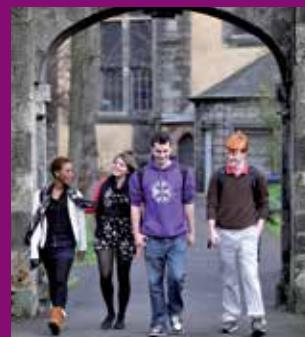


BBSRC EASTBIO Doctoral Training Partnership

Student handbook 2012-13



Introduction to the BBSRC EASTBIO Doctoral Training Partnership

Welcome to EASTBIO

EASTBIO is the East of Scotland Bioscience Doctoral Training Partnership (DTP). It was established in 2012, in response to a Biotechnology and Biological Sciences Research Council (BBSRC) call for new DTPs. Our partnership comprises the universities along the east coast of Scotland, a key region in the UK for life sciences in terms of both academic excellence and industrial support and investment. EASTBIO's primary aim is to deliver high-quality, cutting-edge training for bioscience PhD students. The partnership allows us to provide enhanced training opportunities for our students, and additionally offers outstanding opportunities for collaborative research across the universities of the east of Scotland.

The EASTBIO partners are:

University of Edinburgh
University of Aberdeen
University of Dundee
University of St Andrews

Our associate partners are:

Heriot Watt University
University of Stirling
Scottish Agricultural College

We work closely with two pan-Scottish research pools:

SULSA (Scottish Universities Life Science Alliance)
SUPA (Scottish Universities Physics Alliance)

Studentships:

We offered 35 fully-funded studentships to start in autumn 2012, with core funding from the BBSRC coupled with additional funding from each of the partner universities. We will offer a similar number of studentships starting in the autumn of 2013 and 2014.

Research themes:

Around 50% of our student projects are designed to meet key priority areas, as defined in the BBSRC strategic plan: <http://www.bbsrc.ac.uk/funding/priorities/priorities-index.aspx>

Bioenergy and Industrial Biotechnology

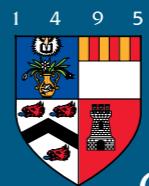
Food Security

Basic Bioscience Underpinning Health (Ageing)

The remaining 50% of projects will be across the spectrum of world-class underpinning bioscience funded by the BBSRC in our partnership.



THE UNIVERSITY *of* EDINBURGH



UNIVERSITY
OF ABERDEEN

Welcome from the Management Group

Dear PhD students,

We are delighted to welcome you to the BBSRC EASTBIO Doctoral Training Partnership as our first cohort of students. You have beaten off stiff competition to receive one of our 35 prestigious studentships. We hope that this handbook, our induction day and website will help to familiarise you with the aims of the partnership and our training programme.

EASTBIO is a partnership of four universities – Aberdeen, Dundee, Edinburgh and St Andrews - and each of you will be registered in a host school or department within your university. You will be following the local training and assessment programme of your host institution. However, through EASTBIO you will access additional enhanced training opportunities. These will include:

- interactive discussion groups run across the partnership based on our research themes, which will provide insight into the key research questions in your area and a chance to build your own collaborations with researchers working in your field across the east of Scotland;
- high level bioscience skills training, in areas such as systems biology and data analysis;
- our annual residential symposia where you will be able to share your research and develop its impact on the world around us; and
- an exciting new scheme of Professional Internships for PhD Students (PIPS), which will give you the opportunity to learn valuable skills in the workplace.

We ask that you each take a proactive approach to building your own training programme with the support of your supervisors and EASTBIO. You will be required to complete a skills audit and training record each year and we will monitor your progress to help ensure that you complete your PhD within four years, and graduate with a set of skills that will enable you to progress successfully on to your chosen future career.

As a new PhD student, you will be establishing yourselves in an exciting, vibrant research environment – meeting lots of new people, possibly finding your way around in a new city, country or culture and being bombarded with information on just about everything. If any of us can assist you with settling in, please don't hesitate to contact us (contact details are provided in this handbook).

We look forward to meeting you in person at our induction day which is hosted by the University of Dundee on Wednesday 17th October 2012 at the West Park Conference Centre. You will meet the other new EASTBIO students and supervisors at this induction and networking event.

