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Co-creating inclusive transition pathways for widening participation applicants in Biosciences

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In today's talk

1. Introduction
2. The project
3. Results
4. Conclusions

Introduction

- The **Mini Degree Module (MDAS)** provides applicants from Widening Participation (WP) backgrounds with early experience of university-level study
- Our project developed a **Biosciences-specific MDAS module**
- **Co-created with final-year students** as part of their educational research projects.
- Designed to be **accessible and inclusive**

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Our approach

- Used Huntington's disease as a narrative case study
- Course mirrors key first-year content across different units
- Students will gain experience of the digital learning environment used in SBS, including:
  - Canvas course structure and navigation
  - Lecture-style materials and short videos
  - Interactive tools (e.g. Padlet, quizzes)
  - Year 1-style assessment formats

Course aims

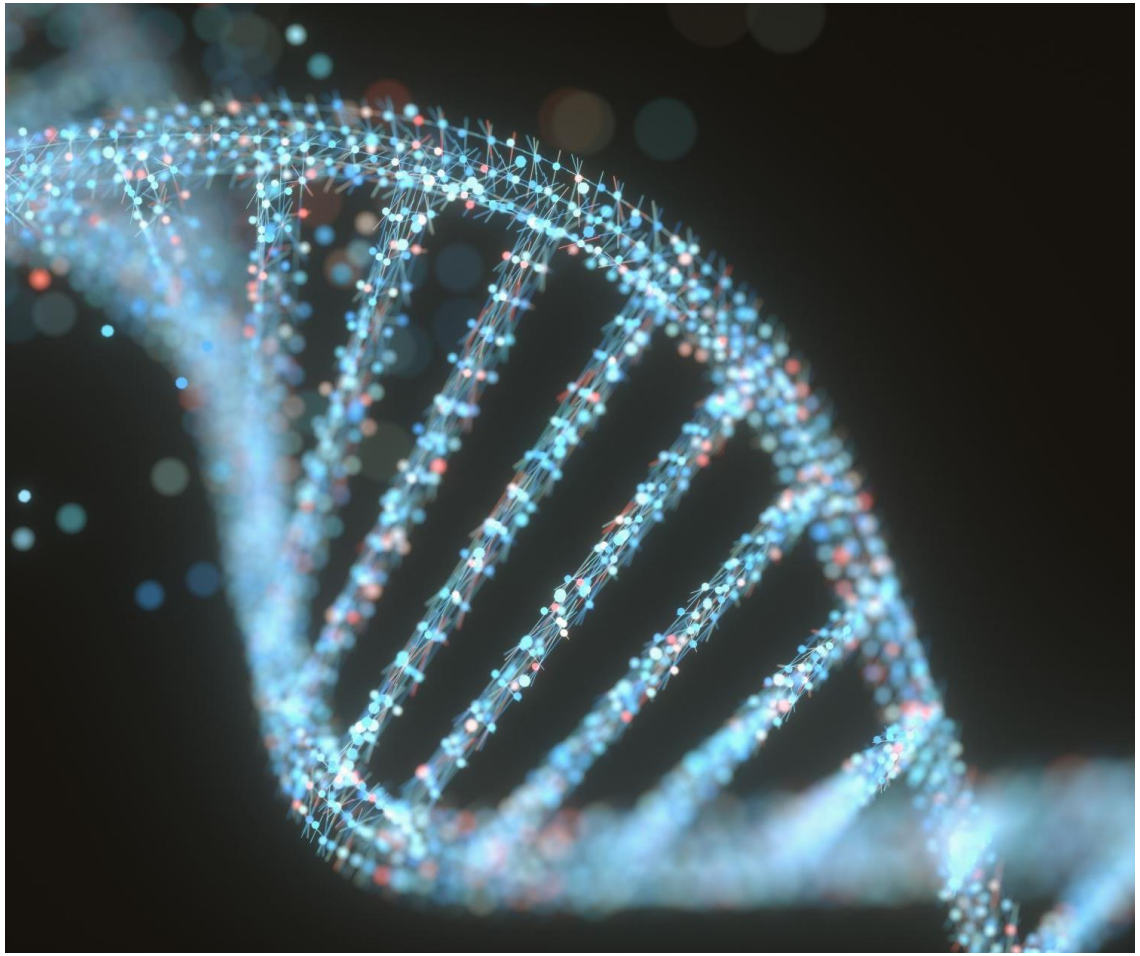
- Introduce core concepts from **biochemistry, cell biology and neuroscience** using Huntington's disease as a unifying case study.
- Develop understanding of how **genetic changes lead to molecular, cellular and neurological disease**.
- Begin developing students' ability to **interpret scientific evidence and think critically about research**, including its strengths and limitations.

