Universitat Pompeu Fabra Barcelona

Master in Bioinformatics for Health Sciences

Master project 2021-2022

Personal Information

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Group	Evolutionary Processes Modeling

Project

Computational genomics

Project Title:

Selection on cancer genomes exerted by the immune system

Keywords:

cancer genomics, immune evasion

Summary:

Cancer is a genetic disease, caused by DNA mutations that accumulate in cells of the human body over the course of time. One of the most important lines of defense against cancer is the immune system. Consequently, detectable cancer tumors must have been able to evade the body's immune surveillance. We expect this feature of successful tumors to leave a footprint of selection in the cancer genome. The aim of this project is to investigate differences in selection between cancer tumors that evolved under different strengths of the immune response. To this end, we will use somatic mutations detected in over 10,000 tumors as well as the tumors' gene expression data. The project has a bioinformatics, a statistical data analysis, and a population genetics component. The student will learn all the corresponding techniques and tools regarding data analysis, partly in collaboration with other lab members.

References:

https://www.nature.com/articles/ng.3987 https://www.nature.com/articles/s41588-020-0687-1

Expected skills::

Programming, logical-analytical thinking

Possibility of funding::

Yes

Possible continuity with PhD: :

To be discussed