Welcome

IGMM Graduate Research and Training Contacts

Staff Student Liaison Committee/Officer

GRADUATE RESEARCH & TRAINING HANDBOOK 2019
Welcome

We are delighted to welcome you to your postgraduate training programme at the Institute of Genetics and Molecular Medicine. On the following pages you will find information relating to the different programmes, timetable for the first 6 months, and the assessment timetable for the next 3 or 4 years.

As you probably know, we have a mixture of students on campus, some of whom are following a four year PhD programme with rotations and others who are starting a three year PhD in a specific lab, whilst others are studying for an MSc or MD. There are some teaching elements of the four year taught course that might be of interest to other students, for example covering different technologies, computer programming, aspects of clinical research and research ethics - these are shown in a detailed timetable. This teaching is only compulsory for the 4-year HGU students, but other students (and postdocs) are welcome to sign up and attend any sessions that you find useful; you might want to discuss your choice with your supervisor(s). We hope that the IGMM Graduate Research and Training environment will provide a useful framework for your studies. Please feel free to air your views, and to approach us about any issues you have, and help us to make the IGMM a huge success!

Graduate Research and Training contacts

The IGMM is made up of three centres, the MRC Human Genetics Unit (HGU), the Centre for Genomics and Experimental Medicine (CGEM) and the Cancer Research UK Edinburgh Centre (ECRC), each with their own Graduate Convenor. The IGMM falls within the School of Molecular, Genetic and Population Health Sciences (you will need to know this School affiliation when you apply for Transkills courses amongst other things), and the SMGPHS is within the College of Medicine and Veterinary Medicine or CMVM.

In the first instance you will mainly deal with your supervisors, Graduate Convenor or Nick Gilbert (Director of Graduate Research and Training for the IGMM). You will also have a thesis committee (normally setup about 10 weeks into your PhD) which will be made up of your supervisors, an external advisor and a committee Chair. Formal issues (interruption of studies and so on) are dealt with by the Director of Graduate Research and Training and the College PG Office.

Head of School of MGPHS
Professor Harry Campbell

Director of Graduate Research and Training, IGMM: Professor Nick Gilbert

Graduate Convenor, CRUK Edinburgh Centre: Professor Val Brunton

Graduate Convenor, MRC Human Genetics Unit: Professor Nick Gilbert

Graduate Convenor, Centre for Genomic & Experimental Medicine: Dr Kathy Evans

Director of PG Studies, College of MVM
Dr Paddy Hadoke

Staff Student Liaison Officer
Dr Martin Reijns

Graduate Research and Training Administrator
Pauline McDonald

Graduate Research and Training Assistant
Alana Johnson
Staff Student Liaison Committee/Officer

At the IGMM we are committed to ensuring a high-quality student experience. To ensure we are able to deliver this, and to “maximise our students’ potential”, we encourage students to communicate their views and suggestions to help influence any required changes to policies and procedures. The IGMM Staff Student Liaison Committee (SSLC) meets biannually to discuss matters of mutual concern of staff and students. The SSLC is composed of student and staff representatives, and we strongly encourage students at any stage of their graduate degree to consider joining the SSLC. The current Staff Student Liaison Officer (SSLO) is Dr Martin Reijns.

Martin is a senior research scientist in Professor Andrew Jackson’s laboratory in the MRC, Human Genetics Unit. Within IGMM we have a mentoring system for PhD students. This “buddying” programme pairs 1st-year students who wish to be involved with friendly and supportive final year students; and aims to help with their integration into the institute, informally answer any questions and queries regarding their PhD, and also to offer support with beginning a new life in Edinburgh.

If you want to know more, or would like to be paired up, please get in touch with Martin; also if you are interested in becoming a representative to the SSLC.

Email: martin.reijns@igmm.ed.ac.uk
Telephone: 651 8633
Location: MRC Human Genetics Unit

What to do if things go wrong

If you have a problem with your project and/or supervisor, you should first try to resolve it between yourselves - it is important to keep lines of communication open where possible and not let things degenerate. If there is still a problem, then please seek advice - you should feel free to speak to your second supervisor, your thesis committee Chair, the Directors of the Graduate School or the PG Convenor for your building.

These conversations will be in confidence and a strategy will be devised to try and address any problems. Additional meetings of thesis committees can be arranged (subject to members’ availability) if the student and/or supervisors feel that this would help. If you are not happy with the outcome of frontline resolution (and on the rare occasions where a local resolution is not an appropriate early step) the University has procedures in place for dealing with complaints and the IGMM adheres to these procedures rigorously. Details of these can be accessed through the CMVM Postgraduate Wiki which is also accessible from the IGMM Graduate Research and Training web pages.
## Induction Week

### Monday 9th September

**IGMM welcome, PG Directors and Student Admin team**  
- 12:00-13:00  
  East Seminar Room, IGMM

**Health and Safety Induction, Rosie Russell**  
- 13:00-14:00  
  East Seminar Room, IGMM

**Buddy Event, Martin Reijns and POGS - Tea, Coffee and biscuits provided**  
- 14:00-16:00  
  Nucleus Café, IGMM

### Tuesday 10th September

**IT familiarisation - Dave Perry and the IT team**  
- 09:00-11:30  
  Greenfield Suite, George Square

**Postgraduate Research students talk and service fair**  
- 12:00-13:30  
  McEwan Hall, Teviot Place - Edinburgh, EH8 9AG  
  Booking Link: [https://www.ed.ac.uk/students/new-students/welcome-week/postgraduate-welcome-events/events-for-postgraduate-research-students](https://www.ed.ac.uk/students/new-students/welcome-week/postgraduate-welcome-events/events-for-postgraduate-research-students)

**CMVM PGR Welcome Talk**  
- 13:30-14:30  
  G.03, Medical School, Doorway 6, Teviot Place, Edinburgh

**Social and Networking Event**  
- 14:30-16:00  
  Playfair Library, Old College, South Bridge, Edinburgh

### Wednesday 11th September

**Public Engagement Event - Dee Davison and Sarah Thomas**  
- 09:00-10:00  
  CRUK Edinburgh Centre - South Seminar Room

**Health and Wellbeing Welcome / Induction - Andy Shanks**  
- 10:00-11:00  
  CRUK Edinburgh Centre - South Seminar Room

**Library Services Induction - Ruth Jenkins**  
- 12:00-12:30  
  CRUK Edinburgh Centre - South Seminar Room
Thursday 12th September

HGU Scientific Talks - HGU 4 year programme students
- 09:15-09:30 - Introduction to HGU Rotations
- 09:30-09:45 - Nick Gilbert
- 09:45-10:00 - Chris Ponting
- 10:00-10:15 - Erola Païro-Castineira
- 10:15-10:30 - Joe Marsh
- 10:30-10:45 - Malcolm Dunlop
- 10:45-11:00 - Break
- 11:00-11:15 - Bob Hill
- 11:15-11:30 - Chris Haley
- 11:30-11:45 - Catalina Vallejos
- 11:45-12:00 - Liz Patton

- 12:00-13:00 - Welcome lunch provided
  (opportunity to meet supervisors and discuss projects)

