TITLE
Modelling human cancers using Patient Derived Xenograft (PDX) models: generation and application

Overview of the course
Patient-derived xenografts (PDXs) have emerged as very informative models to study cancer. The course will start introducing PDXs generation and characterization processes. Then, it will focus on PDXs applications, including: (i) identification of driver genetic defects and targetable vulnerabilities; (ii) tumor-host dependencies and bilateral interactions; and (iii) design of effective therapeutic strategies. The PhD student will acquire the basis for PDX establishment and usage.

References
1. Gao H, et al. High-throughput screening using patient-derived tumor xenografts to predict clinical trial drug response. Nat Med. 2015 Nov;21(11):1318-25. doi: 10.1038/nm.3954. Epub 2015 Oct 19. PMID: 26479923.
2. Townsend EC, et al. The Public Repository of Xenografts Enables Discovery and Randomized Phase II-like Trials in Mice. Cancer Cell. 2016 Apr 11;29(4):574-586. doi: 10.1016/j.ccell.2016.03.008.
3. Garcia-Bermudez J, et al. Squalene accumulation in cholesterol auxotrophic lymphomas prevents oxidative cell death. Nature. 2019 Mar;567(7746):118-122. doi: 10.1038/s41586-019-0945-5. Epub 2019 Feb 13. PMID: 30760928; PMCID: PMC6405297.
4. Ng SY, et al. Targetable vulnerabilities in T- and NK-cell lymphomas identified through preclinical models. Nat Commun. 2018 May 22;9(1):2024. doi: 10.1038/s41467-018-04356-9. PMID: 29789628; PMCID: PMC5964252.
5. Fiore D, et al. A Novel JAK1 Mutant Breast Implant-Associated Anaplastic Large Cell Lymphoma Patient-Derived Xenograft Fostering Pre-Clinical Discoveries. Cancers (Basel). 2020 Jun 17;12(6):1603. doi: 10.3390/cancers12061603. PMID: 32560455; PMCID: PMC7352499.

Schedule (~6 hours)
The course will include three lessons (~ 2 hours each), as it follows.

Programme
Lesson one (Dr. Danilo Fiore, DMMBM): June 27, Monday, 3:00 p.m.
Seminar room 4th floor Torre Biologica
Developing cancer Avatars: PDX generation and characterization

Lesson two (Dr. Danilo Fiore, DMMBM): June 28, Tuesday, 3:00 p.m.
Seminar room 4th floor Torre Biologica
Harnessing PDX *potential* to study tumor molecular landscapes - heterogeneity – evolution – tumor/host vulnerabilities

Lesson three (Dr. Danilo Fiore, DMMBM): June 29, Wednesday, 3:00 p.m.
Seminar room 4th floor Torre Biologica
From the bench to the clinic: integrated PDX-based pre-clinical programs for precision medicine therapies in multiple diseases