Teaching through discussion – active learning approaches of postgraduate training programmes

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Active learning for PG students

Weekly discussion groups hosted by group leaders

For postgraduate students on

- Wellcome Trust 4-year PhD programme
- CRM PhD programme
- MSc by Research in Regenerative Medicine and Tissue Repair
Discussion Groups

- **In-depth discussions** of research papers on range of biomedical topics
- Broaden the student’s **scientific knowledge and critical thinking**
- Introduce students to **breath of research topics in labs** of supervisors
- Combined **independent and directed learning**
- Support **cohort-building** and enhance student-experience
Formats

- Informal setting
- Papers (~2) circulated 1 week in advance to prepare
- Brief overview of the research in host’s lab
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**Present & discuss**

- Students **discuss a paper in small groups**, then present to other groups
- Students **present papers/figures to peers**, followed by group discussion
- **Host presents papers**, followed by group discussion
- **Slides** of key figures helpful
Formats

Questions-led

- Students prepare & present answers to Qs posed by host, to the group
- Qs can be about e.g. the methods (pros/cons), the biological concepts, implications of the findings for the wider research field or future research
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Peer review

- Students act as peer-reviewers of a pre-published manuscript and then **compare this with the published version**
- Students review **papers from preprint servers (eg BioRxiv)** and prepare constructive feedback to send to the authors
Outcomes

Knowledge

Skills

Reflection

Social
Knowledge

- **Fundamental principles** in relevant topics
- Variety of **scientific concepts**
- Review of the diverse **techniques, models systems and approaches** applied in their field
Skills

• Scientific reasoning
• Master critical assessment of research papers
• Effective communication of findings to peers and experts
• Relevant contributions to group discussions
Reflection

• Work with supervisors to **discuss research projects**
• Reflect on personal **research interests** and career direction
• Develop their own, unique inter-disciplinary **PhD research proposal**
  (with guidance from their prospective supervisor)
Social

• Opportunity to regularly **meet and work with peers** while undertaking rotations at different labs across the campus / centre

• **Build a network** of researcher contacts and peers

• **Share and learn together** as a cohort
Feedback - students

• The best number of papers is 2, one research article and one review for background information to aid discussion (‘..allows time to dissect results and methodologies and diverge, making it stimulating and interesting’)

• The review provides essential background as many areas are new

• Papers were particularly good if they were either a seminal paper in the field, a very modern paper where to discuss the latest in the field or a technical paper to discuss the intricacies of the work

• Papers with things wrong which could be dissected and criticised were also good
Feedback - students

• ‘One person going through a figure, but opening up points for discussion to the wider group improved the amount and quality of discussion as well as being a valuable opportunity to appreciate other people’s thought process/perspective on a particular problem/question, which no doubt helps when approaching new problems in the future’.

• ‘Having 2 papers and an open, guided format allows you to think more deeply about a particular research area and the Qs posed within it, which I would argue, generates more imaginative and creative thinking/problem solving.’
Feedback - authors

• ‘First off, thank you for sending these questions over! It’s actually a refreshing aspect of BioRxiv that we can get constructive questions and comments before our work is entirely complete’.

• ‘I shared your questions with John, and the following answers are from both of us (but actually almost entirely John’s). I hope they help, and please pass on our thanks to your group.’

• ‘We thank .. the students of the Tissue Repair PhD programme at the University of Edinburgh for critically reading the manuscript’ – Acknowledgement in https://doi.org/10.1016/j.devcel.2015.01.001
Value for students and University

Discussion Groups contribute towards strategic aims of UofE:

- Offer inspiring and challenging **educational experiences**
- Develop opportunities for **experiential learning** on campus
- Educate the **next generation of leaders** and influencers
- Enable our students to **fulfil their full potential**
- Ensure that our degree **programmes remain current**
- Ensure that graduates are equipped with the **abilities and skills employers need**
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