



Priorities for mouse functional genomic research in Europe

**Training Management Group
Pathology Training Initiative - PTi**

Notes of meeting

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1 Background

- 1.1** PRIME will consider and suggest priorities for mouse functional genomics research in Europe over the next 10 to 15 years. These recommendations will be discussed with policy makers and funders of research in the European Commission and member states, with the aim of determining the most effective ways of supporting this research and associated infrastructures. This will pave the way towards the instigation of the European Research Area (ERA).
- 1.2** A key factor in maintaining the competitiveness of European research is training researchers with the necessary skills. We have identified the need to train people to be skilled mouse pathologists.
- 1.3** The working group will:
- assess the shortage of trained mouse pathologists
 - suggest factors contributing to the shortage
 - think of ways to provide and fund more training

2 Present

Paul Schofield, University of Cambridge, UK - Chairman
Laurence Fiette, University of Geneva, Switzerland
Björn Rozell, Karolinska Institute, Sweden
Madhuri Warren, Wellcome Trust Sanger Institute, UK
Marcello Raspa, CNR, Italy
Marco Breuer, Netherlands Cancer Institute, Netherlands
Pierre Dubus, University of Bordeaux, France
Hilary Gates, MRC Harwell, UK - PRIME Secretariat
Mandy Studley, MRC Harwell, UK - PRIME Secretariat

3 Skills required

3.1 Skills required of mouse pathologists:

- an understanding of genetics
- a knowledge of genetic backgrounds and strains of mice
- a professional training in human or veterinary medicine or human or animal pathology

4 Assessment of the shortfall of mouse pathologists

4.1 Existing surveys

- American College of Veterinary Pathology survey – Report and presentation given by Laurence Fiette
- British Society of Toxicological Pathologists - Madhuri Warren. Publication of Report expected in next few months. 40 vacancies available at the moment, mainly in Toxpath, and the BSTP are putting together a training initiative.
- NIH report - Bob Cardiff

- MW commented that 40% of medical consultant posts in the UK are vacant and there is no incentive to go into research. See 5 below.
- BR commented that Astra Zeneca had failed to recruit a head of toxpath in Sweden and had filled the post internally

4.2 New European Survey

- It was agreed to design a European survey.
- We need to find out how many mouse pathologists are needed
- We need to calculate how many blocks or tissues one pathologist can handle per year. Sanger, NKI and MRC Harwell have these numbers so we can calculate an average. There are RCPATH guidelines on the number of cases that can be handled per year by pathologists (Madhuri to find out) and for toxicopathologists (Laurence to find out). Estimates at the meeting were that 8-9000 slides should be read each year by a toxpath pathologist, and 4000 slides per year by a medical pathologist involved in additional duties.
- We need to find out how many pathologists are needed in mouse functional genomics research.
- We need to estimate the numbers of mouse lines investigated at institutes and whether they have a mouse pathologist. BR estimated that in Sweden there were 50 new lines per year of which about 20% were being subjected to pathological analysis and about 4 lines per year undergoing full investigation.

4.3 Distribution of European Survey

- Formal letter and survey to be mailed, website and emailed
- All EU projects
- EMBO participants
- FELASA
- Societies – Laurence and Pierre to do France/ Spain, Madhuri to do UK, Laurence –ESTP, ESVP, ECVP, Marcello – Italy,
- Meetings – presentation of what we are trying to do and leave questionnaires and info
- Send out survey to all institutional licence holders to find out path requirements

Questionnaire 1 – pathologists	Questionnaire 2 – institutions
What kind of set up	What facility?
Questions on the ACVP survey	How many mice lines are they investigating currently? (bins – 5 ranges)
How much time on mice if any	How many mice lines do they plan to investigate over the next 5 years? (bins – 5 ranges)
How many mice	Do they have dedicated mouse pathologist?
	How many mice does the pathologist investigate each year?
	Have they tried to recruit a pathologist?
	Have they experienced difficulties trying to recruit or retain a pathologist?

- Questionnaires will include general demographic information such as: country, institute, size, research area.
- Format to be agreed by November at PTI meeting in Amsterdam. Questionnaires to be released mid-2006. Results to be discussed in Barcelona, February 2007.

5 Factors reducing numbers of mouse pathologists

- No identified career paths
- Low salary if the pathologist has a medical training, but competitive for veterinarians
- Recruitment by USA of pathologists trained in Europe
- Mouse pathologists in industry are part of a high-throughput system and can feel undervalued, but this is dependent on the company. The appeal of jobs with good Pharma companies is not to be underestimated.
- Numbers of students training in veterinary and medical schools are increasing but retention in early/mid career is decreasing at least in the UK. Factors are: poor hours, poor pay, and lack of esteem.
- The state of vet training across Europe was discussed: In Netherlands there are a large number of unemployed vets; maybe 5% might be encouraged into research. Similar in Spain and Italy (13 vet faculties), but in UK there is a shortage and in France no excess.
- The funding for specialists is a problem and the DESV course in France is un-funded (students self fund). Most people who take up specialist training are heading for well paid jobs in toxpath.
- A high proportion of medical and veterinary students are women which can lead to them leaving and re-entering the professions because of family commitments. In principle family friendly working hours ought to be an incentive.
- Not all veterinary colleges across Europe train pathologists. They are examined on it, but offer no formal course work. They generally learn through a veterinary or industry residency. This is not true in the UK, where all vet schools have training programmes and trainees aim for National qualifications, MRCPPath, ECVP etc
- There is a need to balance high-throughput pathological investigations with allowing the pathologists to pursue their research interests and learning needs, e.g. ongoing training, attending scientific meetings, reading journals, setting up and maintaining a scientific research programme within their labs, etc.
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6 Training

6.1 Existing means of training

- In-house training within pharmaceutical companies
- MRC training fellowship held at MRC Harwell – provides training for MRCPPath and research project.
- The ECTP was discussed and it was noted that this model for training had had difficulty in directing candidates towards ECVP /MRCPPath success.