- 14:15-14:30 - Ian Adams
- 14:30-14:45 - Javier Caceres
- 14:45-15:00 - Maria Christophorou
- 15:00-15:15 - Alison Meynert
- 15:15-15:30 - Duncan Sproul
- 15:30-15:45 - Break
- 15:45-16:00 - Gillian Taylor (Andrew Wood Lab)
- 16:00-16:15 - Hemant Bengani (David Fitzpatrick Lab)
- 16:15-16:30 - Andrew Jackson
- 16:30-16:45 - Greg Kudla
- 16:45-17:00 - Richard Meehan

CRUK Edinburgh Centre - Seminar Room, IGMM

All new students are welcome to attend, especially the new HGU based students
### Friday 13th September

**Top Tips and Tricks (With Social Committee)**  
- 09:30-11:30  
  East Seminar Room, IGMM

**Disability Service Induction - Jan Gardiner**  
- 11:30-12:30  
  CRUK Edinburgh Centre - South Seminar Room

**Technical Services - Stewart McKay and Lizzie Freyer**  
- 14.00-15.00  
  CRUK Edinburgh Centre - South Seminar Room

**TGIF - Postgraduate Student Society Event - Juliet Luft & Philippa Jackson**  
Refreshments and snacks provided  
- 15:30  
  Nucleus Café, IGMM

### Timetable

#### September 2019

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td>Monday 16th</td>
<td>HGU Students finalise first rotation</td>
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<tr>
<td>Tuesday 17th</td>
<td>Introduction to HGU 4-year teaching programme and assessment - Nick Gilbert</td>
<td>09:00 – 10:00</td>
<td>E4.07</td>
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</tbody>
</table>
| Thursday 19th | Good Research Practice and Data Management - Helen Nickerson, Kerry Miller & Elvina Gountouna  
  Annual POGS Pub Quiz | 09:00 – 12:00  
  17:00 – 20:00 | South Seminar Room  
  Nucleus         |
| Monday 23rd   | Reading and Evaluating the Scientific Literature - Maria Christophorou, Catherine Naughton & Dee Davison  
  Experimental Design - Luke Boulter & Kevin Myant | 09:00 – 12:00  
  14:00 – 17:00 | E4.07          |
| Monday 30th   | Experimental Design - Luke Boulter & Kevin Myant  
  Journal Club 1 - Peter Tennant and Robert Foster | 09:00 – 12:00  
  14:00 – 17:00 | E4.07          |
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<th>Date</th>
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<tr>
<td>October 2019</td>
<td>Scientific Blogging - Wendy Bickmore &amp; Cherry Martin</td>
<td>09:00 – 11:00</td>
<td>E4.07</td>
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<td>Software Carpentry - Graeme Grimes</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>EDDIE - John Ireland</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Git - Mario Antonioletti</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Next generation sequence analysis - Alison Meynert</td>
<td>09:00 – 12:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Journal Club 2 - Christina Schoenherr &amp; Emily Webb</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>ENSEMBL - Gogo</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Learning PYTHON</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Next Generation Sequencing Technology - Lee Murphy, Nick Gilbert &amp; Richard Talbot</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Journal Club 3 - Craig Anderson &amp; Vera Kaiser</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>November 2019</td>
<td>R for Biologists - Graeme Grimes</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>UCSC and IGV browser - Gogo &amp; Graeme</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>R for statistics - Biomathematics and Statistics Scotland - Nick Gilbert &amp; Neil Clark</td>
<td>09:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Monday 11th</td>
<td>Experimental Models Systems - Alessandro Brombin, Ian Adams &amp; Malcolm Dunlop</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Journal Club 4 - Carolina Uggenti &amp; Marie-Therese El-Daher</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<tr>
<td>Monday 18th</td>
<td>Imaging - Ann Wheeler and Imaging team</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Advanced Proteomics and Metabolomics - Andy Finch &amp; Alex von Kriegsheim</td>
<td>14:00 – 17:00</td>
<td>S1.15, ECRC</td>
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<tr>
<td>Monday 25th</td>
<td>Translating your research - Andrea Taylor &amp; Helen Nickerson</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Analysing imaging data - Laura Murphy</td>
<td>14:00 – 17:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>December 2019</td>
<td>Genome Engineering - Andrew Wood &amp; Pleasantine Mill</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td></td>
<td>Journal Club 5 - Nele Hug &amp; Luciana Gomez Acuna</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<tr>
<td>Thursday 5th</td>
<td>Student Christmas Talks (2018 intake)</td>
<td>14:00 – 17:00</td>
<td>South Seminar Room</td>
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<td>Monday 9th</td>
<td>Drug Development - Stefan Symeonides &amp; Neil Carragher</td>
<td>09:00 – 12:00</td>
<td>Room E4.07</td>
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<td></td>
<td>Rotation 1 - Talks (assessed)</td>
<td>14:00 – 17:00</td>
<td>Room E4.07</td>
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<tr>
<td>Monday 16th</td>
<td>Break for Christmas</td>
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<td>January 2020</td>
<td>Biological insight from mutation patterns - Martin Taylor</td>
<td>09:00 – 12:00</td>
<td>MEC, Computing Lab, WGH</td>
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<td>Journal Club 6 - Faith Davies &amp; Katerina Gospodinova</td>
<td>14:00 – 17:00</td>
<td>Room E4.07</td>
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<td>Thursday 16th</td>
<td>Biomedical Genomics - Erola Paio-Castineira &amp; Oriol Canela Xandri</td>
<td>09:00 – 12:00</td>
<td>Computer lab/ E4.07</td>
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<td>Inheritance of bowel cancer susceptibility: Molecular and phenotypic consequences - Malcolm Dunlop</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<tr>
<td>Date</td>
<td>Topic</td>
<td>Speaker(s)</td>
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<td>Monday 20th</td>
<td>Using protein sequence and structure to understand and predict pathogenic and benign mutations</td>
<td>Joe Marsh</td>
<td>09:00 – 12:00</td>
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<td></td>
<td>Evolution of human genome structure</td>
<td>Colin Semple</td>
<td>14:00 – 17:00</td>
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<tr>
<td>Thursday 23rd</td>
<td>Interacting with industry</td>
<td>Andrea Taylor &amp; Jon Moore (CEO of Phenotx)</td>
<td>09:00 – 12:00</td>
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<tr>
<td>Monday 27th</td>
<td>How does protein - DNA binding alter disease risk?</td>
<td>Chris Ponting</td>
<td>09:00 – 12:00</td>
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<td>Dissecting the genetic control of complex trait variation</td>
<td>Chris Haley</td>
<td>14:00 – 17:00</td>
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<tr>
<td>Thursday 30th</td>
<td>An industry case study</td>
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<td>09:00 – 12:00</td>
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<td>February 2020</td>
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<tr>
<td>Monday 3rd</td>
<td>Journal Club 7 - John Russell &amp; James Crichton</td>
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<td>14:00 – 17:00</td>
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<tr>
<td>Thursday 6th</td>
<td>Disease Epigenetics</td>
<td>Duncan Sproul</td>
<td>09:30 – 12:00</td>
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<tr>
<td>Monday 10th</td>
<td>Using molecular biology and polymer physics to understand chromatin architecture</td>
<td>Nick Gilbert</td>
<td>09:00 – 12:00</td>
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<td>RNA processing in health and disease</td>
<td>Javier Caceres</td>
<td>14:00 – 17:00</td>
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<tr>
<td>Monday 17th</td>
<td>Condensin and cohesin complexes: regulation of chromosome structure during development and disease</td>
<td>Andrew Wood</td>
<td>09:00 – 12:00</td>
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<td></td>
<td>Genome stability in the mammalian germline</td>
<td>Ian Adams</td>
<td>14:00 – 17:00</td>
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<td>Monday 24th</td>
<td>How are genes regulated?</td>
<td>Wendy Bickmore</td>
<td>09:00 – 12:00</td>
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<td>Journal Club 8 - Robb Hollis &amp; Emma Hall</td>
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<td>14:00 – 17:00</td>
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<tr>
<td>Thursday 27th</td>
<td>Essay writing workshop</td>
<td>10:00 – 12:00</td>
<td>E4.07</td>
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<td>March 2020</td>
<td><strong>Saturation Mutagenesis</strong> - Greg Kudla</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>How do transcription factors control development? - Dimitrios Papadopoulos</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>Monday 9th</td>
<td><strong>Modeling melanoma in animal model systems</strong> - Liz Patton</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Studies of a human retrotransposon - Jose Garcia-Perez</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>Monday 16th</td>
<td><strong>Signalling in adult tissue homeostasis, regeneration and cancer</strong> - Luke Boulter</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td>Journal Club 9 - Alison Meynert &amp; Jeanette Baran-Gale</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<tr>
<td>Monday 23rd</td>
<td><strong>Genome Architecture in Development</strong> - Bob Hill</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td></td>
<td><strong>Disease Mechanisms</strong> - Toby Hurd</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>Monday 30th</td>
<td><strong>Examplar of post-GWAS functional analyses applied to common eye diseases and conditions</strong> - Veronique Vitart</td>
<td>09:00 – 12:00</td>
<td>E4.07</td>
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<td></td>
<td>Rotation 2 - Talks (assessed)</td>
<td>14:00 – 17:00</td>
<td>E4.07</td>
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<td>April 2020</td>
<td><strong>PhD start</strong></td>
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<tr>
<td>Monday 6th</td>
<td><strong>PhD start</strong></td>
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MRC Institute of Genetics & Molecular Medicine

