

PLANT SCIENCE WITH DR SEUNG YON (SUE) RHEE AND DR SELENA RICE

TALKING POINTS

KNOWLEDGE

1. Why are plants important for human society?
2. What are 'single-cell multi-omics'?

COMPREHENSION

3. How will the Plant Cell Atlas address shortcomings in the field of plant science?
4. Why might the location of a protein affect its function?

APPLICATION

5. The Plant Cell Atlas aims to help standardise methodologies for plant science research. If you were involved in the project, how would you begin this process?
6. Imagine you are in charge of communicating the project within a public outreach exhibition. What messages would you choose to focus on and why?

ANALYSIS

7. Why do you think large knowledge gaps about gene expression and protein function remain, even in very commonly studied organisms?
8. Why do you think the team is interested in meristem tissue in particular? How might their findings lead to real-world applications?

EVALUATION

9. Some people are concerned about possible unintended consequences of genetic modification of crops. In what way do you think the Plant Cell Atlas is likely to address these concerns?
10. In what way could the Plant Cell Atlas be useful for other areas of science?

ACTIVITY

Sue says that “systems biology, synthetic biology, biosensors, data science, artificial intelligence, gene editing, precision breeding and the microbiome” have all contributed to significant advances in plant science. Each of these areas reflects a rapidly-growing area of research that is shedding light on how plants function and how we can manipulate them for societal gains. Copy and complete the following table, using the internet to research each area. Feel free to go into more detail for any areas you find particularly interesting.

Area	Definition	Relevance to plant science research	Possible future applications in plant science	An interesting fact!
Systems biology				
Synthetic biology				
Biosensors				
Data science				
Artificial intelligence				
Gene editing				
Precision breeding				
Microbiome				

MORE RESOURCES

- Visit the Plant Cell Atlas website for the latest news about the project and new research and training opportunities: www.plantcellatlas.org
- This article provides a detailed look at the Plant Cell Atlas, explaining its rationale, goals and intended impact, and the underlying techniques being used to build it: www.elifesciences.org/articles/66877 (DOI reference:10.7554/eLife.66877)
- Have a look at The Plant Cell Atlas Art and Science exhibit: www.plantcellatlas.org/pca-art-exhibit.html
- Find out about student programs offered by CASE, the Carnegie Academy for Science Education: www.case.carnegiescience.edu