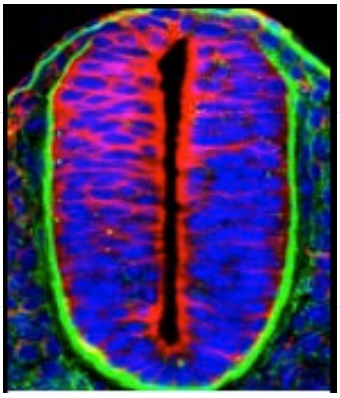
Meet the Lab

Nervous System Engineers | Data Sheet

name

Can You Help Me Make a Neural Tube?



Carlos is engineering cells to create a neural tube slice that looks like the one to the left.

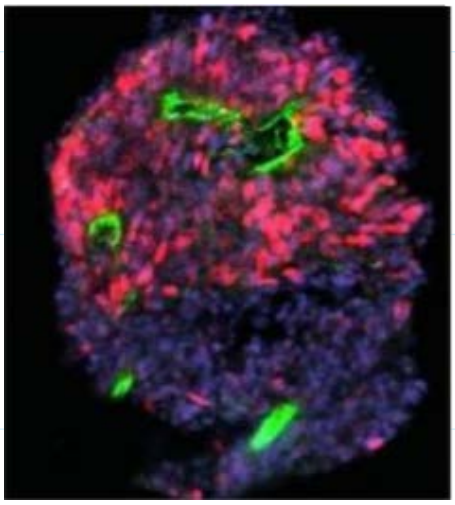
To do this, Carlos follows a cycle of engineering and biology. This is a four step process that requires 3D printing a tubular mold for cells to grow in. The mold size can be changed to learn how different sizes affect cell growth patterns.

Slide 3: Based on the images, what do you believe the **nervous system** does? How does it work? Discuss with your classmates or think about this question on your own and write your answers below!

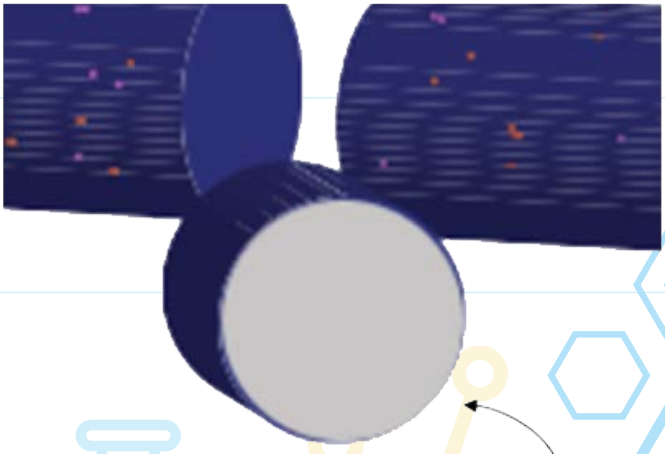
Slide 6: Do you remember Miranda's story? Why is it important to **research neural tubes**? Think about this or discuss with your classmates and then write down your answer.

Slide 11: What is a **mold**? Where in your life have you seen a mold used? Think about this question on your own, or talk with a classmate and then add your ideas below!

Slide 17: Draw out the patterns you see of the cells growing in each tubular mold so we can determine which size is best! You can draw on paper or annotate on top of the PDF.



Actual image



Draw pattern here

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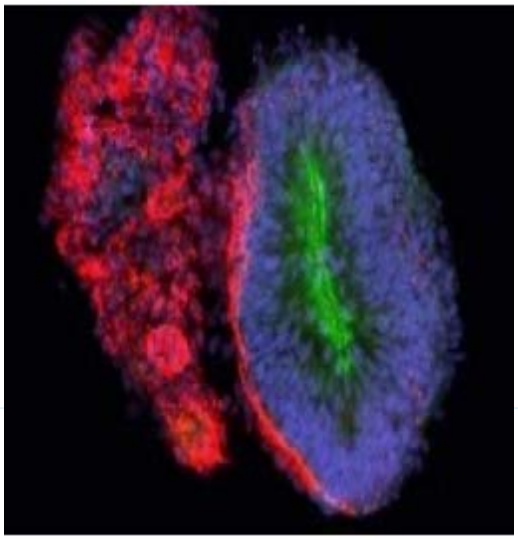