NHS Outpatients Building Computing Suite 1
Medical Education Centre, 3rd Floor
MRC Institute of Genetics & Molecular Medicine
Cancer Research UK Edinburgh Centre South Seminar Room S1.14

First Floor
IGMM South

The IGMM South Building can be accessed via Link Bridge South from the 2nd and 3rd Floors of IGMM Central.

MRC Institute of Genetics & Molecular Medicine
East Seminar Room E4.07

Fourth Floor
IGMM East
Assessment Guidelines for all students

GRADUATE RESEARCH & TRAINING HANDBOOK 2019
Assessment Guidelines

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<tr>
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<th>MSc by Research</th>
<th>3 year PhD</th>
<th>4 year PhD</th>
<th>MD</th>
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<td>10 week report</td>
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<tr>
<td>1st year report</td>
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<tr>
<td>2nd year report</td>
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<td>3 year report</td>
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**10 week report:**
These reports should be fairly short, so the word limit is set to approximately 1000 words (this is just text so does not include title, references, abstract or figure legends). Since this report is being written at the beginning of your PhD, we are most interested in what you plan to investigate over the next year. The report should include:

- **Title**, and the names of you and your supervisor.
- An abstract of less than 100 words.
- Introduction that provides enough background information for the reader to understand the proposal and that puts the scientific question(s) into context.
- A section that states the scientific question(s) that are being asked and the aims of the project.
- A short section on any progress made to date.
- A section describing your proposal for the next year’s work.
- Figures can be added in any section to help describe the project or to show any data that you have obtained in the first few weeks of your project. Figure legends should provide succinct description of the figure.
- Reference List.

Keep the report succinct and to the point. On completion, this report should be submitted to the Graduate Research and Training team: [student-admin@igmm.ed.ac.uk](mailto:student-admin@igmm.ed.ac.uk). Following submission of your 10-week report, you will be given feedback in the form of an email and/or meeting (depends on PhD programme).

**First Year Review:**
The next assessment stage is the first year review. College guidelines are followed, as below.

This rigorous review will consist of three elements:

- a written report from the student
- a meeting between the student and the thesis committee
- a written report by the interview panel (incorporating supervisors’ reports)

Students’ written report: The written report should adopt a logical format and be of a high standard. It should be typed and free of typographical and grammatical errors. A clear statement of the aims of the project should be included in addition to a brief account of methods and their validation.

Whilst it is recognised that at this stage students may not have substantial data, preliminary results should be documented and interpreted with a clear statement of intent as to immediate future studies (these might be expected to form the basis of discussion at interview). The text should be referenced as for a scientific paper and references listed at the end of the report. It is expected that the report
should be around 5000 words. It should incorporate diagrams, figures and tables as necessary. Preliminary drafts of the report should be discussed with supervisors. It is often useful to ask your supervisor for an example report from a previous student.

The thesis committee meeting will consist of the student, all the student’s supervisors including a day to-day lab supervisor where appropriate, an external committee member and a Chair. The external may be from the same building if necessary, but should be independent of the supervisors. The Chair should be someone with extensive experience of PhD student supervision of at least Senior Lecturer level.

The student’s report should be available to members of the thesis committee at least one week before the thesis committee meeting, allowing time for adequate consideration of the reports.

**Meeting**

This is the student’s opportunity to demonstrate his/her suitability to progress as a PhD student. The meeting is normally expected to include a short (10-15 minute) presentation by the student introducing the project, describing methodology and any preliminary results and identifying future studies. Students are strongly encouraged to rehearse with supervisors before the interview. It should be expected that the assessment panel will discuss specific points of content and organisation arising from the written report during the course of interview. The student should have an opportunity to initiate a dialogue and, if appropriate, raise matters of concern with the panel.

**Feedback**

The panel should make a formal assessment of the student’s written report, performance at interview and overall progress. The student should be informed of the panel’s view immediately thereafter. The panel will then write a report normally within 1 week of the interview summarising the assessment. Good and very good progress should be credited; any unsatisfactory aspects of performance should be clearly defined with an attempt to identify underlying reasons for this. It should make clear recommendations as to subsequent progress and action and be signed by all members of the Panel. The student will have an opportunity to see the report, and be able to discuss strengths, weaknesses and any issues of concern with the Chairman of the panel in the absence of his/her supervisor(s). The student should also be able to add comments separately before signing the report.

Copies of the final signed report and the signed report of the thesis committee must be sent to the Graduate Research and Training team: student-admin@igmm.ed.ac.uk, who will then make copies available to the IGMM PGSC and will forward a copy to the Secretary of the College Postgraduate Studies Committee. It should be stressed that an unsatisfactory report may be used as the basis for re-registering students for a different degree or even discontinuing studies (see outcomes). It is therefore essential in the case of a student failing to achieve required standards at review, that clear details of remedial action or the reasons for change in registration are documented.

**Outcomes**

An initial recommendation is required as to whether student progress is satisfactory or is inadequate in one or more aspects. Satisfactory students will continue to be registered as PhD students. In the case of inadequate performances a further recommendation from the review panel will be needed in terms of whether the student is:

- re-assessed at the end of a period of study not exceeding 18 months of initial registration
- re-registered for a different degree or change in period of study or discontinued
It would be expected that students should be totally unsatisfactory or severely deficient in several areas of their study for options (b) and (c) to be recommended without the opportunity for reassessment.

