High School Teacher Professional Development Workshop 1 – Genetics and Gel Electrophoresis

8:30 am - 3:00 pm, Monday 21 October 2019

Overview

This one-day workshop empowers teachers to conduct hands-on genetics activities in their classrooms. It is targeted at Year 11 and 12 biology teachers and Years 7 to 10 science teachers, and will take place at our world-class medical research facility in Herston, Brisbane. Join fellow science-teaching professionals, meet research scientists, and get experience in laboratory techniques you can use in the classroom. Along the way, you will road-test relevant literacy tools, critique the benefits of different laboratory activities, and tour our research facilities.

Expected Outcomes

During this workshop, teachers will:

• Conduct benchtop experiments in microbiology:
  ○ Learn how to make media that can be used for classroom activities in genetics (eg. agarose gel)
  ○ Trial and critique three methods for DNA extraction
  ○ Hone skills in micropipetting
• Critique the practicality of conducting gel electrophoresis activities in school laboratories, and troubleshoot potential problems
• Meet and interview a medical researcher to complement in-class learning of the Science as a Human Endeavour strand of the Australian Curriculum Science
• Road-test literacy activities to support in-class learning in cell biology, infectious diseases and beyond
• Receive relevant information from suppliers of equipment and consumables, facilitating your ability to translate your learning into hands-on activities in your classroom.

Relevance to professional practice

AITSL Professional Standards for Teachers

• AITSL Standard 2: Know the content and how to teach it
• AITSL Standard 3: Plan for and implement effective teaching and learning
• AITSL Standard 6: Engage in professional learning
• AITSL Standard 7: Engage professionally with colleagues, parent/carers and the community.
### Australian Curriculum Science
- Science Understanding: Year 8 (cell biology) and Year 10 (genetics)
- Science as a Human Endeavour: Year 8 (occupations, ethics), Year 10 (technological advances, publishing and review)
- Science Inquiry Skills: All years.

### Queensland Senior Syllabus for Biology (2019)
- Unit 1: Cells and multicellular organisms (both topics)
- Unit 4: Heredity and continuity of life (Topic 1: DNA, genes and the continuity of life).

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<tr>
<th>TIME</th>
<th>DETAILS</th>
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<tbody>
<tr>
<td>8:30 am</td>
<td>Arrive and sign in</td>
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<tr>
<td>8:40 am</td>
<td>Introduction to the Lab and safety talk</td>
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| 9:00 am  | Genetics workshop: DNA structure and re-structure  
  - Compare and critique three DNA extraction methods                                                                                           |
| 10:30 am | Morning tea (provided) with QIMR Berghofer science ambassadors                                                                                                                                          |
| 11:00 am | Tour of QIMR Berghofer research facilities                                                                                                                                                              |
| 11:45 am | Genetics workshop (cont.)  
  - Pipetting  
  - Prepare agarose gels for gel electrophoresis  
  - Run gel electrophoresis                                                                                                                 |
| 1:00 pm  | Lunch (provided)  
  Peruse equipment and consumables relevant to Biology units of the Australian Curriculum Science, and to Units 1, 2 and 4 of the Queensland Biology Senior Syllabus |
| 1:30 pm  | Infectious disease workshop (cont.)  
  - Mock ELISA for diagnosing Ross River Virus                                                                                                  |
| 2:00 pm  | Meet the scientist  
  - a presentation and discussion with QIMR Berghofer genomicist, Dr Nic Waddell                                                                                                           |
| 2:30 pm  | Tour of DNA sequencing facility                                                                                                                                                                          |
| 2:50 pm  | Feedback and evaluation                                                                                                                                                                                |

Register online at www.qimrberghofer.edu.au/students/school-students/teachers/

Or contact the QIMR Berghofer school education coordinators – schools@qimrberghofer.edu.au
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