

Developmental biology

with Dr Janine M. Ziermann

Talking points

KNOWLEDGE

1. What are craniofacial anomalies? Of these, which anomalies are the most common?
2. What are congenital heart defects?
3. How common are birth defects?

COMPREHENSION

4. What do the cardiopharyngeal mesoderm and the cranial neural crest cells do? What other cell types do they give rise to?
5. Summarise what the mandibular branch of the trigeminal nerve is. What sensations and functions is this branch of the nerve responsible for?

APPLICATION

6. What questions would you ask Janine about her work if you had the chance?

ANALYSIS

7. What effect does Gbx2 have on neural crest cells?
8. Why was Janine fascinated by the results of the mouse model which had a low expression of Gbx2? Why were these results so surprising?
9. How is Janine's work able to help future family planning?

EVALUATION

10. Scientific researchers often use animal testing within their work. How do you feel about this? To what extent do you think advances in science are worth the cost of animal life? What do you think are the advantages of reducing the number of animals used in research, as Janine says she would like to do?

Activities

1. Janine's aim is to stabilise her lab. To do this, she needs to secure more funding. Imagine you are Janine and create a presentation for prospective funders.

The aim of your presentation is to:

- Introduce the HeadHeartEvoDevo-Lab
- Summarise the lab's key findings and achievements, so far
- Emphasise the real-life impact the research carried out at the lab can have
- Explain the lab's ambitions for the future and how funding will enable them to happen.

Present to your class. Take questions from your audience and ask for their verdict. How keen are they to provide funding for your lab, and why?

If several of you are presenting, imagine you have a funding budget of \$500,000. Which presentations deserve some of the budget? What percentage of the money available can you secure for your lab?

2. Create a poster explaining the different organs and parts of the human body. You can choose to explain the whole body or focus on a smaller section.

Research online to get an idea of what to write. Visible Body is a fantastic website for understanding what the different organs and bones in our body are and how all of them work together: www.visiblebody.com/learn

When creating your poster, think about:

- How will you make the content of your poster interesting?
- Can you add diagrams and colour to make it more eye-catching?
- What fun facts can you add that you think most people will not know?
- Can you include a description of the functions of some organs?

After you have created your poster, show it to a friend. Then, quiz them on what they have learnt.

3. Challenge yourself to build a model! Janine recommends this website as a good resource for building models and understanding anatomy in more detail: www.anatomyinclay.com

More resources

- The Centers for Disease Control and Prevention website has a great list of facts about cleft lip and cleft palate. Learn more: www.cdc.gov/ncbddd/birthdefects/cleftlip.html
- Visit Janine's lab website, www.headheartevodevo.com, where there is more information about Janine's background, research and the other members of her lab – including its small, furry mascot and supervisor, Mr Julius Cheesar.