

Neuroscience

with Dr George Ayoub

Talking points

Knowledge

1. What is folate and where can we find it in our diet?
2. What percentage of children born in the US are autism spectrum disorder (ASD) children?

Comprehension

3. What role does folate play during the first few weeks of pregnancy?
4. How is folate linked to ASD?
5. What is folate receptor alpha and what is it supposed to do during pregnancy?

Application

6. How could George's work on leucovorin impact people who have folate receptor alpha autoantibodies (FRAA) and are trying to conceive?

Analysis

7. In what way is reduced folate carrier like a country road that allows folate to reach the developing brain? To what extent did you find this metaphor useful?
8. What impact can leucovorin have on ASD children with FRAA?

Evaluation

9. George uses the phrase 'ASD children', rather than 'children with ASD', because many ASD people consider autism to be part of who they are, rather than a condition that they have. Consider the implications of each phrase. How does the difference in language change your perception of autism and identity?
10. George recommends avoiding click-bait articles to learn about science. Why do you think this is? How can you tell the difference between accurate and misleading information?

Activities

1. George often collaborates with a non-profit called Salud Santa Barbara. On their Instagram page, you can watch reels of George explaining his research to the public: [instagram.com/saludsb](https://www.instagram.com/saludsb)

In pairs, create your own version of a short social media reel that explains the facts behind George's research in simple and engaging terms. Think about the audience that you are trying to reach. Remember that in a recent study, 17% of women planning a pregnancy were FRAA positive. What is the most important information for them to know, how much background knowledge are they likely to have and what misconceptions might they have about folate and autism?

Once you have created your reel, share it with your friends or family. Do they think you explained the topic well? Did they find the reel interesting?

2. Spend some time exploring this interactive 3D brain model: brainfacts.org/3D-Brain#intro=true

Once you've explored the model, choose one area of the brain that you are interested in and create a short 5-minute presentation to show to your classmates or family.

In your presentation, make sure to include a small diagram of the area (you can screenshot parts of the 3D model by clicking the camera button), and give an overview of what this area of the brain does. Is it in charge of a biological process, such as your heartbeat or breathing? Or does it contribute to something like decision making, or your sense of smell or touch?

After your presentation, ask your listeners for their feedback and see what they learnt.

More resources

- As well as being a scientist, George is an author and educator. Listen to his interview on 805connect about his work: marksylvester.com/805-conversation/george-ayoub-author-scientist-and-educator
- The FRAT (Folate Receptor Autoantibody Test) website has some great information about Leucovorin and FRAAs: autism.fratnow.com/blog/leucovorin-and-fraas-why-it-makes-sense
- So Curious!, a podcast from The Franklin Institute, dives into the curious and sometimes weird world of science. Listen to their episodes on neuroscience to learn more about the field: fi.edu/en/podcasts-videos/so-curious