Second / Third Year Review
There is a second year thesis committee meeting for which the student is expected to produce a second year report. This need not be as long as the first year report but should contain a clear indication of achievable plans for the final year and an outline plan for the thesis. The signed report of the thesis committee and the College official report form should be sent to the Graduate Convenor for signing as for first year reviews (above). For four year and continuing students there will be continuing reviews every year until submission.

Final Year
Students should prepare to give a seminar to IGMM staff. Students should plan to talk for approximately 20 minutes (5 min Q&A session) and should include a summary of their project to date.

Postgraduate research annual review
Postgraduate students are required to complete an annual review form regarding their studies, with their Postgraduate Supervisor or Lead Supervisor’s input.

The form will be completed online via the MyEd Student Self Service channel, and students should receive an automated email to let them know that their review is active. Students should upload all relevant documents and reports in the review.

The online student portal (EUCLID) can also be used to record other important milestones in your training in Edinburgh and your supervisor may log individual meetings with you on this system.

MSc students
Students will have a first and second supervisor according to the same rules as PhD students (supervisors must not be within the same lab, with the exception of associate supervisors).

Students will have a thesis committee comprised of the supervisors plus one external member who will also act as Chair.

Students will complete a 10 week report comprising a literature review and plans that will be approved by the supervisors. The student will also copy this report to the relevant Centre PG Director and to Pauline. They will meet with the external committee member to discuss the report.

After 6 months (12 months for part time students), the student will write a progress report. This need only be 1-2 pages covering progress so far, and what remains to be done. The thesis committee will meet at this stage to discuss the report, and the student will give a talk at the start of the meeting.

By 10 months (20 months for part time students) the student should start to draft the thesis so that there is time for the supervisors to approve the contents.

Regulations and guidance
The Postgraduate Assessment Regulations for Research Degrees require that all Postgraduate Research students (with exception of MSc (R) students) have an annual review – and give the recommendations that are available following each annual review.

Guidance and instructions can be found on the Student Systems website, which provides instructions on how students are notified of their requirement to complete the form online and how the annual review form is processed within the University:
https://edin.ac/2OVdkDJ

For further information also check the CMVM postgraduate Wiki
http://edin.ac/2crLMTx
General information
• Postgraduate transferable skills programme
• Social media
• POGS
• Social committee
The acquisition and development of generic research and transferable skills is an important part of postgraduate training. Courses covering a wide range of skills are available to postgraduate research students in the Graduate School of Medicine & Veterinary Medicine through the transferable skills programme. This programme concentrates on the professional development of postgraduates, providing courses directly linked to postgraduate study (e.g. Thesis Workshop, Good Practice and Academic Paper Writing) and future careers (e.g. Successful Career Strategies for PhD Students, Local GRADschools). The programme also provides information on other training opportunities for postgraduates.

Courses are free of charge to postgraduate students in the College of Medicine and Veterinary Medicine. The programme has been designed to be as flexible as possible so that each student can tailor the content and timing of the programme to their own requirements. Most courses are run several times each year and last for between half a day and a day.

Workshops for postgraduate researchers by theme

The following workshops make up the core programme open to all postgraduate researchers, and are displayed by theme.

Research Planning and Management
- Managing your Research Project
- Practical Project Management for Research Students
- Viva Survivor
- Innovation School
- Managing your Research Data

Communication and Impact
- Designing Effective Slides
- Public Speaking, Networking and Engaging
- Poster Production
- Presenting made Easy – Presentation Techniques
- Presenting Made Easy – Delivering Presentations
- Presenting your Poster Pitch
- Research, Researchers and the Media, a hands on approach to communicating your research

Writing and Publishing
- Academic writing peer review
- Beating Writers Block
- Developing a Writing and Publishing Strategy in the Internet Age
- Effective Writing: Grammar
- How to be your own best editor
- Is my writing ‘Academic’ Enough?
- Just Write
- Proof Reading
- Text, Coherence, Structure and Argumentation
- The Writing Process: Getting Started
- Writing a Literature Review
- Writing Abstracts
- Writing Clinic
- Writing for Publication
- Writing Retreat
- Writing Well: Language and Style
- Academic Writer – Creative Writer
- An Introduction to Copyright and Publishing
- This is what I do… and this is why it matters

Digital and Library Skills
- Beginners Guide to Imaging
- Searching Literature and Managing Bibliographies
- Managing a Bibliography in Endnote
- Finding Academic Literature
- Social media for impact: strategy, connecting & metrics

**Statistics**
- Statistical Consultancy 1:1 Session
- Introductory Statistics for Life Scientists

**Personal Effectiveness**
- Conference and Events Organising
- Creating Effective Collaboration
- Creative Problem Solving for Researchers
- Imposter Syndrome: Why Successful people often feel like frauds
- Ease the Load – Feel good about your busy life
- How to be an Effective Researcher
- Mapping your Mind
- Seven Secrets of a Highly Successful Research Student
- Simply Assertive
- Speed Reading
- Teambuilding and Leadership Fundamentals
- Think Strategically Respond Rapidly
- Managing your Work, your Goals and Yourself

**Public Engagement**
- Communications Toolkit for a Public Audience
- Dialogue: Public Engagement Beyond Public Lectures!
- Storytelling Techniques for Effective Communication
- Voice and Presentation Skills Workshop
- How to Design a Public Engagement Process
- Facilitation skills for public engagement
- An Introduction to Public Engagement

**Online learning**
PhD student online training courses (topics include statistics; imaging; academic writing; and data management). Some you can do any time, and others run at specific times of the year.

- Statistics courses
- Imaging for scientists
- Academic writing
- Research Ethics and Integrity - an introduction
- Data management training
- Ready to research

The Edinburgh Local GRADschool is open to all PhD students in their final or penultimate year of study:

[www.ed.ac.uk/institute-academic-development/postgraduate/doctoal/courses/gradschool](http://www.ed.ac.uk/institute-academic-development/postgraduate/doctoal/courses/gradschool)
Advice on using social media networks & confidentiality of information

Facebook, Twitter and other social media networks have changed the way we interact with each other and like them or not, they are a part of our society.

As some of you will carry out research where animals are involved, please ensure that you follow procedures to ensure our work continues to be ethical, credible and professional. Sharing images/discussions of animal work outside of the context of academic discourse is not appropriate. This not only applies to posts on social network sites but to informal discussions in the pub or on the bus.

Please remember you must not post the following information:

- Scientific research information, analysis, results or any other information and/or images relating to your work.
- Location details of research buildings where animal work is carried out.

Be mindful of your responsibilities

- Data Protection legislation - do not disclose other people’s personal information without prior permission.
- Be aware that any posts you make in a professional capacity (even private posts) are subject to data protection and freedom of information and may need to be disclosed.
- University policies apply: Students must not post materials about their work and locations if doing so would carry a risk to themselves and especially to others, including the University as an organisation (see section 5 University policies).

www.ed.ac.uk/website-programme/training-support/guidelines/social-media
POGS
The IGMM Postgraduate Society (POGS) is a student-run committee open to IGMM students from all years and centres. Our aim is to improve the student experience at the IGMM, promote collaboration, provide support and have fun! By organising events throughout the year we bring students together, helping them develop skills and career perspectives. Our most popular events include the annual student retreat, Burns Night ceilidh, pub quiz, poster evening, and careers event. All students are welcome to take part so don’t hesitate to come say hi!

