

FACULTY OF LIFE SCIENCES

DIVISION OF BIOSCIENCES

DEPARTMENT OF STRUCTURAL AND MOLECULAR BIOLOGY



Year 3 research project student-led inquiry labs with productive failure

Dr. Renée Vancraenenbroeck & Dr. Amanda Cain

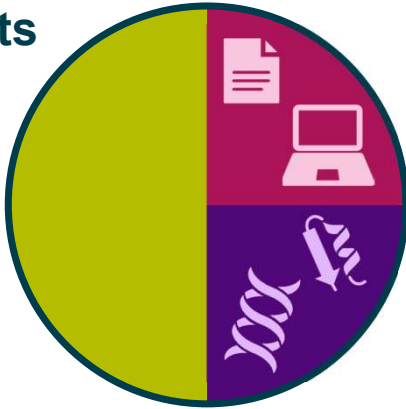
FEBS, Evolving Molecular Biosciences Education, Manchester, 2023



BURSARY

Year 3 Biochemistry BSc / MSci degree

120
credits



Literature Review Project in Molecular Biosciences (BIOC0021)

Specialist Research Project in

Course-based undergraduate
research experience

Scalability and standardization

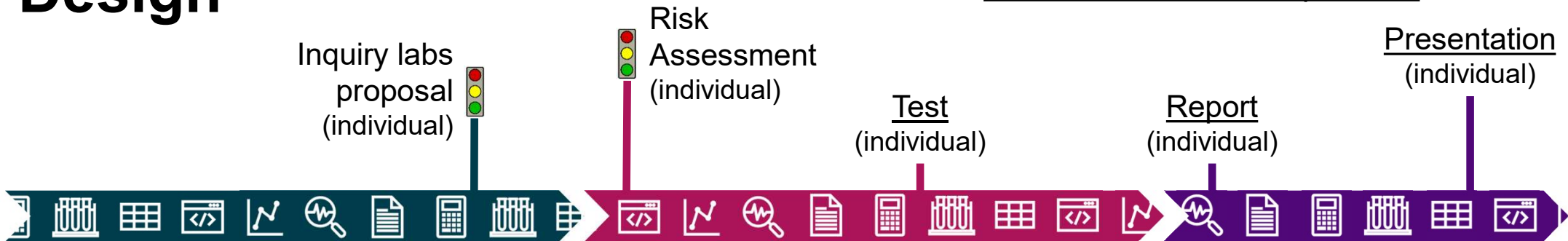
80-100 students

Metagenomics (BIOC0023)

**Protein Structure and Function
(BIOC0029)**

20-30 students

Design



Three assessment components:

Term 1 (Oct-Dec, 10 weeks)

Orientation

- Learning lab techniques and data analysis
- Writing own protocols from provided selected papers and manufacturer's manuals through guided groupwork in tutorials
- Testing protocols and getting acquainted with lab set-up and safety

Term 2 (Jan-Mar, 10 weeks)

Inquiry: *reproduce, modify, or build on existing, self-chosen, peer-reviewed research (individual)*

- Gaining hands-on insights into real-life aspects of design, planning, testing, failure and troubleshooting, and reproducibility (= *the process of science*)
- Helping and learning from others through sharing experiences, setbacks, and successes

Term 3 (Apr-Jun, 7 weeks)

Report and presentation marking:

focussed on process, not results

Goals, and challenges

Student-led inquiry labs after orientation labs

- Catering for different levels of prior knowledge
- Acquiring research-based skills
- Giving autonomy and building a sense of ownership

Encountering failure and troubleshooting

- Encouraging creativity, exploration, and iteration
- Focussing on a growth mindset by providing an environment where failure is seen as a learning experience

Groupwork and sharing experiences with peers and staff

- Fostering a community and creating a sense of belonging
- Appreciating the role of peer support on emotional well-being and performance

Challenges

Physical space, time, and equipment needed; budgeting and delivery delays for chemicals; staff workload; students finding Python difficult to learn

More information

Year 3 research project student-led inquiry labs with productive failure
 Dr. Renée Vanraanenbroeck and Dr. Ananda Cain
 University College London, Faculty of Life Sciences, Division of Biosciences, Department of Structural and Molecular Biology

1. BACKGROUND

Literature Review Project in Molecular Biosciences (BIO0021) is a 20-credit research project and is a 10-week laboratory-based research experience. This course-based research project requires the students to explore research projects in their target research area and create uniformity, consistency, and quality with the teaching.

Students can choose between "Specialist Project Project in Immunogenetics (BIO0022)" and "Specialist Project Project in Protein Structure and Function (BIO0029)". This year, in BIO0029, we introduced orientation and inquiry labs.

2. DESIGN

Inquiry lab process (10 weeks):
 1. Learning lab techniques and data analysis (1 week) and how these can be applied to answer various questions about proteins.
 2. Writing an abstract from provided template.
 3. Submitting abstracts to the supervisor.
 4. Testing protocols and getting acquainted with lab.
 5. Collecting and analysing data (1 week) and safety data sheets and risk assessments.

Time assessment components:
 1. Report on their own research (1 week)
 2. Report on their own research (1 week)
 3. Report on their own research (1 week)
 4. Report on their own research (1 week)

3. CYTOCHROME C

4. GOALS, TIPS, AND CHALLENGES

REFERENCES

CONTACT DETAILS

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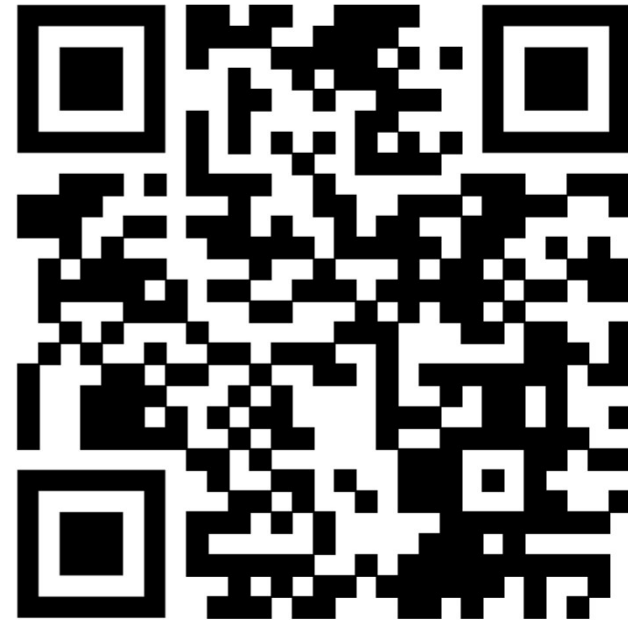
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PDF of poster
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