



PhD program 2022 call for proposals: LabEx fellowships



LabEx

MitoCross

Research Unit

Name: Génétique Moléculaire Génomique Microbiologie (GMGM)

Director of the unit: Dr. Ivan Tarassov

Code: UMR 7156

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Research team and team leader

Team: Dynamics and Plasticity of the Synthetases (DYPS)

Team leader: Prof. Hubert D. Becker

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Team members: 8
3 relevant publications:

Bader, G., Enkler, L., Araiso, Y., Hemmerle, M., Binko, K., Baranowska, E., De Craene, O. J., Ruer-Laventie, J., Pieters, J., Tribouillard-Tanvier, D., Senger, B., di Rago, J-P., Friant, S., Kucharczyk, R. & Becker, H. D. (2020) Assigning mitochondrial localization of dual localized proteins using a yeast Bi-Genomic Mitochondrial-Split-GFP. *eLife*. **9: e56649** (DOI: 10.7554/eLife.56649).

Yakobov, N., Debard, S., Fischer, F., Senger, B. & Becker, H. D. (2017) Cytosolic aminoacyl-tRNA synthetases: unanticipated relocations for unexpected functions. *Biochim. Biophys. Acta* **186,** 387-400.

Enkler, L., Rinaldi, B., De Craene, O. J., Hammann, P., Nureki, O., Senger, B., Friant, S.² & Becker, H.D. (2021) Cex1 is a component of the COPI intracellular trafficking machinery. Biol. Open. **10**, bio058528.

Number of PhDs in progress: (starting date) 1 (01/09/2019)

PhD supervisors

PhD director: Prof. Hubert D. Becker

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PhD subject

Title: Control of the Tor pathway by organellar echoforms of cytosolic aminoacyl-tRNA synthetases

Description: about 200 word

The PhD candidate will be in charge of developing a research project aiming to characterize the molecular mechanisms allowing vacuolar and mitochondrial isoforms of cytosolic aminoacyl-tRNA synthetases (aaRSs) to control the TORC1 complex in *Saccharomyces cerevisiae*. Indeed, these aaRSs enzymes have extended their functional repertoire beyond their critical role in protein synthesis and have been shown to participate in many signaling pathways. To date, only one aaRS has been reported to regulate the TORC1 complex which is a central node adjusting protein synthesis to aa availability and has been linked to several forms of cancers. The two hosting teams have jointly developed new tools allowing specific visualization and purification of organellar isoforms of cytosolic aaRSs together with their interacting partners and have shown that new aaRSs are involved in the control of the TOR signaling pathway in response to intracellular levels of aa. The PhD candidate will be in charge of establishing the interactome of these organellar isoforms in different nutritional conditions and to elucidate the molecular mechanisms by which they interact with TORC1 components and how they relay the nutritional sensing to the TOR kinase. A solid expertise in biochemistry, molecular biology and yeast genetics will be essential to address these challenges.

Key words:

TORC1 complex; aminoacyl-tRNA synthetase, S. cerevisiae, organellar echoforms, interactome, nutritional signaling