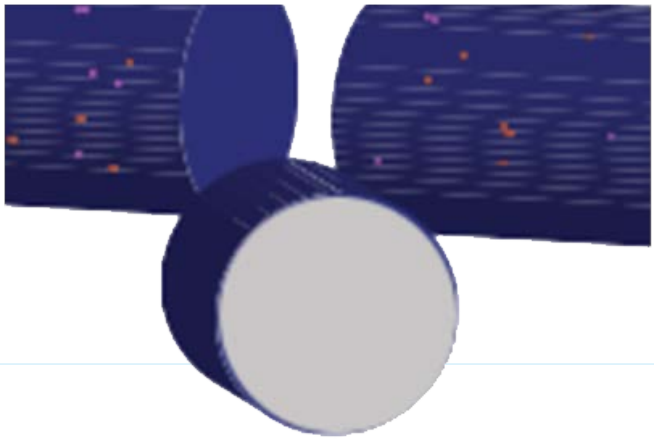

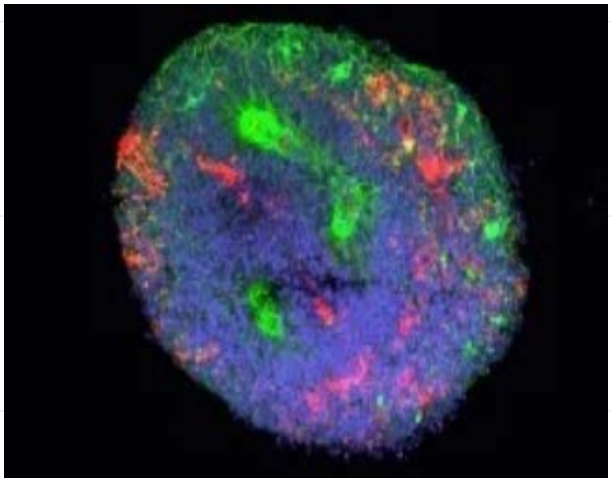

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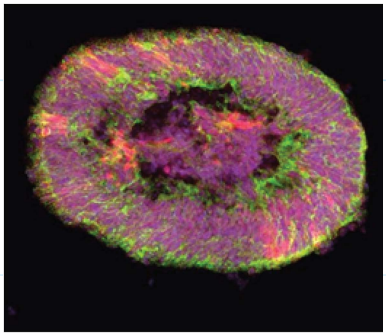
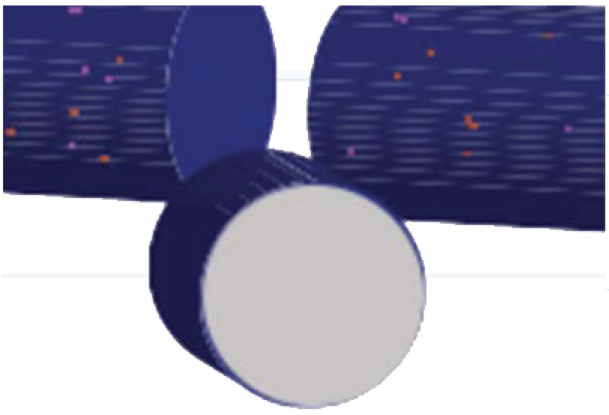
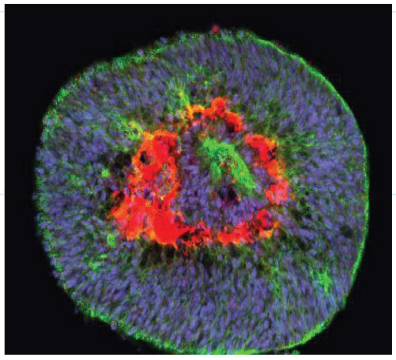
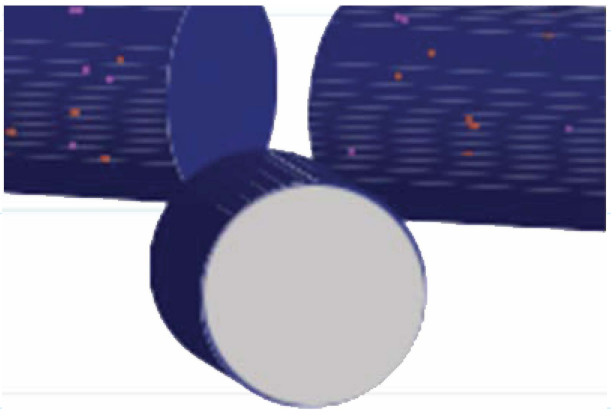
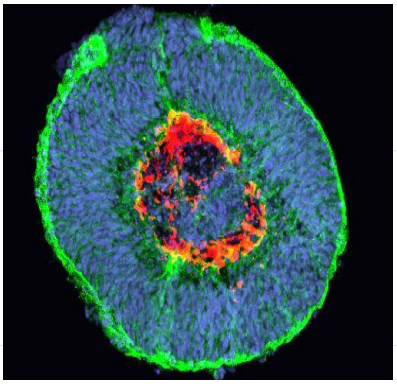
Slide 18: Repeat this process for the medium size tubular mold. Draw the patterns of cells you see in each slice.