Wishing you an excellent start to your studies,



Clare —

Professor Clare Blackburn
University of Edinburgh



B. Connolly

Dr Bernadette Connolly
University of Aberdeen



P. Crocker

Professor Paul Crocker
University of Dundee



Colin Farquharson

Professor Colin Farquharson
University of Edinburgh



Sue Healy

Dr Sue Healy
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Disclaimer: Every effort has been made to ensure that the information contained within this handbook is correct at the time of publication. EASTBIO training courses are subject to ongoing development which could necessitate cancellation of, or alteration to, the advertised courses. The EASTBIO DTP reserves the right to make changes at any time without prior notice. Should you notice any errors or inaccuracies on this or our website, please let us know by enquiries@eastscotbiodtp.ac.uk.



Introduction to the Training Programme

All of you will be registered in a host school, department or institute within your University, and we expect you to comply with the local induction and training requirements of your research group and host department. If you are unclear about these requirements, please contact your local administrative manager using the contacts in this handbook.

The EASTBIO DTP will provide you with enhanced training opportunities that will supplement the training provided to you locally. This aims to ensure that you receive training at the highest level possible, so you can make the best of your time as a research student and are equipped to compete against the best in the world when you move into your chosen career at the end of your studies.

Our training programme is made up of four strands:

Training Strand 1: Research Skills

Training Strand 2: Bioscience Skills

Training Strand 3: Generic Skills

Training Strand 4: Professional Internships for PhD Students (PIPS)

More detail on each of these strands is set out in this handbook. As well as the information in this handbook you should keep an eye on your emails and our website for updates.

How to build your personalised training plan

We recognise that each of you will start the EASTBIO PhD programme with different abilities and different aspirations. For this reason we have specified minimum expectations for the amount of training we expect you to complete during your 4 year programme, with some key events that are compulsory for all EASTBIO students. In fact, we expect that the majority of you will want to take advantage of more of the opportunities available to you than is required. The sheer range of training

options available to you in your host department and through EASTBIO may be overwhelming, so we suggest you start as soon as possible by working through our skills audit and developing your personalised training plan. We ask that you then complete your training record and update your skills audit and training plan at your annual review each year.

Skills Audit

We require each student to complete a skills audit upon beginning your PhD studies. This should be discussed with your supervisory team at the first available opportunity, and not later than 10 weeks into your PhD, to help you to develop your training plan. When developing your training plan, bear in mind what training will be most relevant at each stage of your PhD; you do not need to cram all of your training into year 1.

Our skills audit was developed with the Institute for Academic Development, based at the University of Edinburgh, and is founded on the attributes set out for researchers in the Vitae Researcher Development Framework.

