

Miguel Alcalde laboratory is fully competent in supervising PhD students due to the broad multidisciplinary profiles, international environment and facilities available in our group (with 10 Doctoral Thesis supervised in the last 10 years, three of them Premio Extraordinario de Tesis Doctoral, one awarded with the second prize Margarita Salas 2022 to the best Doctoral Thesis in the area of Science of Madrid), (further information at <https://miguelalcaldelab.eu/thesis/>). Typically, every Doctoral Thesis carried out in our group comprise a range of different experimental techniques and vanguard approaches that allow PhD students to acquire solid scientific basis while learning some of the most relevant aspects of applied biotechnology.

In terms of methodologies, the FPI-PhD student within **RAINBOW** project will learn a broad repertory of state-of-the-art methods in protein engineering and evolution including the direct use of sophisticated robotic high-throughput screening platforms. In this way, the student will have the unique opportunity to handle up-to-the-minute techniques that very few international laboratories can offer. More significantly, the PhD student will also learn key fundamentals of enzyme engineering from the generation of genetic diversity to protein biochemistry. Thereby, a Doctoral Thesis in the frame of **RAINBOW** will comprise the most relevant aspects for enzyme engineering towards specific biotechnology purposes while including concepts and methods on biochemistry, molecular biology, genetics and microbiology.

The international ambiance of our laboratory supplied by European projects and networks as well as the tight collaborations established with pioneering laboratories in the field of protein evolution (e.g. F.H. Arnold, Caltech, USA, Sarel Fleishmann, Weizmann Institute of Science) fully satisfy our PhD students who have the opportunity to make short-term stays in groups of reference in the ground of research or attending international forums and conferences including several European summer-schools on protein engineering, in which Dr. Alcalde is actively, for instance participating in the framework of ITN-EU projects and similar actions.

The Instituto de Catálisis y Petroleoquímica (ICP) is one of the leading research centers included in the area of Chemistry and Chemical Technologies of the CSIC. ICP is in the Campus of Excellence of the Universidad Autónoma de Madrid, which facilitates the collaboration of ICP researchers with different Departments in postgraduate courses and masters. It is worth mentioning that Dr. Alcalde is dynamically involved in different postgraduate programs, including the UAM Master of Biotechnology to which the FPI fellow could be registered. Given the broad training capacity and compromise in supervising PhD students of Prof. Alcalde, all the AEI projects in which he has been PI have carried associated a FPI student (*i.e.* Ana Isabel Vicente Martín (EVOFACEL project), Bernardo Gomez-Fernandez (DEWRY project), Patricia Gomez de Santos (LIGNOLUTION project); Dianelis Toledo Monterrey (current FPI associated to OXYWAVE project).

PhD Thesis defended in the last 10 years:

Note: all my PhD students have published their research in reputed scientific journals. Due to the space limitations, the full list of publication related to each student can be found at <https://miguelalcaldelab.eu/publications/>

10. Patricia Gómez de Santos. (FPI-student-LIGNOLUTION-BIO2016-79106-R). Title: "Directed evolution of unspecific peroxygenase: synthesis of human drug metabolites and design of functional fusion enzymes". Universidad Autónoma de Madrid. "**Premio Extraordinario de Doctorado**". "**Segundo Premio Margarita Salas de Investigación a la mejor Tesis Doctoral de Madrid**". **European PhD degree**. Date 16/12/2020. Current position: Scientist at EvoEnzyme (Torres Quevedo Program).

9. Bernardo Gómez Fernández. (FPI-student-DEWRY-BIO2013-43407-R). Title: "Directed evolution of ancestral and modern enzymes". Universidad Autónoma de

Madrid. **European PhD degree**. Date: 18/10/2019. Current position: Cofounder of EvoEnzyme S.L. Technology Manager of the company.

8. Javier Viña Gonzalez. Title: "Biotechnology platforms for aryl-alcohol oxidases by directed evolution". Universidad Autónoma de Madrid. "**Premio Extraordinario de Doctorado**". **European PhD degree**. Date: 03/10/2019. Current position: Cofounder of EvoEnzyme S.L. Science Manager of the company.

7. Javier Martín Díaz. Title: "Evolución dirigida de la peroxigenasa inespecífica de *Agrocybe aegerita*: Tolerancia a disolventes orgánicos mediante deriva genética neutral y evolución adaptativa".

Universidad Autónoma de Madrid. Date: 24/07/2019. Current position: Postdoc fellow at the Centro Andaluz de Biología del Desarrollo (CABD).

6. Ivan Mateljak. Title: "Directed and computational evolution of fungal laccases: enhancement of redox potential and chimeragenesis". Universidad Autónoma de Madrid. **European PhD degree**. Date: 18/10/2018. Current position: Scientist at EvoEnzyme (Torres Quevedo Program).

5. David González Pérez. Title: "Evolución dirigida de la peroxidasa versátil para el diseño de una levadura de podredumbre blanca". Universidad Autónoma de Madrid. Date: 16/12/2016. "**Premio Extraordinario de Doctorado**". **European PhD degree**. Current position: CAM-Talento Senior returning to my group.

4. Ana Isabel Vicente Martín (**FPI student-EVOFACEL- BIO2010-19697**). Title: "Evolución dirigida y enfocada de lacasas: termoestabilización y síntesis de colorantes heteropoliméricos". Universidad Complutense de Madrid. Date: 09/03/2017. Current position: Account manager in Gilson, Madrid.

3. Patricia Molina Espeja. Title: Diseño de la peroxigenasa inespecífica de *Agrocybe aegerita* mediante evolución dirigida: expresión funcional en levaduras y síntesis de 1-naftol". Universidad Autónoma de Madrid. Date: 31/03/2016. Current position: Project manager at ICP-CSIC.

2. Diana Maté Mate. Title: "Diseño de lacasas fúngicas activas en sangre mediante evolución molecular dirigida". Universidad Autónoma de Madrid. Date: 25/06/2013. **European PhD degree**. Current position: Project manager at UAM.

1. Eva García Ruiz. Title: "Evolución Dirigida de peroxidasa versátil de *Pleurotus eryngii* en *Saccharomyces cerevisiae*". Universidad Complutense de Madrid. Date: 15/11/2012. **European PhD degree**. Current Position: CAM-talento Senior, she has just got a permanent position at CSIC (Científico Titular, Tenured Scientist).