

Dental research

with Dr Jennifer Webster-Cyriaque and
the National Institute of Dental and
Craniofacial Research

Talking points

Knowledge

1. How prevalent is oral disease?

Comprehension

2. In what way can oral health be considered a 'barometer' of overall health?
3. How are technological advances impacting dental research?
4. Why do you think people from vulnerable communities face difficulties accessing dental care?
5. Why do you think many high-risk children will continue to come back to Donald with cavities, even after he has spent a lot of time treating them?
6. Why do you think Ophir uses animal models in his work? What does collating a broader range of data allow him to understand?

Analysis

7. In describing careers in dental research, the researchers use words and phrases such as 'impactful', 'opportunities', 'captivating', 'awesome', 'fulfilling', 'team science' and 'be intentional'. What do these descriptions reveal to you about the researchers' careers and their motivations for doing the work they do? Which word or phrase appeals to you the most, and why?
8. Why is it so important for Azeez to understand the genetic diversity that exists in the African countries his collaborative network spans? What do you think he and the team could learn about the causes of dental and craniofacial diseases?

9. Why is it important for Niki to take a bedside-to-bench approach in her research? What does this highlight about the motivations behind her work?

Application

10. What link has Caroline's research revealed between HIV, TB and oral candidiasis? How might this finding help with diagnosis in poorer communities?
11. What do you think could be the applications of the stem cell therapy that Ophir and Darnell are focused on? For example, what types of conditions could benefit from bone regeneration?

Evaluation

12. Caroline describes working with multidisciplinary teams as a career highlight. Why do you think she finds working with experts from different fields so rewarding? When have you had experience of working closely with peers who have different skills and knowledge than you? What did you gain from this experience? To what extent do you think you would enjoy working in a multidisciplinary research team in the future, and why?
13. What advantages do the 3D computational tools that Janice uses have over older 2D methods? What information do they provide her, and what impact do you think this has on her work? To what extent would you enjoy using computational tools and other technological advances as a researcher? In what ways do you think technology could further improve oral healthcare in the future?

More resources

- Watch Jennifer's animation, which summarises the range of research that dental researchers are undertaking: www.futurumcareers.com/Jennifer-Webster-Cyriaque-Aniamtion.mp4
- Download Jennifer's PowerPoint, which highlights key careers advice and poses more questions to get you reflecting on your own skills and aspirations: www.futurumcareers.com/stem-shape-powerpoint-presentations

- Listen to Jennifer's podcast to learn more about life as a dental researcher: www.futurumcareers.com/stem-shape-podcasts

- Smile Train is a global organisation that helps people with cleft palates around the world. Its website provides information about the condition, support for patients and families, and information on how you could get involved with fundraising. Visit the website: www.smiletrain.org.uk

Activities

1. Dental research

Jennifer highlights the many areas of science that contribute to dental research, and reading about the different researchers' work should also have given you an insight into some of the variety of expertise research in the field benefits from. Using the article and the internet, complete the table below:

Discipline	How this discipline is linked to dental research	Where I found this information	My reflection (how interested I am in this discipline, questions I'd like to explore further, etc.)
Genetics			
Oncology	"Many cancer treatments have side effects that affect a person's mouth, teeth and salivary glands..."	www.cancer.net	
Developmental Biology			
Bioengineering			
Neuroscience	"Understanding neural mechanisms that control orofacial pain, proper masticatory function, taste, speech, swallowing... is an important facet of dentistry."	'Neuroscience for Dentistry' by Barbara O'Kane and Laura Barritt	
Microbiology			
Immunology			
Biochemistry			What qualifications do I need to study biochemistry? (Action: Visit my local university's website to find out.)
Physiology			
Date Science			

- Which disciplines appeal to you the most, and why?
- What contribution would you like to make to dental research?

2. Dental careers

Imagine your school is organising a careers day, with older students presenting career information to peers or younger students. You (and your friends if you are working in a group) have been designated the field of dentistry.

For the careers day, you need to produce a stall or display, and be ready to answer questions people might have about opportunities in dental research. Your display could include:

- A poster summarising the different aspects of dental research highlighted in the article
- A diagram highlighting key statistics related to oral health

- Poster profiles of some of the researchers in Jennifer's article
- A visual representation of some the science behind the research (for example, a 3D model of a stem cell, a mock-up 3D computational tool)
- A visual representation of how dental research impacts people (for example, an imaginary patient profile, a leaflet highlighting key oral health conditions and how they are being tackled)

As Jennifer's article shows, the scope of dental research and the career opportunities available are huge. New technologies are also playing their part in progressing the field. Think about how your stall or display can convey the exciting opportunities offered

by dental research, especially to students who may not have read Jennifer's article.

If you can, ask fellow students (maybe from another class) to look at your display/visit your stall. How likely are they to pursue dentistry, and why?

Jennifer and the team would love to see examples of your work.

Email photos or digital copies of your work to: nidcrinfo@mail.nih.gov