- Support early engagement with **university-level biological sciences content** drawn from first-year units in the School of Biological Sciences.
- Provide experience of **university learning and assessment practices**, including digital learning tools, quizzes and scientific reading.
- Support students from **Widening Participation (WP) backgrounds** in building confidence and preparedness for undergraduate study.

Course organisation

Course is organised in 4 parts:

1. From DNA to mutant Huntingtin (*genetics*)
2. From misfolded protein to cell dysfunction (*cell biology*)
3. From cell dysfunction to disease (*neuroscience*)
4. From research to treatment (*therapy*)



Course organisation

Each part includes:

- Introduction and ILOs
- A glossary to support new terminology
- Short, manageable learning pages
- Videos and lecture-style content
- Interactive activities and quizzes
- Quizzes similar to Year 1 assessments

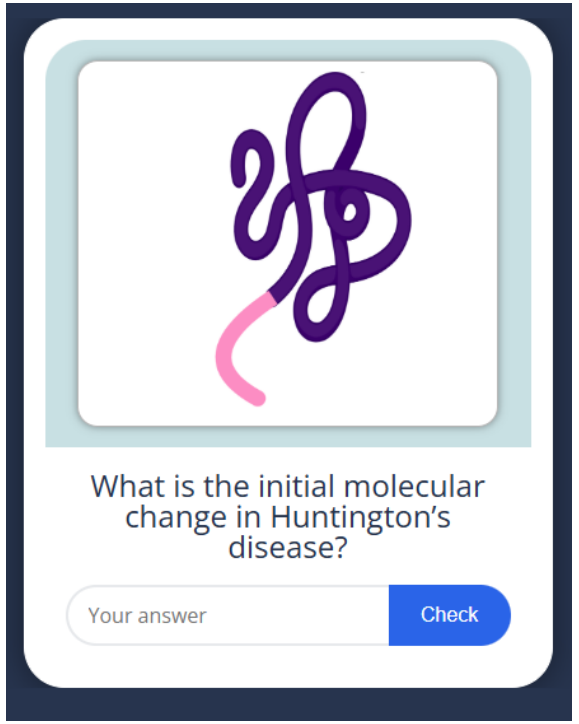
Learning activities

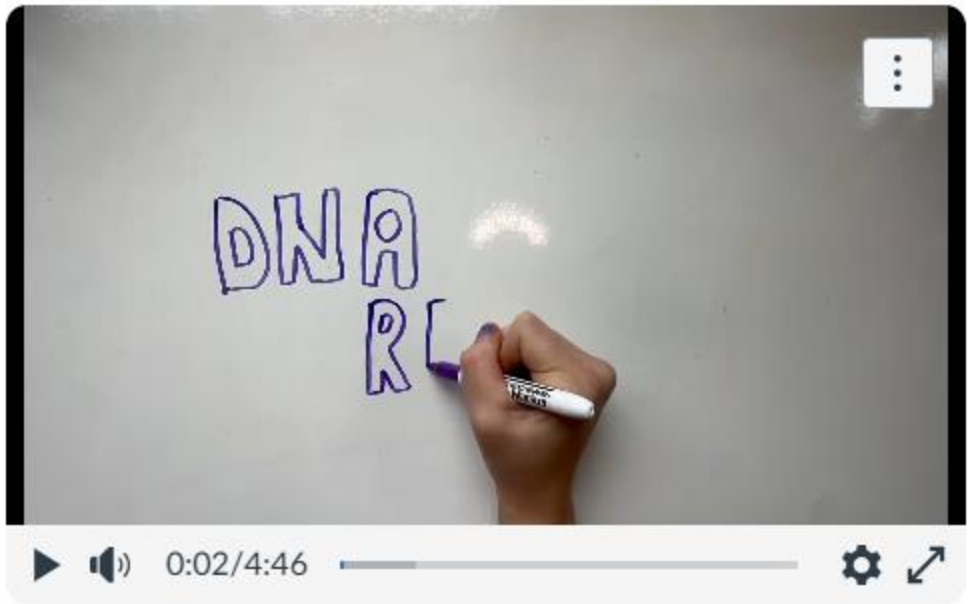
Activity

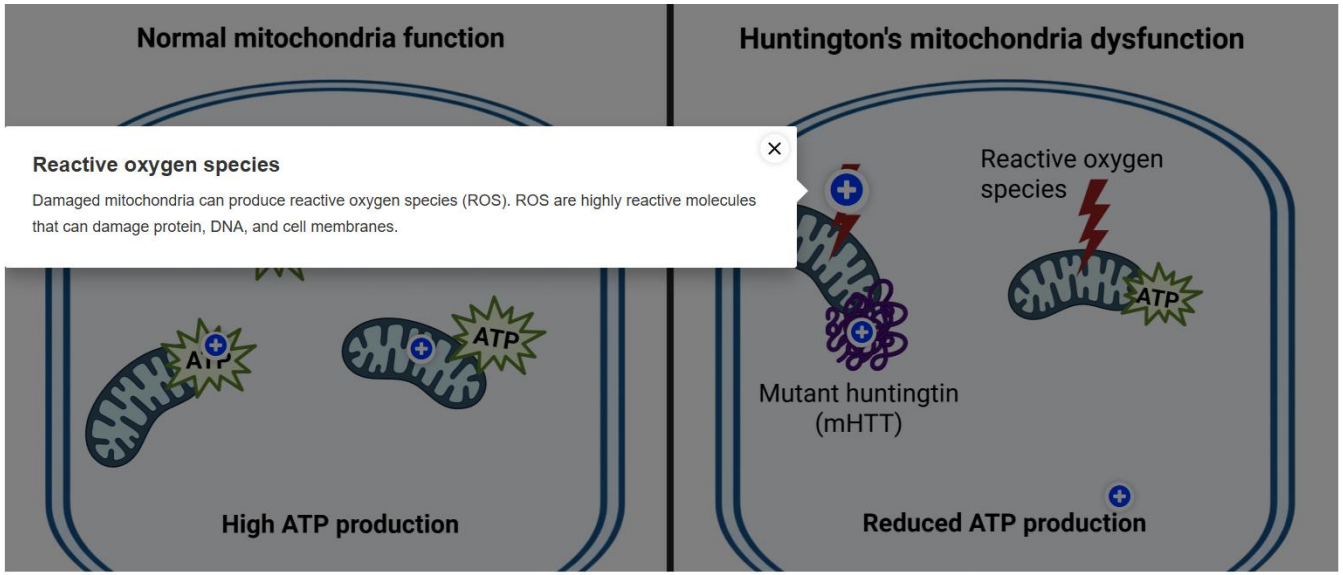
Please drag the words into the correct boxes

The neocortex is a [ ] layered structure in the human brain that can be divided into the parietal, [ ], temporal and frontal lobes. Below the neocortex is the cerebellum which coordinates aspects of [ ], and the brain stem which is critical in maintaining [ ] function. Deep within the brain is the hypothalamus and the thalamus which are located within the [ ]. The thalamus acts as a relay station for [ ] information and the hypothalamus maintains [ ] in bodily functions like temperature control and hunger. The [ ] is located in the forebrain, this structure ensures movements are smooth and controlled and regulates habit and reward behaviours.

- six
- movement
- basal ganglia
- occipital
- balance
- autonomic
- diencephalon
- sensory







Introduction to scientific literature and critical thinking

🎓 Your task

This short activity is designed to give you a **taster** of what it means to think critically about a scientific report.

👉 **Please read the article carefully.** Click here to access the article.

👉 Then **complete the short quiz** (10 questions) that follows

Students given short scientific paper to read, then asked to complete quiz, testing understanding of:

- Key study findings
- Limitations of research
- Why caution is needed when interpreting early clinical trial results

🧠 Critical thinking pause – What could this mean for the future?

If confirmed:

- First treatment to slow Huntington's disease.
- Gene therapy may work for other brain diseases.
- Raises questions about cost, access and ethics.

