

## MASTER THESIS PROJECT AT BRIC

### Role of histone demethylases in *C.elegans* development

In the nuclei of all eukaryotic cells, genomic DNA is tightly wrapped around histones into a compacted structure called chromatin. Histones are subject to a vast variety of post-translational modifications that remodel the structure of chromatin and specify the function of genomic regions in terms of chromosome segregation, DNA repair and transcriptional activity. Methylation of lysine residues, one of the most studied histone modifications, is regulated by several histone methyl-transferases and a newly identified class of histone demethylases, characterized by the presence of a Jumonji (Jmj)C-domain. Since methylation state of histone is an important clue during development, *C.elegans* is a suitable model system to study the *in vivo* role of these demethylases, largely conserved in nematode.

We aim to identify the roles of histone demethylases in a variety of processes such as embryonic and larval development, cell-fate decisions and organogenesis and a master thesis project is available at BRIC in the laboratory of Lisa Salcini.

The project consists in the characterization of mutant alleles carrying mutations in demethylases genes. Genetic (transgenic and mutant animals) and molecular biology techniques (microarray analysis, chromatin immunoprecipitation-deep sequencing, immunofluorescence) will be used to identify target genes and the mechanisms at the basis of the gene regulation by histone demethylases in relevant biological processes.



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#### References:

- Agger K et al. (2007). UTX and JMJD3 are histone H3K27 demethylases involved in HOX gene regulation and development. [Nature. 449\(7163\):731-4.](#)
- Christensen J et al. (2007). RBP2 belongs to a family of demethylases, specific for tri- and dimethylated lysine 4 on histone 3. [Cell. 128\(6\):1063-76.](#)