Training School Preliminary Programme

Creating and Phenotyping Mouse Models of Disease and Ageing

23rd-25th November 2015

MRC Harwell, Oxfordshire, UK

Outline of the Training School

Mouse genetics has made major contributions to our understanding of mammalian physiology, genetics, and disease. In recent years there have been major advances in methodologies to manipulate the murine genome and the subsequent phenotypic analysis of mouse lines. In addition there are now major international resources to facilitate mouse genetics and phenotyping. This training school aims to provide an overview of recent advances in these areas by bringing together experts from across Europe. The training school will include sessions on colony management of genetically modified mice, strategies for creation of novel mutants and their subsequent analysis, and resources available such as bioinformatics resources, archives, and infrastructure. There will be an emphasis on a 'hands on' approach wherever possible. In addition there will be examples of the applications of novel mouse models and applications of phenotyping, and an emphasis on using mouse models to study ageing. Throughout the training school presenters will be sharing their experiences and be available for discussions with attendees. Several major national and international mouse initiatives will be represented including the Harwell Ageing Screen, The International Mouse Phenotyping Consortium, The European Mouse Mutant Archive, and Infrafrontier.

Confirmed Speakers

-Prof David Baker, Queen Mary's University, London

-Prof Ilaria Bellantuono, University of Sheffield, Chair of the MouseAGE COST Action

-Prof Steve Brown, Director, Mammalian Genetics Unit, MRC Harwell, Chair of the International Mouse Phenotyping Consortium

-Dr Michael Hagn, European Mouse Mutant Archive

-Dr Frauke Neff, Helmholzcentrum, Munich

-Dr Paul K Potter, Head of Disease Model Discovery, MRC Harwell

-Dr Sara Wells, Director Mary Lyon Centre MRC Harwell

COST is supported by the EU Framework Programme Horizon 2020

Monday 23rd November: Making Models

10.00 – 10.45 Introduction to the Aims of the Course

10.45 – 11.15 MouseAGE COST Action

11.30 – 12.30 Introduction to Modelling Disease in Mice
The utility of mouse models in understanding disease. Key examples of advances resulting from mouse studies including limitations of the mouse and arguments against using it as a model.

14.00 - 15.00 Overview of Existing Technologies to Generate Mouse Models
Summary of current technologies and strains. Transgenics, Talens, alleles.

15.00 – 16.00 CRISPR/Cas 9 Technologies
Mix of short talks and worked examples of how to generate CRISPR mutations, problems, status of technologies and outputs. Including worked examples of use of software packages for the design of CRISPRs, cloning strategies, analysis of outputs from CRISPR projects.

Tuesday 24th November: Analysing Models

Session 1: Phenotyping

9.30 – 10.30 Phenotyping Platforms
Utility and outputs from common phenotyping platforms. Importance of comprehensive phenotyping (pleiotropy).

10.30 - 11.30 Outputs from the Harwell Ageing Screen

12.00 - 14.00 2x 1hr Small Group Tours of MLC
Phenotyping and husbandry practises.
One group will have lunch while the other group has lunch.

Session 2: Know Your Models

14.00 – 15.00 MS Models and Experiences with Drug Trials in Mice
Examples of different approaches to disease modelling and assessing outcomes of interventions. Experiences with differences in mice affecting drug trials

15.00 – 16.00 Phenotypic Outcomes of Rapamycin Treatment Throughout Life
Analysing rapamycin treatment through detailed whole life phenotyping.

16.00 – 17.00 Know Your Strains: Importance of Genetic Background
Examples of variation seen in phenotypes in different mouse strains and the importance of good practice in colony management.

19.30 Training School Dinner

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Wednesday 25th November: European Infrastructures and Programmes

9.30 – 10.30	The Infrafrontier Network
10.30 - 11.15	Mutant Archives
11.15 – 12.00	The International Mouse Phenotyping Consortium
12.00– 14.00	Lunch/Discussions with Trainers
14.00 – 16.30	Bioinformatics resources *Worked examples at computers of using MGI, Ensembl and other important bioinformatics resources. Mixture of 20 minute talks and working at laptops through worked examples.*

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