POGS is jointly funded by the IGMM and the Deanery, which means (almost) all of our events are completely free! Joining the POGS committee is a great way to get involved with the IGMM community, and have your say on how events are run. Meetings are held approximately once a month, and we are always looking for new committee members. To get involved, contact us at: igmm.pogs@ed.ac.uk.

Best wishes, POGS
The IGMM Social Committee

We are a group of students, research assistants and post-docs from across the IGMM who enjoy organising social events that are open to all at the institute. Our aim is to get everyone from the IGMM community together to unwind and have fun after work. We run many events, including the monthly TGIFs where we provide snacks and drinks in the nucleus on the last Friday of every month. Other highlights of the year include the IGMM Quiz, Christmas Party, Burns Night Ceilidh, and many more... We meet roughly once a month on an informal basis and you can be flexible with which events you help with. We are always looking for new members and being on the committee gives you an opportunity to work on your organisational and volunteering skills? great for your CV! If you have an idea for an event or you just want to help run our calendar, look out for our ?Join Social Committee? meeting coming soon. Alternatively, you could send us an email at social-comm@igmm.ed.ac.uk, or get in touch with one of our members.

You can find us and our current events schedule on the IGMM intranet.

We look forward to hearing from you!
Useful Links

GRADUATE RESEARCH & TRAINING HANDBOOK 2019
Useful links

General

College PG Office contacts
https://www.ed.ac.uk/medicine-vet-medicine/postgraduate/contact-us/

College PG research wiki (includes PG handbook, software available to students etc.)
http://edin.ac/2crLMTx

Code of Practice
https://www.ed.ac.uk/institute-academic-development/postgraduate/doctrnal/advice-support/regulations

Assessment regulations

Transferable skills training and support
www.ed.ac.uk/schools-departments/institute-academic-development/postgraduate/doctrnal

Ten simple rules collection- lots of extremely useful advice here in an easily digestible form, covering everything from being a graduate student to getting grants
www.ploscollections.org/article/browse/issue/info%3Adoi%2F10.1371%2Fissue.pcol.v03.i01

Searching the literature/bibliographic management

A tool for running daily searches
http://pubcrawler.gen.tcd.ie/

A free online alternative to Endnote and Reference Manager
www.zotero.org/

(note also that many journals have free apps for browsing abstracts).

Research Ethics

General
www.pnas.org/content/86/23/9053.full.pdf

Image manipulation
www.jci.org/articles/view/21717/pdf
www.cell.com/abstract/S0092-8674(06)00676-3
www.nature.com/ncb/journal/v6/n4/full/ncb0404-275.html
http://jcb.rupress.org/content/166/1/11.full

Writing papers, giving talks

Advice on writing papers
www.nature.com/nature/journal/v467/n7317/full/nj7317-873a.html

How to give a good talk

How to give a bad talk
www.sciencedirect.com/science/article/pii/S0960982299802929

Useful advice ranging from lab techniques to giving talks and posters
http://bitesizebio.com

The Advice Place, Potterrow Reception, EUSA 5/2 Bristo Square, Edinburgh EH8 9AJ
Tel: 0131 650 2656
https://www.eusa.ed.ac.uk/

Advice Guides and Resources

Here you can read all of our advice guides. If you would like them in an alternative format, please contact us and we will do our utmost to accommodate this.
MRC Human Genetics Unit
4 year programme
• Introduction to programme
• Projects available
• Rotation timeline
The first six months
The HGU PhD program is following an exciting and innovative format. You will spend the first 6 months on an intensive training period leading up to your final choice of PhD project. This period comprises taught courses, talks from individual group leaders about their work, teaching sessions on a variety of topics from technology to clinical research, journal club sessions which will give you a chance to hone your analytic and presentation skills, and 2 rotation projects. The detailed timetable can be found in the handbook.

The choice of rotation projects is up to you (available projects are listed at the end of this section) and you can approach any relevant group leader to discuss the projects. You will see that there is some time between rotations, giving you a chance to look around and choose a new lab. The only formal constraint is that you must spend time in 2 different labs. You may find, of course, that another student has already been accepted and that the PI is only willing to take on one student (as is normally expected of PIs). If this happens then try again in the next rotation period; if there is a real clash then Nick Gilbert will help but do please try and resolve things between yourselves in the first instance. Bear in mind that there is no formal requirement for you to choose a PhD project in a lab in which you have done a rotation project, the rotations are just a chance for you to try different labs and projects out.

Many of the group leaders welcome students coming to their lab meetings which is a good way of seeing life in labs other than the ones where you are doing rotation projects, but please be sure to make contact with the appropriate PI in advance.

The PhD
After 2 rotations you will choose a PhD project. We will have individual meetings with you to discuss your choices in the event of any clashes. No supervisor will be able to take on more than one student, HGU students must choose projects within the HGU, but apart from this you can go to any lab within the available project section. It is up to you to discuss possible projects with PIs you are interested in; this is a dynamic process in which you should be fully engaged. Note that supervisors are not obliged to take you on, you need to ask whether they are willing, or whether they have other interested students and so on. If your research project involves the use of animals or human participants, work must not commence until the relevant Home Office project and personal licences have been awarded, and appropriate Local Ethical Approval Committee has been granted. We will not be producing PhD project outlines from supervisors. Rather, at the PhD 10 week stage (June) you will have to produce a short report that outlines the project that you will pursue. This will then be discussed and refined if necessary by your supervisors (more detailed guidelines are given under Assessment Procedures).

You will then spend 3 years in the lab, winding up by April of your final year. You will then have a further 6 months to write up your thesis but remember it is imperative that you submit your thesis by the final university deadline of September of year 4!

We hope that this novel structure for PhD study will be as exciting for you as it has been for us to develop it. We will be asking for your feedback at several stages of the course - please feel free to air your views, and approach us about any issues you have, and help us to make the HGU PhD programme a huge success!

Nick Gilbert
Lab Rotations

Each student will do 2 rotation projects of around 3 months. Contact details and summaries of research interests of eligible supervisors are all given in this booklet (note there are some people unable to take students for rotations, please check), and during the first week you will be hearing research talks by some of these PIs.

The choice of rotation projects is up to you - you are responsible for approaching potential supervisors to discuss their willingness to take you on and to jointly come up with a plan of work. Remember the project won’t be formally assessed as part of your PhD, so make the most of your time to experience different techniques, and get a feel for life in different labs.

The only formal constraint is that you must spend time in 2 different labs. You may find, of course, that another student has already been accepted and that the PI is only willing to take on one student (as is normally expected of PIs). If this happens then try again in the next rotation period; if there is a real clash then one of us will intervene but do please try and resolve things between yourselves in the first instance. Bear in mind that there is no formal requirement for you to choose a PhD project in a lab in which you have done a rotation project, the rotations are just a chance for you to try labs out.