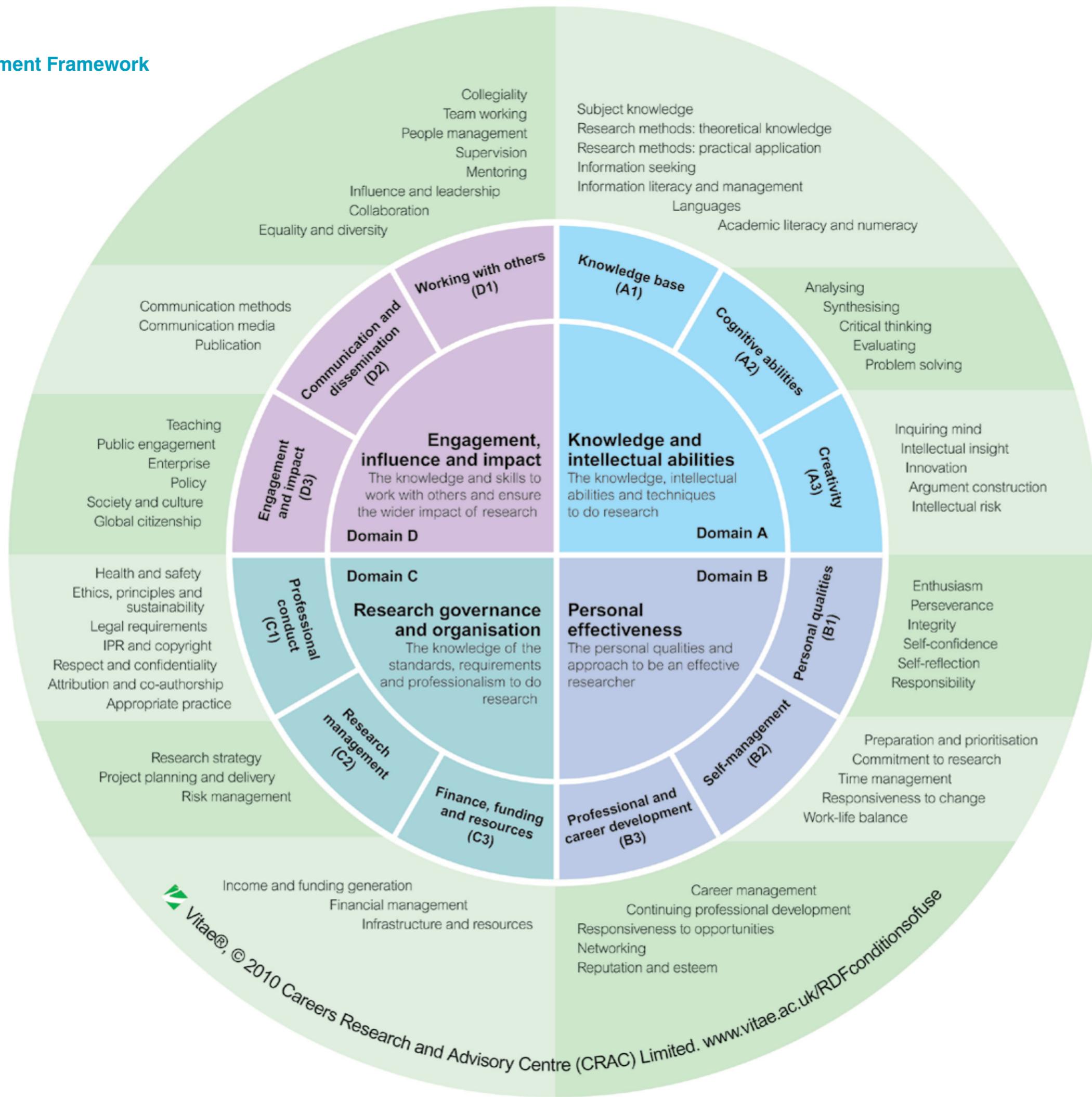
You can download the skills audit from the Student Resources section of the EASTBIO website.

Training plan and record

This document maps directly onto the development areas highlighted in the skills audit. You should complete your training plan after you have discussed it with your supervisor before week 10, and update your training record in advance of each annual review meeting that you have with your thesis committee. A copy of your training plan and record should also be sent to your local EASTBIO administrative manager annually.

You can download the training plan and record from the Student Resources section of the EASTBIO website.

Researcher Development Framework



Training development

One of the main aims of the EASTBIO DTP is to share existing training provision across the partnership and develop new training in response to the needs of you and your supervisors, and your future employers. If you cannot find the training you need, contact your local EASTBIO managers, as they will have a good overview of the training offered across the four partner institutions and through SULSA and SUPA. If you still see a gap in provision, please contact enquiries@eastscotbiotp.ac.uk with a view to filling that gap.

Costs incurred through training

We aim to provide all your training free of charge or at a minimal cost. Each of you will have access to the following funds (in addition to fees and stipend) to support your training:

- Travel and conference allowance: £230 per annum which will cover most of the expenses involved where training is delivered in person rather than online. Please ask your local administrator if you are unsure how to access these funds.

- Research Training Grant: £5000 per annum (this is reduced to £2500 in year 4). This grant may be held directly by you or your supervisor or it may be held by your department. It should be used to cover the purchase of a laptop at the start of your programme, the research costs incurred by your project and may also be used to cover any more expensive travel and training costs incurred. Please ask your local administrator if you are unsure how to access these funds.
- PIPS Grant: Where your PIPs will incur significant additional costs you can apply to our competitively allocated grants competition. Further details of this competition can be requested from SULSA.

Your Training Programme: Summary of Requirements

All EASTBIO students must complete your first skills audit and training plan by 10 weeks. Thereafter you must complete your training record annually and then revise your skills audit and training plan for the upcoming year. The training record must be submitted annually to your local EASTBIO administrative contact and supervisory committee.

The skills audit, training plan and record can be downloaded from the Student Resources section of www.eastscotbiotp.ac.uk.

