

Introduction to Botany. Lecture 8

Alexey Shipunov

Minot State University

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1 Questions and answers

2 Plant cell

- Discovery of cell
- Structure of cell



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Previous final question: the answer

Photorespiration increases when concentration of oxygen grows. Why is photorespiration so intensive at high temperatures?



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- When temperature is high, light stage makes more oxygen
- When temperature is high, plants closes stomata to avoid water loss. As a sideway result, concentration of oxygen in leaf tissues grows



Why to know photosynthesis?

[http://www.nature.com/nature/journal/vaop/ncurrent/
full/nature13776.html](http://www.nature.com/nature/journal/vaop/ncurrent/full/nature13776.html)

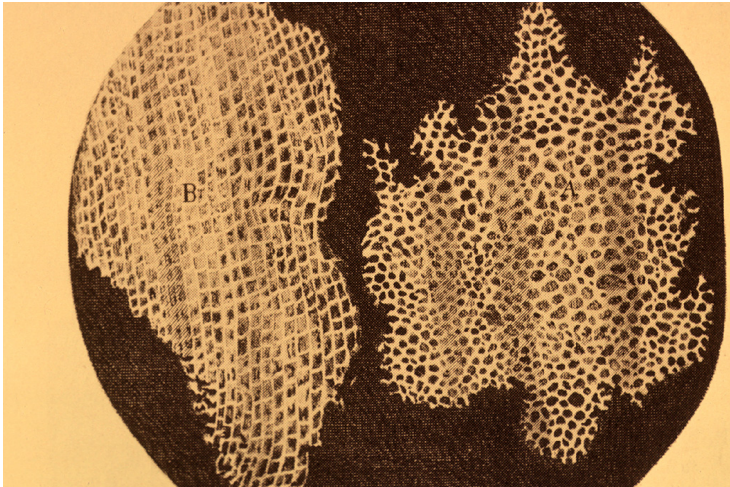


Plant cell

Discovery of cell



Discovery of cells



In 1665, Robert Hooke looked at cork tissue under microscope and found “little boxes or cells distinct from one another ... that perfectly enclosed air”



Hooke's microscope

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Cell theory

- 1 All plants and animals are composed of cells (1838, Matthias Schleiden and Theodor Schwann)
- 2 Cells reproduce themselves (1858, Rudolf Virchow)
- 3 All cells arise by reproduction from previous cells (1858, Rudolf Virchow)



Microscopes

Light microscopy was an early technological breakthrough that contributed to our understanding of cell structure. Dissectiscopes use reflected light, microscopes use translucent light. Magnification is of 10^3 order.

Transmission electron microscopy (TEM) allows us to see the internal organization of cells and organelles. Use translucent electronic “light” (electronic beam) which kills objects. Objects are often stained with osmium (Os). Magnification if of 10^7 order.

Scanning electron microscopy (SEM) provides an image of the surface of cells and organisms. Use reflected electronic “light” (electronic beam). Objects are covered with thin layer of gold (Au). Magnification if of 10^6 order.

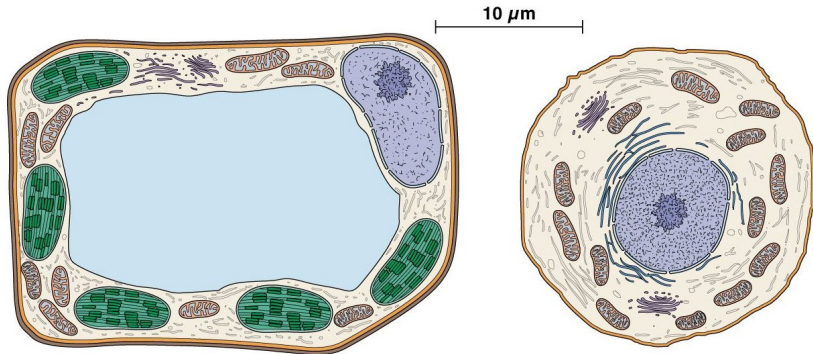


Plant cell

Structure of cell



Cells and cells



Eukaryotic and prokaryotic cells are fundamentally different



Cells



Final question (2 points)



Final question (2 points)

Name at least two differences between prokaryotic and eukaryotic cell.



Summary

- Eukaryotic and prokaryotic cells are cells of different levels of organization; in essence, eukaryotic cells are ecosystems



For Further Reading



A. Shipunov.

Introduction to Botany [Electronic resource].

2010—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_154



Th. L. Rost, M. G. Barbour, C. R. Stocking, T. M. Murphy.

Plant Biology. 2nd edition.

Thomson Brooks/Cole, 2006.

Chapter 3.

