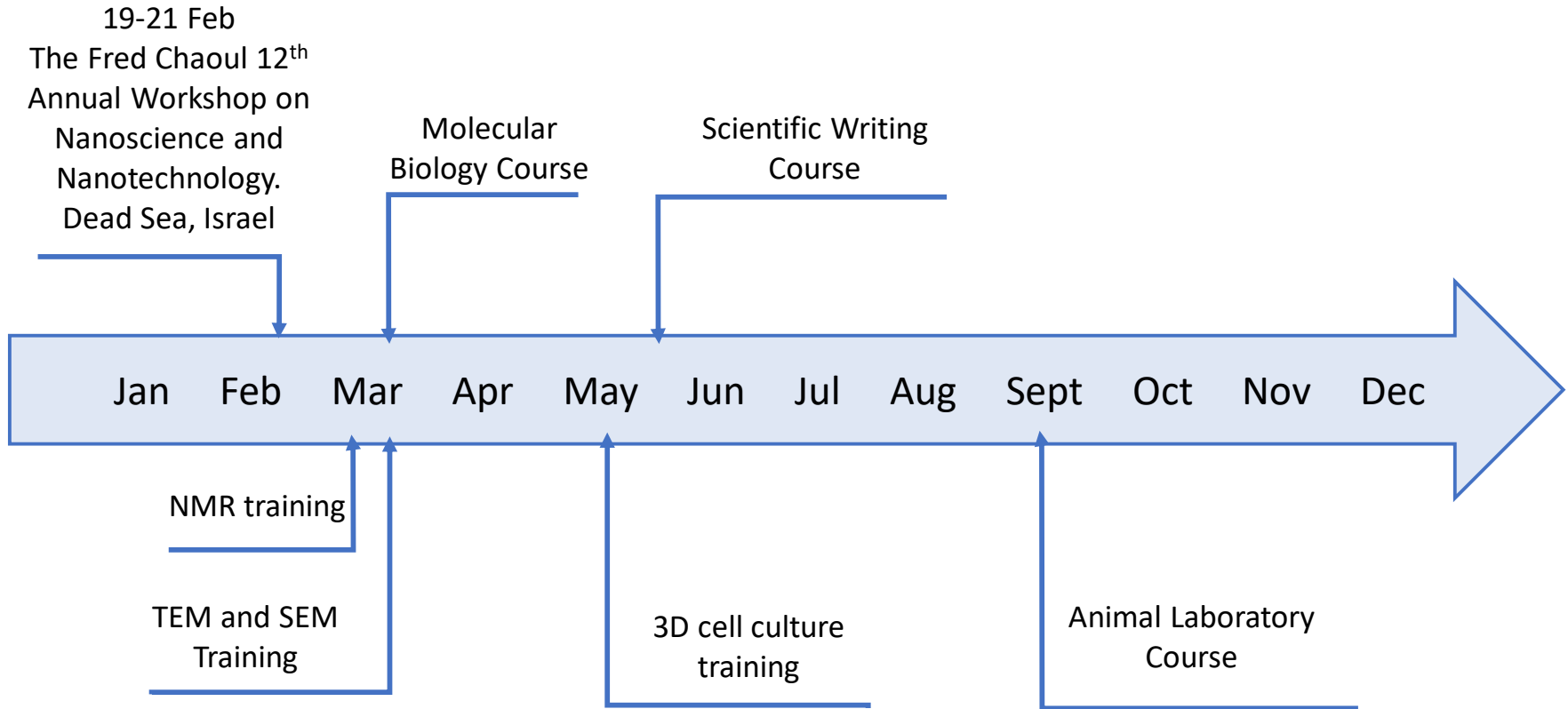
Secondment 1

1. Institution and sector: Institute for Bioengineering of Catalonia (IBEC)- Academic.
2. Duration: 4 months.
3. Main research objectives: Imaging of nanomedicines and ex-vivo samples by Super resolution confocal microscopy.
4. New knowledge and competences expected to be acquired: *In vitro* super resolution imaging. Stochastic Optical Reconstruction Microscopy (STORM).

Secondment 2

1. Institution and sector: TEVA. Non academic.
2. Duration: 3 months.
3. Main research objectives: Physico-chemical characterization of drug/dye-loaded nanoparticles.
4. New knowledge and competences expected to be acquired: Analytical methods for NP characterization by Raman spectroscopy.

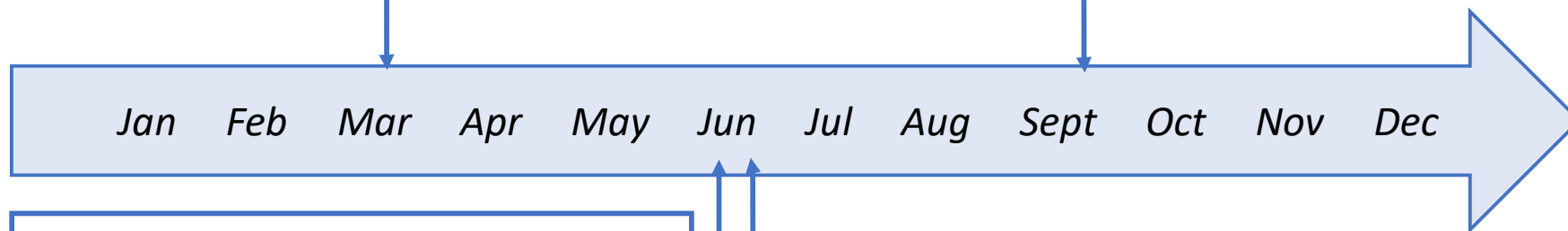
Local training



Network-wide training 2019

25-29 March
1st Meeting and
Training Event.
Eindhoven,
Netherlands

23-27 Sep
2nd Training Event
Basel, Switzerland



PhD studies

- University: Tel Aviv University
- Title of PhD: Nanomedicine
- Enrolment: 9/12/2018

6-7 June
Bioorthogonal and
Bioresponsive
Edinburgh, UK

5 June
Mid-term Check
Edinburgh, UK