All EASTBIO students must take part in the following mandatory components of the training programme:

- Induction in year 1**
- Training Strand 1 – Research Skills:** a minimum of one 10 session course of theme training in year 1
- Training Strand 2 – Bioscience Skills:** a minimum of 40 hours training to be undertaken by the end of year 4
- Training Strand 3 – Generic Skills:** a minimum of 20 hours training each year plus attendance at the Symposium each year
- Training Strand 4 - PIPS:** an internship of 3 months duration to be undertaken by the end of year 3



Training Strand 1: Research Skills

EASTBIO student projects starting in 2012 are designed around four key research themes:

Bioenergy and Industrial Biotechnology

Food Security

Basic Bioscience underpinning Health (Ageing)

World-class Bioscience

Details of which research theme you belong to and your theme leader will be given at Induction on 17th October when you will also have an opportunity to meet other students from your thematic group.

As part of one of these thematic groups, you will be required to take a 10 session eLearning course that will introduce the key areas in your theme and develop your critical reading skills. The course will be discussion based and so it will also give you a chance to get to know the other EASTBIO students and supervisors working in similar or complimentary fields to your own. Each theme has a theme leader and it may be that they develop follow up activities for you and your theme group after this initial 10 session course.

Getting started with Blackboard Collaborate for eLearning

This course will be run using Blackboard Collaborate, a simple to use web-based platform that creates a virtual, interactive classroom that can be accessed from your own computer. You will be given an introduction to Blackboard Collaborate and its features during Induction and detailed instructions for getting started with Blackboard Collaborate, our eLearning software, will be downloadable from the Student Resources section of our website.

The research training provided through EASTBIO will supplement the training you will already receive in your research group and host department. We expect all EASTBIO students to be actively involved in the research culture of your group and department. Do take advantage of all that is there for you including optional undergraduate and MSc modules, journal clubs, seminars and conferences in your field.



Training Strand 2: Bioscience Skills

During your PhD studies, you will need to develop the key skills that will underpin your research as a bioscientist. As an EASTBIO student you are expected to build up a minimum of 40 hours of training throughout your PhD. We are particularly keen that all our students develop skills in mathematics and data analysis and new ways of working, skills which the BBSRC believe to be essential to future research careers.

We expect that you will find most of the bioscience skills training you need in your host university. However, places can be made available on training courses at partner universities for EASTBIO students on request, so if you cannot find the training you need at your host university please send an email to your local EASTBIO administrative manager for assistance in identifying useful courses elsewhere within the partnership.

In the first year of EASTBIO, we will offer a limited number of places on the following additional optional courses, available on a first-come, first-serve basis. Dates for these are to be confirmed. To register for any of these please email enquiries@eastscotbiotp.ac.uk. We hope to add to this group of courses as the partnership develops, so please keep your eye on your emails and our website.

Optional courses 2012/13:

Experimental Design

Course Leader: Professor Kim Summers,
Roslin Institute, University of Edinburgh
Delivery: Online, using Blackboard Collaborate
Date: November 2012, date tbc
Hours: 2

Most undergraduate and MSc practical sessions involve following an inflexible series of steps provided in the lab manual. Students hope to get the "right" answer but there is no opportunity to repeat the exercise if things go wrong. As independent researchers you will now have to design experiments yourselves, starting from a hypothesis that attempts to explain an interesting

observation. There are no wrong or right answers, just outcomes that support or refute the hypothesis. Almost inevitably one series of experiments leads to further hypotheses and the design of additional experiments to assess these new or revised hypotheses. In this presentation we will look at the steps in this cycle of hypothesis generation and examine the elements of a properly controlled experiment to test a new hypothesis.

SysMIC

Course Leader: Dr Geraint Thomas, University College London
Delivery: Online, using Moodle
Date: January 2013, date tbc
Hours: 30 per module

SysMIC (Systems training in Maths, Informatics and Computational Biology) a web-based course in the techniques fundamental to the study of biology at the systems level, available to all BBSRC funded researchers and EASTBIO has provisionally booked spaces for all of you. SysMIC will launch nationally in January 2013 and will comprise three sequential modules that will progressively develop your skills. EASTBIO strongly recommend that you take at least Module 1. A list of module components is given below. Further details can be found at www.sysmic.ac.uk.

Module 1:

Basic quantitative skills for systems biology

- 1.0. Introduction
- 1.1. Review & expansion of key concepts (functions, graphs, rates of change)
- 1.2. Linear systems: the basics (first steps to working with systems of equations)
- 1.3. Networks (methods for describing and handling complicated interactions)
- 1.4. Probability and Statistics (working with data)
- 1.5. Modelling (introducing a systematic approach)
- 1.6. Modelling challenges I: (First steps in confident model making)

Module 2: Intermediate skills for systems biology

- 2.1. Functions of more than one variable. Functions of 2 continuous real variables.
- 2.2. More on linear systems.
- 2.3. Discrete systems
- 2.4. ODE models and non-linear systems
- 2.5. Diffusion systems:
- 2.6. Stochastic systems.
- 2.7. Data handling:
- 2.8. Modelling challenges II: (Further steps in confident model making).