At the end of each rotation you have to write a report about your project, to be handed in by the end of the week after you finish in that lab. This should be in the format used by journals such as those on Biomedcentral, i.e. divided up into brief sections of background, results and conclusions and no longer than two sides of A4 (excluding figures).

This abstract should be submitted to the IGMM PGSC by emailing:

student.admin@igmm.ed.ac.uk

Supervisors will be asked for feedback on your performance in the lab and we will ask to meet up with you if there are any concerns. Towards the end of each rotation you will give a short assessed talk about your mini-project.
Chromosome Segregation in the Mouse Germline

Primary Supervisor: Dr Ian Adams

In mammals, genetic information is passed from generation to generation by germ cells. Errors in chromosome segregation are relatively common in human oocytes, particularly during meiosis, and cause genetic diseases such as Down syndrome in the next generation. These errors occur more frequently in oocytes from older mothers, but the reason for this age-dependent effect is not completely understood. You will use embryonic stem cells to investigate how pathways influencing chromosome segregation in mouse oocytes impact on chromosome-associated proteins. You will also use gene editing in mice to manipulate these pathways and exacerbate or ameliorate chromosome mis-segregation in meiotic oocytes.

Nuclear pores, heterochromatin organisation and cellular senescence

Primary Supervisor: Professor Wendy Bickmore

Cellular senescence permanently arrests proliferation in cells with persistent DNA damage. Cellular senescence contributes to organismal ageing. A striking feature of cellular senescence is a dramatic nuclear chromatin reorganization, with loss of heterochromatin away from the nuclear periphery and the appearance of internal senescence-associated heterochromatin foci (SAHF). This project will use a combination of super-resolution imaging, molecular and cell biology approaches to investigate the role of nuclear pores in driving heterochromatin away from the nuclear periphery during senescence and the influence that this has on the gene expression of senescent cells.
A dedicated Nonsense-mediated (NMD) pathway in the endoplasmic reticulum (ER-NMD)

Primary Supervisor: 
Professor Javier F. Caceres

NMD selectively degrades mRNAs harboring premature termination codons (PTCs) but also regulates the abundance of a large number of cellular RNAs. Most studies to date have focused on cytoplasmic NMD; however, we have recently uncovered evidence suggesting the existence of an NMD pathway dedicated to Endoplasmic Reticulum (ER)-localized mRNAs. We will define the subcellular localization of NMD for those transcripts that are translated at the ER, and will identify mRNA targets and novel components of the ER-NMD pathway. We will focus on the physiological role of this novel pathway, as well as on the biological consequences of manipulating its activity.

Functional genomic interrogation of trans-eQTL regulatory hubs and the role of functional epistasis in the development of large bowel cancer

Primary Supervisor: 
Professor Malcolm Dunlop

Colorectal cancer (CRC) is a common fatal cancer. Heritable common genetic variation influencing gene expression in normal large bowel epithelium contributes to CRC risk. We have generated a wealth of human functional and genomic data from blood, epithelium and tumour samples. This exciting project melds functional genomic analysis of trans-eQTL regulatory hubs with statistical genetic approaches to identify epistatic mechanisms influencing cancer risk. The candidate will gain computational and quantitative skills, alongside wet-lab expertise in genome editing to interrogate the functional genomic landscape of CRC risk. The ultimate aim is to prevent cancer by defining and exploiting cancer susceptibility pathways.
Understanding Gene Regulatory Networks Transitions in Early Eye Development
Primary Supervisor: Professor David FitzPatrick

In vertebrates eyes form from a group of cells in the neuroectoderm called the eye field. This process can now be efficiently modelled in organoids derived from embryonic stem cells. Our interest is in how expression of the eight mammalian eye field transcription factors (EFTF) is established and maintained. Many of the genes encoding the EFTF are mutated in human eye malformations. This project will map and perturb the cis-regulatory landscape around these genes to help understand both normal and abnormal human eye development.

Chemical tools to investigate 3D promoter structure
Primary Supervisor: Professor Nick Gilbert

In mammalian cells DNA is packaged up with proteins in a macromolecular complex called chromatin. Chromatin protects the DNA from damage but also controls the 3D folding of DNA to regulate processes such as gene transcription. Transcription starts at gene promoters, genomic elements that integrate molecular inputs and provides a suitable environment for protein binding. Although we have a good understanding of the protein components found at promoters we do not know the 3D structure. Successful candidates will work with the chemistry department to develop new small molecule cross-linkers that can be used as molecular probes to dissect the 3D structure of chromatin. You will then use these tools to generate the first 3D structure of a synthetic promoter.
Pinpointing genetic and epigenetic influences on adiposity
Primary Supervisor: Professor Chris Haley

There is variation between individuals in obesity-related traits. Our current research shows that epigenetic signals may complement genetic information in explaining such variation. This project will identify individual obesity-related loci that are the target of epigenetic modification. We will ask if the same loci contribute to both genetic and epigenetic effects on obesity and whether these signals act independently or through interactions. The project will use computational analyses of large scale population data on genomic and epigenetic variation in Scottish cohorts and thus will suit a student with an interest in computational, statistical or bioinformatic analyses of big data.

Chromatin Architecture, Enhancer Structure and Congenital Abnormalities
Primary Supervisor: Professor Bob Hill

Mutations which affect gene regulation are becoming increasingly recognised as important disease causing variations. A number of mechanisms perturb enhancer activity to generate abnormal phenotypes and we propose to investigate novel regulatory mechanisms that cause disease. Our model system for understanding abnormal gene regulation is the sonic hedgehog (Shh) gene, a signalling molecule that controls early development, and requires a genomic region of one million basepairs of DNA to regulate precise gene expression. To further elucidate mechanism, we will use CRISPR/Cas9 to engineer the chromosomal landscape for molecular analysis and to further develop imaging techniques to analyse chromatin structure.

Email: Bob.Hill@igmm.ed.ac.uk
Telephone: 651 8621
Combatting the enemy within: intracellular immune detection of genome instability to prevent cancer

Primary Supervisor: Professor Andrew Jackson

The cGAS-STING pathway senses cytoplasmic DNA to identify and combat microbial pathogens, while strict compartmentalisation of our own DNA in the nucleus prevents autoimmunity. We recently established that our own DNA can activate this pathway after DNA damage, when cGAS detects micronuclei. This has implications for how cells may detect early cancer-inducing events, and for how DNA damage could lead to inflammation (Mackenzie et al., Nature 2017). This PhD aims to build on these findings, addressing whether this pathway opposes cancer formation in vivo, if there are other processes that deliver DNA to the cytoplasm, and why cGAS is not activated during normal mitosis.

Next generation RNA genotype-phenotype mapping

Primary Supervisor: Dr Grzegorz Kudla

Genome sequencing has become relatively cheap, and close to a million people have had their genome sequenced. To interpret this massive amount of information, our lab develops efficient methods for measuring and predicting the effects of genetic variation. We synthesize large collections of mutated genes, and develop high-throughput assays to measure the effects of mutations on molecular and cellular phenotypes, such as protein and RNA abundance, protein-RNA interactions, and fitness (Puchta et al., Science, 2016). We use a variety of experimental techniques, including gene synthesis, next-generation sequencing, microarrays, and automated microscopy, and experimental systems including bacteria, yeast, and mammalian cells.
How do cancer mutations affect protein complexes?

