Oferta de treball de Màster en Biotecnologia: epigenètica de *Plasmodium falciparum*.

**Projecte de recerca (en anglès)**

The malaria parasite *Plasmodium falciparum* regulates at the epigenetic level the expression of a multitude of genes that participate in host-parasite interactions (clonally variant genes). In a population of parasites where all parasites have the same genes, individual parasites differ in the genes that they transcribe. We recently described a chromatin-based mechanism that controls variant expression in *P. falciparum*, and we comprehensively identified genes that undergo spontaneous transcriptional variation (the variantome). We also explored the functional consequences of clonally variant gene expression and demonstrated that spontaneous transcriptional variation plays a central role in malaria host-parasite interactions by controlling adaptation of the parasite to changes in its human host environment. Our results reveal that *P. falciparum* uses an unconventional survival strategy to adapt to changes in its environment, and also reveal a central role for epigenetic variation in many processes of parasite biology.

![Diagram](image.png)


The future research plans of the team include characterising in detail the epigenetic mechanisms controlling clonally variant expression, and studying the role of this type of expression in different biological processes. The selected candidate will mainly be involved in a project that aims to identify and characterize the key molecular components involved in the epigenetic regulation of clonally variant gene expression in *P. falciparum*. For this aim, we will use transgenic parasite lines with tagged components of the chromatin-modification machinery, to purify and characterize the multiprotein complexes involved in this regulation. Given the critical role of clonally variant expression in parasite survival and virulence, it is important to understand how this process is regulated. The selected candidate may also participate in other projects of the team aiming to identify the clonally variant genes responsible for adaptation to specific changes in the parasite’s environment.
For this project the candidate will use biochemical and molecular biology techniques [including Western blot, chromatin immunoprecipitation (ChIP), and protein purification], in addition to malaria parasite cultures. If the candidate continues in the lab as a PhD student, he/she would also use transcriptomics techniques (microarrays and/or RNA seq).

**Procediment**
Els candidats interessats hauran de contactar directament amb el Dr. Alfred Cortés (alfred.cortes@cresib.cat) per a concertar una entrevista personal.

Aquest és un grup de recerca petit on es fomenta el treball en equip. Es valoraran especialment candidats interessats en realitzar una tesi doctoral després del treball de màster, i que tinguin un bon expedient acadèmic que els permeti optar a convocatòries competitives de beques pre-doctorals.

**Publicacions del grup més rellevants per a aquest projecte**

This manuscript was selected as one of the May 2012 highlights (in full) in Nature Reviews Genetics (T. Casci, 2012, “Adaptation: Malarial bet hedging”, *Nat. Rev. Genet*. 13:298-9)