Module 3: Developing advanced skills through project work

Students will rotate through several different projects, probably every two months, so that each represents roughly 25 to 30 hours of work. Our aim will be to maximize the diversity of methods applied and the topics and system scales analysed.

To supplement the content in the SysMIC course, EASTBIO is working to develop two further courses which are likely to run in the 2013/14 academic year:

- **Additional mathematical skills for biologists**
(Course Leader: Professor Mark Chaplain, University of Dundee)
- **Using Python to test scientific hypotheses**
(Course Leader: Professor Peter Swain, University of Edinburgh)

Full details of these courses will be announced, so please keep an eye on your email.

Mass spectrometry-based proteomics course

Course Leaders: Professor Juri Rappaport & Dr Juan Zou, University of Edinburgh
Delivery: Face to face 2.5 day course, Edinburgh
Date: April 2013, tbc
Hours: 13

The proteomics lectures are designed to give students an introduction to the concepts and applications of the underlying technologies.

Lectures will address the following questions:
What is a mass spectrometer?
How is a protein identified?
How to quantify changes in protein composition?

In addition to the lectures there will be a combination of tutorials and computational practicals that illustrate how proteins are prepared for mass spectrometric analysis and how the acquired data are analysed to identify and quantify proteins.

R/Bioconductor and Unix

Course Leader: Dr Simon Tomlinson, University of Edinburgh
Delivery: Face to face 2 day course, Edinburgh
Date: June 2013, tbc
Hours: 14

This course focuses on the analysis of gene expression data from microarray and high-throughput sequencing platforms, using R, Bioconductor and Unix. Day 1 will provide an introduction to data analysis approaches, principles and common pitfalls and an introduction to R, Bioconductor and other resources for data analysis. Day 2 will cover analysis of microarray gene expression data and of next-generation sequencing data (RNA-seq).



Training Strand 3: Generic Skills

Introduction to generic skills training

The acquisition and development of personal transferable, employment-related and generic research skills is an important part of postgraduate research training. It is now an expectation of most research councils as outlined in the Researcher Development Framework, and is strongly recommended by EASTBIO.

To be competitive in your future career it is vital that you engage with training beyond the essential needed for your own research. As the knowledge economy expands, employers expect advanced professional skills in addition to excellent qualifications. Focussing on skills which complement your academic research and enhance your employability will give you a competitive edge both now and in the future.

How to access generic skills training

All EASTBIO students are required to complete 20 hours of generic skills training in each year of your programme; you should record the training you attend and the number of hours completed on your training record. We expect that you will find the key generic skills training you need in your host university. However, places can be made available on training courses at partner universities for EASTBIO students on request, and you will also find that the BBSRC and Vitae provide additional development opportunities. As well as information

provided to you by your host department, you will find the following key links essential in identifying courses:

Aberdeen: www.abdn.ac.uk/sfre

Dundee: <http://www.dundee.ac.uk/opp/courses/>

Edinburgh: www.ed.ac.uk/schools-departments/institute-academic-development/postgraduate-doctoral

St Andrews: <http://www.st-andrews.ac.uk/capod/students/pgresearch/>

BBSRC: <http://www.bbsrc.ac.uk/funding/studentships/training-bulletin.aspx>

Vitae: <http://www.vitae.ac.uk/researchers/1218/Postgraduate-researchers.html>

EASTBIO strongly recommend two online generic skills courses:

MANTRA: Research Data Management Training
<http://datalib.edina.ac.uk/mantra/>

eWriting: Writing Skills for Graduate Students
<http://www.ewriting.org.uk/>

(Please email enquiries@eastscotbiotp.ac.uk if you are not an Edinburgh registered student as we will need to request access for you.)

Annual symposia

We will also include specially designed generic skills development in our annual summer symposium, which you must attend. Our first symposium will focus on the how to develop the social impact of your research and will be hosted by the University of Aberdeen who have been awarded funding as one of the eight Research Council Public Engagement with Research Catalysts: look out for emails about the event later this year. The symposia are a great chance to meet up with your fellow EASTBIO students and supervisors, tell them all about your research and develop additional generic skills.