Primary Supervisor: Dr Joe Marsh

Protein complex assembly is often dysregulated in cancer due to mutations that directly affect protein sequence or cause stoichiometric imbalances. This project will combine genomic and proteomic datasets with a variety of computational approaches, including structural bioinformatics, molecular modelling and machine learning, to systematically study the ways in which cancer-associated mutations affect protein complexes, and compare them to the genetic variation observed in humans and across evolution. The ultimate goal is to identify features of proteins and complexes that explain the phenotypic effects of mutations, and can be used to computationally predict cancer driver mutations from high-throughput sequencing data.

Epigenetic transitions in Development

Primary Supervisor: Professor Richard Meehan

Epigenetic modifications of histones and DNA in the cell nucleus are essential for embryo development by regulating active and repressive chromatin states that propagate gene activity patterns in cell lineages and regulate overall nuclear architecture and chromosome function. The appearance of nuclear condensed chromatin in mouse embryogenesis coincides with differentiation and a restriction in developmental potential but its causal involvement in these processes remains unclear.

We hypothesise that epigenetic repression pathways act in a three-dimensional and signalling context in the embryo, which are disrupted when embryonic stem cells are cultured in a dish. We will explore this using a variety of experimental and advanced imaging approaches.

Email: Richard.Meechan@igmm.ed.ac.uk
Telephone: 651 8548
Defining cell-type specific molecular repair signatures during therapeutic genome editing

Primary Supervisor: Dr Pleasantine Mill

The recent game-changer for genetic disease is the utilization of CRISPR technology for human genome editing, thus offering a possible cure for genetic diseases. There are, however, sizeable obstacles to making this a therapeutic reality, including (a) targeted delivery of editing machinery and (b) improving repair efficiency.

To fast-track solutions to these problems, we developed powerful fluorescent reporter mouse models, allowing sensitive read-outs of genome-editing. In this studentship, you will determine whether differences in DNA repair pathways exist in different cell types and/or at different stages of differentiation, and whether these change with different delivery systems. You will help determine the most effective formulation for establishing therapeutically-beneficial editing in vivo.

Email: Pleasantine.Mill@ed.ac.uk
Telephone: 651 8616

ALDH function in the melanoma

Primary Supervisor: Dr Liz Patton

A striking discovery in the past decade is that somatic and cancer stem cells express high levels of ALDH activity. In particular, ALDH1 enzymes mark a discrete subpopulation of cells in melanoma and other cancers that are enriched for tumor initiation potential, and following cancer therapy. This PhD project will use single cell technologies and state-of-the-art live imaging in the zebrafish system to understand the genes that regulate ALDH(High) cells, and to follow the fate of these cells during melanoma initiation, progression and recurrence following therapy. Ultimately, we aim to target these cell types as a novel therapeutic approach in melanoma.

Email: E.Patton@igmm.ed.ac.uk
Telephone: 651 8536
**Identifying rare large-effect variants in isolate populations**

**Quantitative Trait Loci (QTL)**

This project will use computational approaches to identify rare variants affecting traits at the level of the phenotype and intermediate metabolism (e.g. proteome, metabolome, methylome) in isolate populations from Scotland and Croatia. Our long-term projects in these populations provide a wealth of health-related and other trait data. Using genome–wide SNP data with exome and whole-genome sequence data the project will identify rare variants with large effects that are at enhanced frequency in these populations. With the possibility of functional studies of promising variants, this project offers exceptional students the opportunity to develop both computational and laboratory skills at the cutting edge of genomics.

**Email:** Chris.Haley@igmm.ed.ac.uk  
**Telephone:** 651 8506

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**Genome-scale inference of causal molecular mechanisms of complex diseases & traits**

**Primary Supervisor:**  
Professor Chris Ponting

Most of the human genome is associated with an anthropomorphic trait or disorder. A large minority of the human genome is also known to bind transcription factors in different cellular contexts. But what molecular mechanisms are dysregulated in disease and trait variation? Spanning this gulf is essential for efficient and cost-effective drug target discovery. This project addresses a Grand Challenge of 21st Century Biology: how to assign causality across the entire human genome to molecular phenomena that explain disease risk. For example, predicting that a change in binding affinity of a factor to a specific site alters disease susceptibility.

This project would best suit an individual with a numerical and analytical background (physics, computer science, mathematics etc) or a numerate biologist. Required training will be provided.

**Email:** Chris.Ponting@igmm.ed.ac.uk  
**Telephone:** 651 8506

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Using synthetic biology to understand how the epigenome is programmed in cancer
Primary Supervisor: Dr Duncan Sproul

Epigenetic dysfunction is a fundamental hallmark of cancer that results in altered DNA methylation levels. It is associated with the repression of tumour suppressor genes such as BRCA1 but we don’t understand how these potential epimutations occur. We have recently developed synthetic epialleles, manufactured DNA with defined DNA methylation levels. This project will use these tools to probe how the cancer epigenome is programmed and identify the factors responsible for DNA methylation alterations in cancers. The student will become an expert in cutting-edge laboratory techniques including CRISPR genome and epigenome editing and gain experience in bioinformatics.

Email: D.Sproul@ed.ac.uk
Telephone: 651 8628

The blind watch breaker: mutation and selection at regulatory sites in cancer
Primary Supervisor: Professor Martin Taylor / Professor Colin Semple

Using novel computational approaches we have discovered unexpectedly high mutational loads at active regulatory sites in most cancers, relative to matched control sites (Kaiser et al, 2016; Kaiser and Semple, 2018). This results in the genome-wide accumulation of variants predicted to degrade transcription factor binding, and drive widespread effects on gene expression. We have access to rapidly increasing numbers of whole genome sequenced tumour samples, providing exciting new opportunities to study the consequences of mutated regulatory sites, and to better discriminate variants under selection (and driving tumourigenesis) from selectively neutral mutational bias.

Email: martin.taylor@igmm.ed.ac.uk & colin.semple@igmm.ed.ac.uk
Telephone: 651 8613 (M. Taylor) & 651 8614 (C. Semple)
Cutting-edge scalable computational tools for the genetic analysis of longitudinal phenotypes to understand disease aetiology

Primary Supervisor: Professor Albert Tenesa

Most human characteristics change over time. By recording them repeatedly we can obtain trajectories of these changes. Currently, most studies of the genetic factors underlying human disease only consider these characteristics at a single time point and ignore how genetics affect the pattern of change, which would likely be a better prognostic measure of disease.

However, there are no analytical and computational tools that can perform such complex statistical analyses in very large studies to make meaningful epidemiological inferences. The project will aim to develop and apply these tools for the analyses of large-scale cohorts such as UK Biobank.

Uncovering longitudinal trajectories in molecular and clinical population data

Primary Supervisor: Dr Catalina Vallejos

Large population cohorts typically collect high-dimensional molecular data at a single time-point per subject. We will use pseudotime machine learning approaches to approximate longitudinal molecular trajectories from cross-sectional data, and explore extensions to jointly uncover molecular and clinical disease progression trajectories, incorporating electronic health records. For example, do pseudotime DNA methylation trajectories predict health outcomes such as stroke/cancer/dementia? Our methods will be applied to Generation Scotland (generationscotland.org), but are also highly relevant for other cohorts with linked molecular and clinical information.