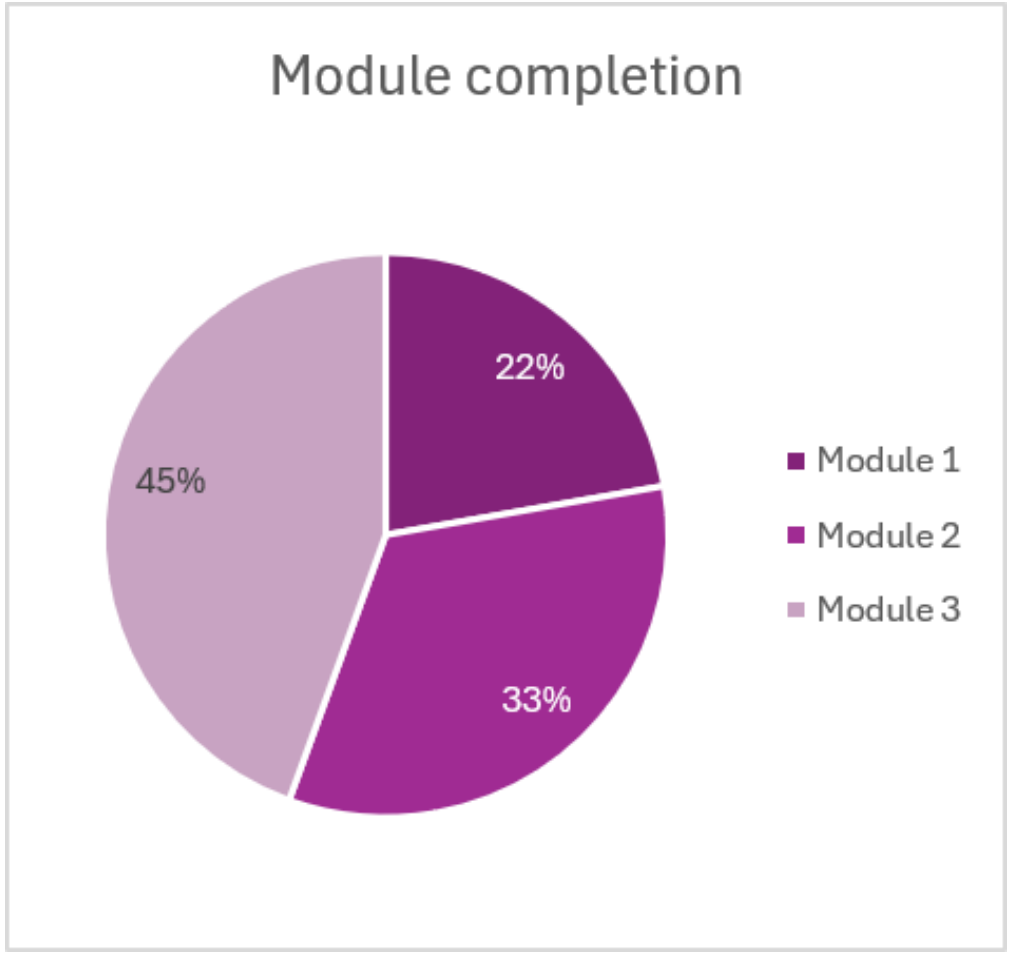
Gene therapies can cost **over £1 million per patient**, so health systems must decide:

- Who gets access?
- Is it cost-effective?
- How do we ensure fairness?

Students asked to consider ethics of expensive gene therapy

3. Results

- Feedback survey completed by 18 students (50% students were at A-level, 50% different levels UG and/or graduates)
- Students completed one module of the course only (approx. 2h)
- Students asked to complete a pre-quiz, go through module, then complete post-quiz (20 questions) – 100% students obtained higher marks in post- vs pre-quiz



3. Results – Resource design

Design

- 100% students said that course organisation and design made it easy to navigate

Interactivity

- 100% students agreed interactive elements were of high quality

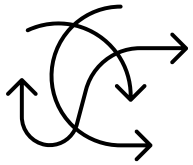
Engagement

- 100% students agreed that the interactive elements made the module more engaging

3. Results – Content

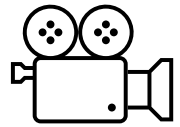
Learning

- 100% students said that they learned beyond what they already knew



Difficulty

- 78% students agreed the level of difficulty was appropriate for them



Visuals

- 95% students agreed that the addition of figures and videos were appropriate and enhanced their learning

3. Results – what students liked

- Highly engaging and interactive learning experience
- Strong use of visuals and multimedia
- Clear structure and effective learning design

3. Results – what needs improving

- Simplify and support complex topics (e.g. neurotransmitters)
- Improve balance across pages and reduce repetition
- Refine assessment (e.g. formatting inconsistencies)

What participants said

Interactivity & engagement
"I enjoyed learning through various types of short quizzes added throughout the main learning blocks, as it made reading lots of information much more interactive and enjoyable"

Design
"The information was easy to follow and at later stages it was building on information that had been learnt in previous sections"

Visuals
"I like the use of diagrams, especially when they were interactive. Also the videos were helpful"

Project students feedback

"My favourite part of this project was the creative freedom that came with designing how the content would be presented and making the interactive components engaging and fun"

"Working collaboratively with both students and staff throughout this project was a unique experience which resulted in a stronger outcome and made the process really enjoyable, feeling more like a meaningful work project than a university module“

"My favourite part of this project was creating the activities and images. This was the main area I focused on ensuring inclusivity, so I found it important to check everything and change activities to ensure they were fully inclusive for all potential students”

4. Conclusions

- The course is high quality, engaging and effective
- Strong learning gains
- Small refinements needed
- Co-creation with students was instrumental

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Thank you

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