Training Strand 4: Professional Internships for PhD Students (PIPS)

Introducing PIPS

A PIPS is a three-month internship in a non-academic setting. It is a compulsory part of the EASTBIO training programme. The PIPS will provide you with work experience in a professional setting that does not relate directly to your PhD work.

The introduction of PIPs has been recommended by the Bioscience Skills and Careers strategy panel, which advises BBSRC on its strategy for investment in bioscience skills and careers. Wider professional experience for PhD students was identified by the panel as an area of high priority for action by BBSRC. A wide variety of career paths are open to researchers and the ability to move between different roles and sectors can be key to maximising the impact from your PhD training, as well as to achieving a successful and fulfilling career.

Some advantages of the PIPS:

- It will help you understand the wider context of your research – appreciate the “bigger picture” – and maybe make you a better researcher as a result.
- It will expose you to a range of opportunities that are available to you after your PhD graduation – not all students go on to be Post-docs and Professors!
- It will build your confidence in the workplace and make you more employable.
- It will make you a more rounded individual by broadening your horizons.
- It will give you opportunities for professional development.
- It will allow you to do work-based learning in a non-higher education environment and to manage career expectations outside academia.
- It will also give you experience of job-application processes and requirements. (Job searching, CV writing, interviews, etc.).
- It will allow you and your research group to build new relationships with non-academic organisations that could lead to long-term collaborations.

What type of internship makes a suitable PIPS?

A PIPS is a defined project with tangible outcomes that can be carried out in any organisation, as long as it gives you a professional experience out with your immediate research-related environment.

These are just a few examples:

- A defined and applied research project in industry (not related to your PhD topic unless you are a CASE student).
- Managing a non-research project.
- Administering a research project or grant.
- Developing policy for a research council or government.
- Carrying out a marketing project for a company or organisation.
- Communicating science to the public or younger pupils through an outreach programme.
- Developing or helping to develop a new product or service for a company

It can be carried out in different sectors: Industry, Teaching, Policy, Media, Consultancy, Knowledge Exchange ... this is a chance to think creatively about the types of experience you would like to gain.

It is important that you think about what you would like to do, and how the PIPs will benefit your research, training and career in the long term. This is not a stop-gap, but a valuable life experience.

Planning your PIPS

Your PIPs should be planned cooperatively between you, your supervisor and the PIPs provider, with support provided by SULSA, as part of your first year report and review process. It is important to note that flexibility should be a key factor to ensure compatibility of the internship with you, your PhD project and the internship host-organisation.

Timing is important: you must ensure it does not interfere with your research and should aim to complete your PIPS within years 1-3 of your PhD.

Think of the following possible constraints:

- The timing of your most important experiments
- Field-work seasons you may need to work around
- Resource bottle-necks in your research project
- Conferences and meetings you may want to attend
- PhD thesis writing and your submission deadline
- Family commitments
- Other training requirements and opportunities

Planning ahead will give you more choice and maximise the chances of doing something you actually want to do. Please also try to *think laterally* ... PIPS can be a three-month continuous placement or can be carried out in tranches e.g. one day a week over 18 months.

We believe that you should lead on the choice of PIPS, so that it is most useful to your development, but SULSA will provide support and suggestions if you need them, so please do get in touch.

You may also want to complete some relevant generic skills training in preparation for your PIPS, such as:

- CV writing and interviewing skills
- Entrepreneurship
- Time management
- Communication skills

You should submit your PIPS plan to SULSA, your thesis committee and your local administrative manager for approval by your first year report deadline at the latest. You can download the PIPS plan form from the Student Resources section of the EASTBIO website.

PIPS Reporting Requirements:

It is a requirement to produce a report of your experience and submit it to your thesis committee and local administrative manager within 3 months of the completion of the PIPs.

This report should include the following elements:

- A brief report on the work carried out including a signed statement from the PIPs provider that you attended and completed the project
- A case study (maximum of 2 sides of A4). Please see below for guidelines on how to write a case study.

You can download a PIPS report form and case study guidelines from the Student Resources section of the EASTBIO website.

PIPS: Summary of requirements

A 3-month (or equivalent duration pro rata) PIPS is a compulsory element of the EASTBIO training programme and must be completed within 3 years of your PhD start date.

It should be planned by the student in consultation with your supervisor and proposed PIPS host.