This project would suit a motivated student with statistics, data science, machine learning, bioinformatics or related backgrounds.
How chromatin structure affects genome editing and DNA repair

Primary Supervisor: Dr Andrew Wood

Genome editing tools such as CRISPR-Cas9 allow the genetic code to be rewritten inside living cells. In order to edit DNA, Cas9 must first identify the target site and break the double helix, after which sequence edits are introduced during the repair process. This project will investigate how chromatin structure, which controls the accessibility of chromosomal DNA to Cas9 and DNA repair factors, affects the efficiency of genome editing, the frequency of unwanted off-target mutations, and the outcome of DNA repair.

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Training Timeline 2019 - 2020

- **September 2019**
  - COLLEGE/IGMM INDUCTIONS
    - Week Beginning 9th September

- **January 2020**
  - ROTATION 1
    - 16th September - 20th December
  - CHOOSING / START PhD
    - Start 6th April

- **April 2020**
  - ROTATION 2
    - 6th January - 3rd April
Student Health and Wellbeing
Resources provided or recommended by the University of Edinburgh

**Student Disability Service**
Supports students with a range of health conditions, learning differences, disabilities and some temporary injuries.
www.ed.ac.uk/student-disability-service

**Student Counselling Service**
Supports the mental health of all students at the University through short term counselling and referral to other support.
www.ed.ac.uk/student-counselling

**Chaplaincy**
The Chaplaincy is a safe and welcoming space for people of all faiths and none.
www.ed.ac.uk/chaplaincy

**University Health Centre**
NHS General Practitioners who rent premises from the University and offer full G.P. services to patients.
www.health-service.ed.ac.uk

**Advice Place**
Professional, impartial and inclusive service for all students at the University of Edinburgh.
www.eusa.ed.ac.uk/support_and_advice/the_advice_place/

**EUSA Mental Health and Wellbeing Society**
Provides an informal and friendly space where students can learn more about the importance of mental wellbeing.
www.eusa.ed.ac.uk/activities/societies/society/edinburghwellsoc

**Feeling Good App**
The Foundation for Positive Mental Health is Working with the University of Edinburgh to provide free access to the Feeling Good App.
www.ed.ac.uk/sport-exercise/healthy-university/feeling-good-app

**Big White Wall**
An online service offering self-help programmes, creative outlets and a peer support community monitored by mental health professionals.
www.bigwhitewall.com

If you would like to discuss student health and wellbeing or any of the resources above, please contact: student-admin@igmm.ed.ac.uk
A study by the University of California, Berkeley, found nearly half of postgraduate students met criteria to classify them as depressed.1

**WHAT YOU MAY BE EXPERIENCING/FEELING (YOU ARE NOT ALONE, I PROMISE)**

### IMPOSTER SYNDROME

7 in 10 people experience impostor syndrome throughout their careers.2 Someone is going to figure out you don’t belong here soon. You look good on paper, but passing that exam was a fluke. I don’t have what it takes to do these experiments, write a thesis, succeed in academia. These are all classic signs of impostor syndrome. Tip: redefine your thinking. Aim for progress, not perfection.

### FIRST TIME FAILING

You’ve always been the best student at school, and you did pretty well at university too. Now your science isn’t working and everyone around you seems to be getting on just fine. These feelings can come about as it happens at undergraduate level, experiments (believe it or not) are designed to work. Tip: remember, you are at the forefront of scientific research - if it was easy it would already have been done!

### ISOLATION / GUILT

Writing your thesis can be a particularly lonely, isolating task. This can also be coupled with feelings of guilt when going about your daily life as “you should be writing”. Tips to manage this include still attending research group meetings/departmental seminars whilst writing. This can also be coupled with “writer’s block”. Tip: when writing, start by making figures - it is far easier to write about what a figure means.

### COMPETITIVE LANDSCAPE

Unfortunately, academia often fosters competition over collaboration, when it should be the other way around. This is made worse by the fact that often the only way to gauge how well you are doing is to compare yourself against others. Tip: no two PhD projects are the same, so avoid comparing them.

### THE WORK | LIFE STRUGGLE

There is an inherent culture of acceptance in academia of long work hours. In fact, 40% of academics report working more than 50 hours a week.4 This is a fault with the system. Presenteeism is a common trait observed in academia, where people work long hours due to anxiety/stress, but are not being efficient in these long hours. Tip: aim to be efficient inside normal working hours then focus on “you” time.

### NO MORE TICK BOXES

You got pretty good at doing essay and lab reports - they were all short term tasks. You also got good at figuring out what questions might be asked in exams. Now you have an open ended project, with no end and no where in sight. You no longer have grades to tell you if you are doing a good job. Transitioning from this undergraduate mentality can be particularly tough. Tip: break down your research into small, manageable goals.

### DECREASED LONG HOURS

Working

They are the same. So avoid comparing them.

### INCREASED WORKING

First time failing

You’ve always been the best student at school, and you did pretty well at university too. Now your science isn’t working and everyone around you seems to be getting on just fine. These feelings can come about as it happens at undergraduate level, experiments (believe it or not) are designed to work. Tip: remember, you are at the forefront of scientific research - if it was easy it would already have been done!

### MENTAL HEALTH

**ARE THOSE AROUND YOU STRUGGLING? HERE ARE SOME POSSIBLE WARNING SIGNS**

- Increased drinking
- Increased eating
- Decreased eating
- Working long hours
- Being absent
- Joking about suicide
- Looking dishevelled
- Suicidal thoughts?
- Self-harming?
- Call Samaritans now on 116-123 or email jo@samaritans.org

**SOME WAYS TO HELP MANAGE YOUR MENTAL HEALTH AND WELLBEING**

- Seek medical advice
- Take some time out
- Talk to your supervisor
- Focus on you
- Request counselling
- Talk to your peers / postdocs
- Create manageable chunks
- Read literature

**REFERENCES**

5. First time failing

A poster by Dr Zoe Ayres (not a medical professional). Free to distribute.
A new Facebook Group has been created for current on-programme students at IGMM. This online space is a closed group and has been created specifically for students (not staff) for announcements, course materials, discussions and a place to get to know each other.

Join by searching Facebook for OFFICIAL IGMM Students or visiting: www.facebook.com/groups/OFFICIALIGMMStudents

Do I have to join the group?
Yes. We hope the group will make life easier for everyone by having all the right information and people in the same place, reducing email traffic and providing a place for resources, questions and answers.

What if I’m not on Facebook or don’t want to use my personal profile to join?
That’s ok – contact us and we can help you set up a new profile, just for life at IGMM.

What is a closed group?
Only approved members of the group can see who the current members are and view posts in the group.

Anyone on Facebook can see the group’s name and description, find it through search and request to join (requests are approved or declined by Administrators), but they can’t see any of the content or members.

Who will be in the group and who moderates it?
All postgraduate students on programme at IGMM.

Pauline and Alana are the Group Administrators with the Communications Manager as Moderator. Look out for group announcements from the Administrators – these flag key information. Join requests are approved by the Administrators, so no ‘outsiders’ will be able to join the group.

Can we say what we want?
Although this is your group, remember that the group represents the Institute and we expect members to behave as professionally as they would in person on campus. Inappropriate posts will be moderated and removed.