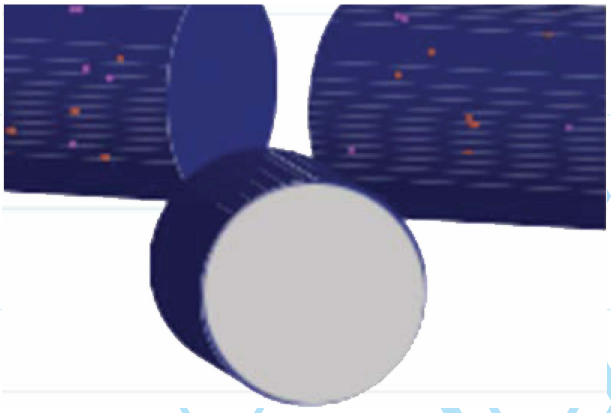












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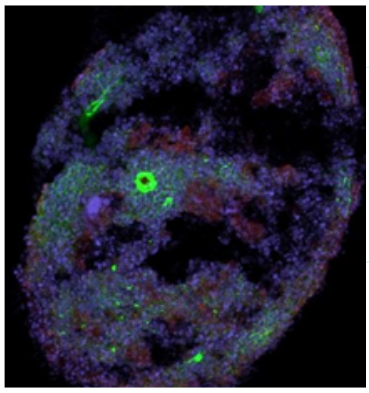
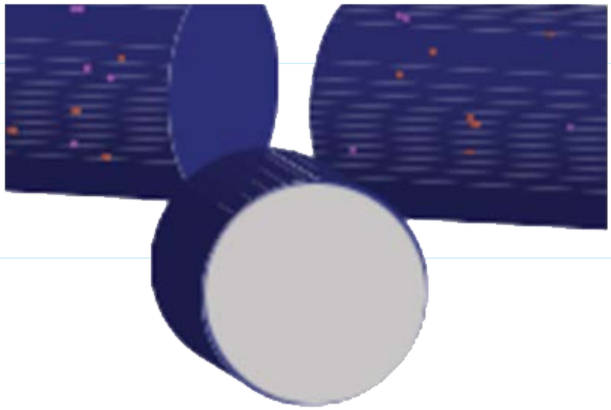
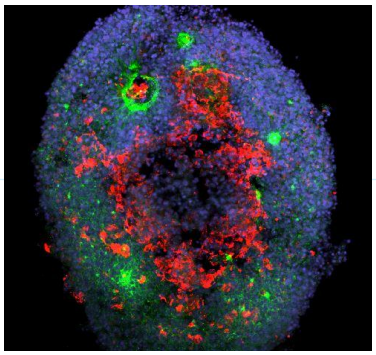
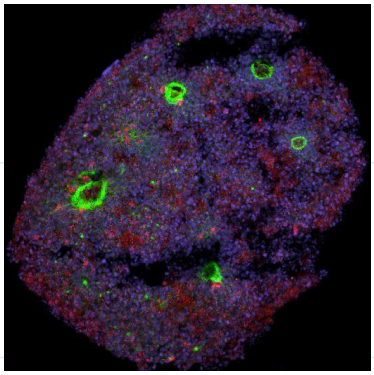
Slide 19: Finally, repeat this process once more for the largest size tubular mold. Draw the patterns of the cells you see in each slice.









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Slide 20: It's time to analyze your findings! What do you notice is the same or different between the small, medium, and large tube slices?

Slide 23: What size mold best created the patterns of cells similar to the neural tube?

Slide 28: Now that we know what *size* mold to use we can adjust a different factor to get our stem cells to look more like a neural tube. What factor would you experiment with next?

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