Precision Pathobiology for Disease Models (PATHBIO)

J. Ruberte and the PATHBIO Consortium

Overview

Mouse-based studies nowadays are essential for all Precision Medicine Initiatives, which aim to transform current medical practice to personalized healthcare.

However, the scientific community lacks sufficient human resources and expertise in mouse pathology to effectively and reproducibly characterize and validate these animal models.

Despite this increasing demand for mouse experts, there is a proven deficiency of specialized training opportunities for veterinary, medical and biomedical researchers to acquire the necessary expertise with recognized programs in Higher Education.

Furthermore, no single European University has all the expertise, resources and personnel required to design and establish a strong educational program.

For this reason several universities, research institution and companies have come together to develop an educational program to bring highly qualified researchers to the field of Precision Pathobiology.

Innovative aspect

PATHBIO has brought a new concept of Mouse Precision Pathobiology, breaking the boundaries between anatomical and histological laboratories integrating mouse morphology and functional anatomy through its different levels from the organic, passing through the histological level, to the cellular and subcellular levels and ending with mouse images obtained by X-ray, Computed Tomography (CT), and Magnetic resonance (MRI), thanks to the possibility to compare them with their equivalent histopathological images.

The combination of all these fields should increase the accuracy of morphological mouse phenotyping.

This integrative view has been the basis for the design and establishment of our strong educational program in Mouse Precision Pathobiology, which integrates pathology, anatomy, embryology, imaging, ontologies and informatics.

Impact

In the past 3 years, PATHBIO in collaboration with the IMPC and INFRAFRONTIER consortia has organized 9 Summer Courses (Mouse Anatomy and Embryology, Mouse Imaging, and Mouse Pathology).

During these years a total of 351 students (102 of them non-European) from 45 different countries (see map) have attended our courses. This shows the high interest that exists in the field of Mouse Pathobiology for an official, innovative and specialized teaching. Also, with the expertise gathered in these courses, PATHBIO has been able to design an Erasmus Mundus Joint Master.

The Consortium

Universities: *Universitat Autònoma de Barcelona (Spain), University of Cambridge (UK), University of Copenhagen (Denmark), Faculdade de Medicina Veterinária da Universidade de Lisboa (Portugal), Università degli Studi di Napoli Federico II (Italy), University of Sheffield (UK)*

Research Institutions: *MRC Harwell (UK), Institut Clinic de la Souris (France), Institute of Molecular Genetics (Czech Republic), Helmholtz Zentrum Muenchen (Germany)*

Companies: *The Jackson Lab (USA), The Centre of Phenogenomics Inc (Canada), Fujifilm Sonosite (Netherlands), Charles River (UK)*

Organizations: *FELASA, ICLAS*

Associated Partners: *Korean Mouse Phenotyping Center (Korea), Instituto Pasteur de Montevideo (Uruguay), Phenomics Australia (Australia), Tel-Aviv University (Israel), University of Cape Town (South Africa), Consiglio Nazionale delle Ricerche (Italy), INFRAFRONTIER*

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