Advice can be provided by SULSA: admin@sulsa.ac.uk.

Deadline for submission of PIPS plan form to thesis committee and local EASTBIO admin manager: within 1 year of your PhD start date.

Deadline for submission of PIPS report and case study to thesis committee and local EASTBIO admin manager: 3 months after completion of PIPS and within 4 years of your PhD start date.

The PIPS plan and report forms and case study guidelines can be downloaded from the Student Resources section of: www.eastscotbiotp.ac.uk



EASTBIO Contacts

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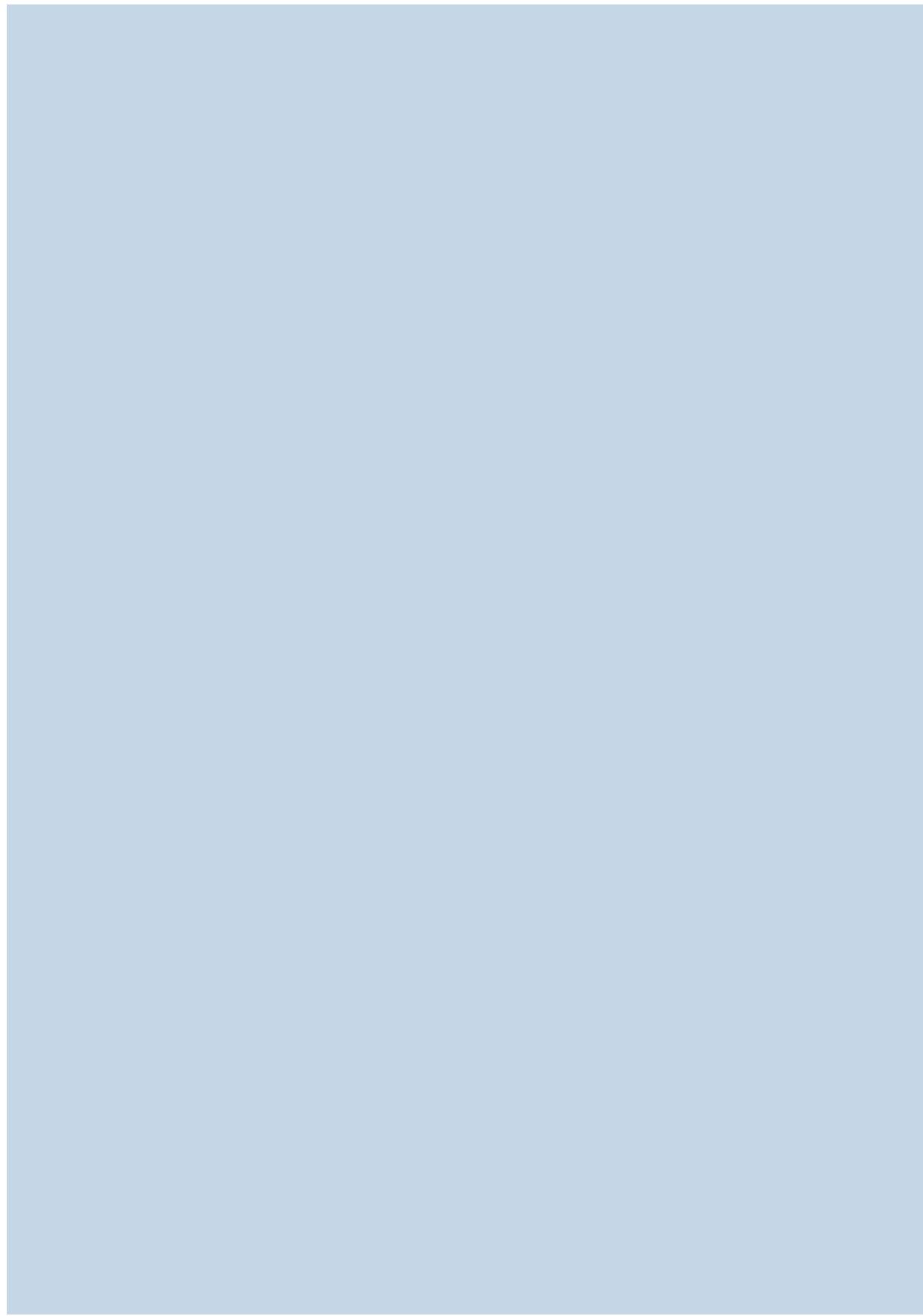
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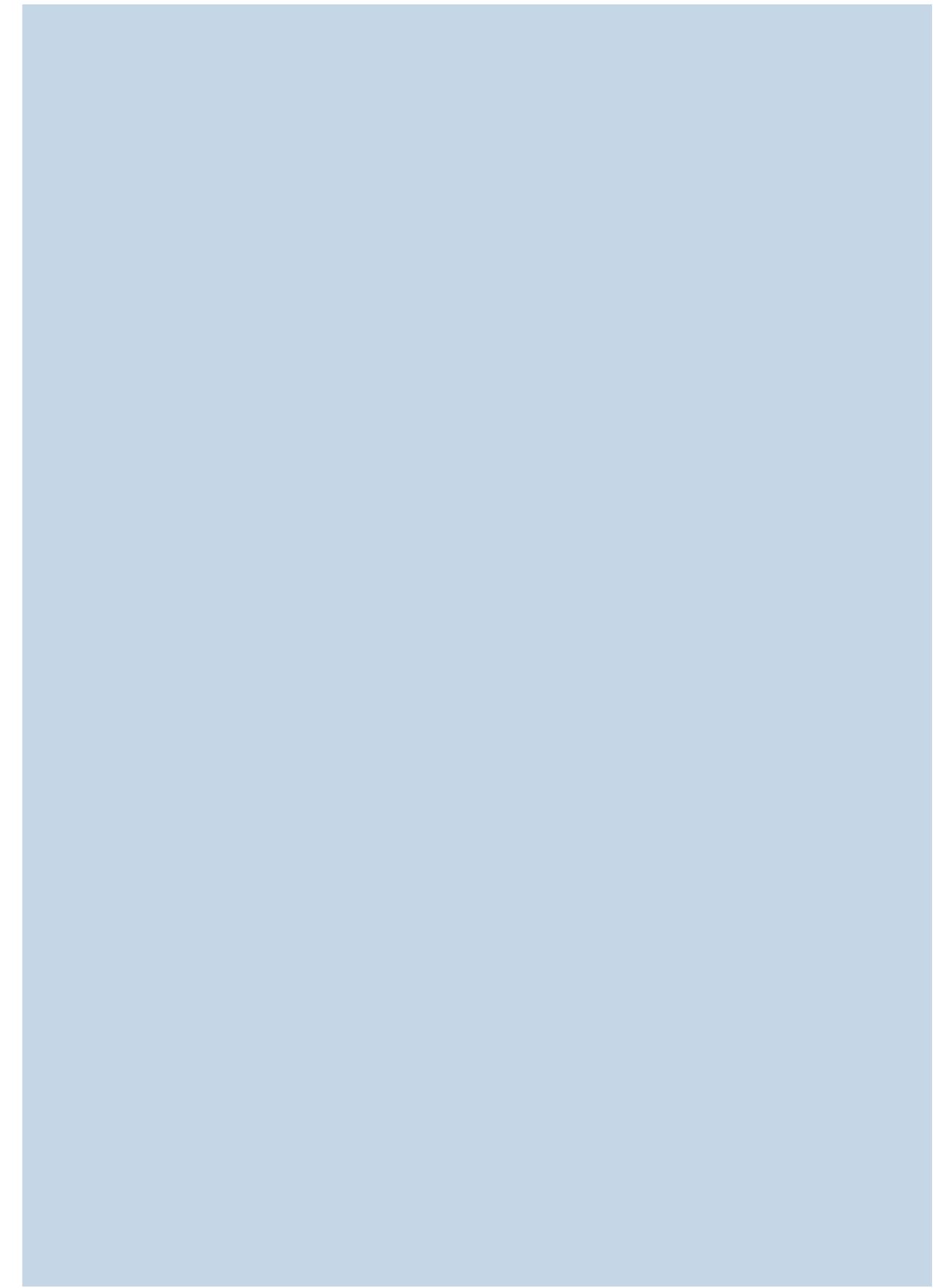
You!

We are looking for volunteer student representatives from each partner university to act as our student representation committee. You'll get the chance to feedback to the management group on training and other support for EASTBIO PhD students and will have a major role in developing our annual symposia. We'll ask for volunteers at the induction day, but if you are already interested please send an email to enquiries@eastscotbiotp.ac.uk.

Notes



Notes



Designed by Graphics Lab, Learning Technology Section, The University of Edinburgh.

This publication can be made available in alternative formats on request.

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