

INTERNSHIP PROPOSAL

Institute and Group: BIG/BGE/Gen&Chem

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Research project title:

Unraveling the different functions of the dUSP36 deubiquitinase

5 Keywords to describe the project:

Molecular genetics – Biochemistry – Physiology – Cell growth – Cell proliferation

Description of the project (aims, experimental techniques, recommended background):

Deubiquitinases (DUBs) are specific proteases which remove ubiquitin moieties from ubiquitinated proteins. DUBs regulate many biological functions including protein stability, cell signaling or endocytosis. Their dysregulation has been linked to many human pathologies, enlightening the importance of understanding how their different functions are coordinated and regulated. The *Drosophila* DUB dUSP36 is a valuable model to address these questions. The *dUsp36* gene produces three different isoforms with specific sub-cellular localizations. A deletion of this gene which inactivates all dUSP36 isoforms affects stem cell maintenance, regulation of the immune response, autophagy and cell growth. Using the CRISPR/Cas9 technology, we have introduced mutations in the *Drosophila* genome which specifically inactivate each one of the three dUSP36 isoforms. We have already observed that one of these mutants is specifically affected in MYC-dependant cell growth and proliferation. The M2 student will further characterize this phenotype and the phenotypes of the other isoform-specific mutants.

Justification that the internship's subject fits with the general theme of GRAL:

This project will provide integrated knowledge on the role of the deubiquitinating enzyme dUSP36 in various cellular processes including MYC-dependant cell growth and proliferation at the molecular, cellular and organismal levels.

Relevant publications of the team (3 max):

Crespo-Yanez X, Aguilar-Gurrieri C, Jacomin AC, Journet A, Mortier M, Taillebourg E, Soleilhac A, Weissenhorn W, Fauvarque MO. (2018) CHMP1B is a target of USP8/UBPY regulated by ubiquitin during endocytosis. *Plos Genetics*.

Jacomin AC, Fauvarque MO, Taillebourg E. (2016) A functional endosomal pathway is necessary for lysosome biogenesis in *Drosophila*. *BMC Cell Biol*.

Taillebourg E, Gregoire I, Viargues P, Jacomin AC, Thevenon D, Faure M, Fauvarque MO. (2012) The deubiquitinating enzyme USP36 controls selective autophagy activation by ubiquitinated proteins. *Autophagy*.