- In the US, there is the Programme at Davis and that run by John Sundberg on his NIH training grant at Jax which is a molecular mouse research training for vets programme which additionally gives training in mouse pathology.

6.2 Potential new means of training and funding

- Marie Curie Fellowships
- Marie Curie course with laboratory placements for 1 year
- Pan-European programme where national governments contribute and can nominate a set number of people per year to join the programme (e.g. 3 people)
- Universities are unlikely to have enough money to set up dedicated courses or mouse modules for existing courses
- Sponsorship of courses or full time training posts by industry, although these tend to be specialised and geared towards industry's needs
- There was concern that formal courses would need to be supplemented by extensive hands-on experience to be effective.

7 Methods to increase recruitment

- Need an incentive for vets or medics to train as pathologists with experimental mouse specialty
- Make medical and veterinary students aware of the opportunities to become a mouse pathologist
- Promote training in path as whole. There is a serious shortage of academic and professional veterinary and medical pathologists not just specialised mouse pathologists
- An attraction of pathology, in general, for medics is that there are no emergency shifts and no routine night shifts
- Should granting agencies oblige applicants to include money for pathology on their mutant mouse grants?

8 Methods of providing training - Options

We have examined several possible scenarios that could be used to train mouse pathologists. We outline the advantages and disadvantages of each model.

Who we train dictates to a large extent how we do it:

8.1 Are we looking at training DVM and MRCPPath level pathologists in a specialty?

- If so, will this be a formal qualification or 'in service training'?
- What are the advantages and disadvantages of taking on such a training without a formal qualification at the end?
- One problem may be that ECVP/MRCPPath or equivalent qualified pathologists may not be attracted to more training when they already have a specialisation and can walk into jobs on the back of that pre-existing expertise.
- Should this be effectively an internship/fellowship?

- This requires a set of existing centres of expertise such as Jax, Cornell and Davis in the US, or Stockholm, Harwell, Sanger in the UK etc., with senior pathologists already in place and a high throughput of mutant mice.

The problem of this is that it requires existing centres to act as nodes in a training network. Linking such nodes could give additionality which is not currently provided by existing schemes of this kind. One problem is; why pathologists should put the effort and maybe money into getting a formal qualification in mouse pathology which is a very narrow specialism. This argues much more for a training fellowship for pathologists in a specialist centre which revolves around a research project.

8.2 Do we adopt the model of the relevant units of the DESV for existing pathologists?

The DESV is a much broader qualification than just mouse pathology and is consequently more attractive. However, it is still self-funding and probably doesn't provide the level of experience of mutant mice which might be desirable.

8.3 Do we give training to molecular biologists?

Do we set them up for MRCPPath, or its equivalent, as is the case with the current MRC scheme? We need to bear in mind that this is a grant which covers 7 years training for MRCPPath and a post-doctoral research period. This is expensive, but probably effective. However, the UK alone allows non-veterinarians to obtain a recognised qualification in lab animal pathology (MRCPPath) as a sub-specialty of toxicology and this model would not work in the rest of Europe.

8.4 Do we train 'para-pathologists'?

These may either be pathology technicians or molecular biologists. They would predominantly be trained in identifying what is 'normal' and knowing when to refer and how to prepare material. Training should include a large amount of mouse genetics and familiarity with strain specific pathology.

8.5 Who will fund the training?

It is unlikely that people will fund it themselves, if there are not stable highly paid jobs at the end. A series of courses would be a useful adjunct but it was agreed that this was nowhere near enough to train people properly. Short courses might be run on a Marie Curie basis, although previous experience applying for funding for this has been disappointing. Funding could come from the Vet schools or ECVP (seems unlikely), collaboration with industry, research councils or their equivalents. It could be useful to look at joint funding between industry and national funding agencies but this would not obviously be in the interests of either industry or basic research, as both parties would be concerned that they would not be the direct beneficiaries.

9. Tasks

- Madhuri to obtain BSTP report and find out about BSTP training initiative
- Laurence to submit ACVP reports

- Bob Cardiff to be asked for NIH reports
- Laurence and others to estimate number of cases/slides which can be looked at each year
- Contact Franceseca Gueider in training programme at NIH.
- European survey: Format to be agreed by November at PTI meeting in Amsterdam. Questionnaires to be released mid-2006. Results to be discussed in Barcelona, February 2007.
 - Laurence and Pierre to get info on France and Spain
 - Madhuri to do UK with Mike Cheeseman
 - Laurence ESTP, ESVP, ECVP
 - Marcello , Italy