Universitat Pompeu Fabra Barcelona | Master in Bioinformatics for Health Sciences

Master project 2024-2025

Personal Information

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Project

Computational genomics

Project Title:

Comprehensive Analysis of RNA-Seq Data in Murine Fibroblast Cells During T. cruzi Infection

Keywords:

Chagas disease, Trypanosoma cruzi, fibroblasts infection, RNAseq.

Summary:

Trypanosoma cruzi, the causative agent of Chagas disease, is a protozoan parasite that infects millions of individuals worldwide, leading to a significant public health concern. Understanding the host-pathogen interactions during T. cruzi infection is crucial for developing effective therapeutic strategies. RNA sequencing (RNA-Seq) is a powerful tool to investigate the dynamic changes in gene expression that occur within host cells during infection. This proposed master's thesis project aims to perform a comprehensive analysis of RNA-Seq data from murine cells infected with T. cruzi. The primary objectives of this project are as follows: a) preprocess RNA-Seq data from murine cells infected with T. cruzi, b) perform differential gene expression analysis to identify genes and pathways affected by the infection, c) investigate the regulatory networks and signalling pathways associated with host responses to T. cruzi infection, d) explore potential therapeutic targets for Chagas disease based on the identified gene signatures. To successfully undertake this master's thesis project, the student should possess the following prerequisites: • The student must have a solid foundation in R, as this programming language is essential for the analysis of RNA-Seq data. Experience in other programming languages such as Python will also be appreciated. • Basic knowledge of command line prompts and the ability to navigate and execute commands in a terminal environment is also important. • An understanding of biological databases, such as GenBank, Ensembl, or NCBI, and experience in retrieving and interpreting biological information from these databases will be valuable. • The student must own a working laptop or desktop computer. This project can be carried out remotely, with the possibility of working on-site if the student decides to.

Expected skills:

See summary

Possibility of funding:

No

Possible continuity with PhD:

To be discussed