

COMPLEMENT BIOLOGY

WITH DR KEVIN MARCHBANK

TALKING POINTS:

1. Why is it important to research rare diseases rather than just focus on common ones?
2. What organs do aHUS and C3G principally affect, and why is this a problem?
3. How is the immune system involved in aHUS and C3G?
4. Do you think places like the National Renal Complement Therapeutics Centre (NRCTC) are important? In what ways might they be more useful than places that focus solely on research or on treating patients?
5. Why do medical researchers use mice to investigate human disease? Why do you think mice are used more than other animals (for instance, fruit flies or chimpanzees)?
6. How does one make a mouse model?
7. How has the aHUS mouse model been useful?
8. What are your thoughts on the ethics of animal testing? How might things be improved?

MORE RESOURCES

- A video from KidneyResearchUK explores how the work of Kevin's team has improved the lives of people in the UK: On YouTube, search for KidneyResearchUK: The impact of research for aHUS patients (<https://bit.ly/31imcL6>)
- ProCon is a website that lists the pros and cons of controversial issues in an unbiased way. Here is their page on animal testing: <https://animal-testing.procon.org/>
- The 100,000 Genomes Project is collecting DNA data from people across the UK. One of the aims is to understand how variations in our genes cause diseases. Find out more: <https://www.genomicsengland.co.uk/understanding-genomics/genome-sequencing/>

ACTIVITIES FOR HOME OR IN THE CLASSROOM

THE DRUG DEVELOPMENT PROCESS

The development of new drugs is a very rigorous process and involves many stages. Only one or two in 10,000 will ever make it to market. In the table below, both columns are muddled. First, pair up the name of each stage with its definition. Then, put them in the right order.

Phase II	Testing the drug in small doses on a small number of healthy volunteers, to work out if it is safe.
Licensing	Large clinical trials at different locations involving a wide range of people, to investigate both effectiveness and any potential rarer side-effects.
Phase I	Running experiments to understand what causes a disease and using this knowledge to develop a substance that might help treat it.
Discovery	Presenting results from the studies to the regulatory authorities, who decide whether to issue a license.
Phase III	Once the drug is in use, its safety is carefully monitored by doctors and other medical professionals.
Monitoring	Larger studies involving people suffering from the disease, to see how effective the drug is.

The Multiple Sclerosis Trust's website has a good explanation of the process where you can check your answers:
<https://www.ms-trust.org.uk/a-z/drug-development-process>

DISCUSSION ON THE ETHICS OF ANIMAL TESTING

Pair up with a classmate to stage a discussion. One of you will be debating for animal testing, while the other is against it. You do not have to represent your own personal opinion. Use the information in the article to help you. Here are some topics to think about:

- Suffering of animals and humans
- Similarities and differences between animals and humans
- Practicality
- Regulation and monitoring
- Potential alternatives, including new innovations