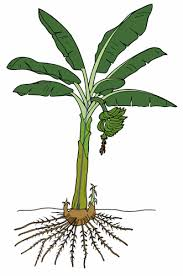
**Endosymbiosis and Plastids Lab**

1. Obtain one ripe banana and one new banana. Describe the taste, feel, and/or smell of the bananas and the banana type that would taste best to you.

|  |  |
| --- | --- |
| New banana | Ripe banana |

1. Take a piece of banana and perform an iodine test. Describe the differences. How do these differences relate to the taste of the bananas?

|  |  |
| --- | --- |
| New banana | Ripe banana |

1. Where did the starch go when the banana changed from a new (raw) banana to being ripe?
2. To view banana cells, simply rub some banana flesh on a slide and coverslip with iodine; a faint smudge of banana flesh will have ample cells for viewing. Draw each banana sample with 400x magnification

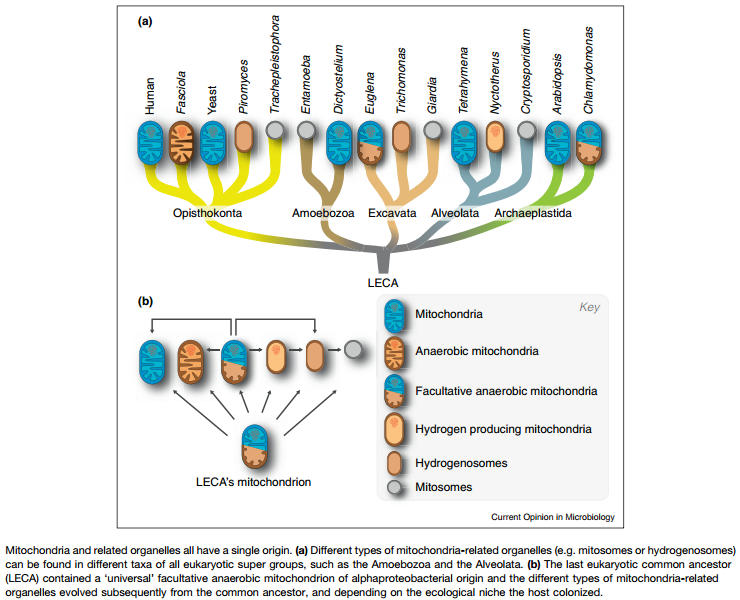
|  |  |
| --- | --- |
| New banana | Ripe banana |

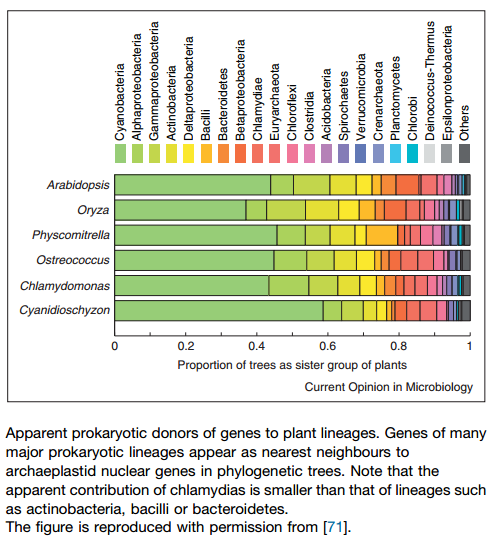
1. What is the difference between new (raw) banana cells and ripe banana cells?
2. Are there chloroplasts in the banana cells? How can you tell whether chloroplasts are there?
3. What is the function of chloroplasts, and would they be able to carry out that function in a banana cell? Which other areas of a plant might not be good at photosynthesis?
4. Identify the iodine-stained subregions within the banana cells. Is the starch within an organelle or not?
5. Banana seeds do not have chloroplasts (photosynthetic organelles in leaf cells), amyloplasts (starch-storing organelles in fruit cells), or chromoplasts (pigment-producing organelles in flower cells.) However, each of those organelles have their own DNA, and the DNA of chloroplasts, amyloplasts, and chromoplasts in a given banana tree is genetically identical. How does a banana tree produce tissues with these different plastids?
6. How can a banana make starch (and cellulose), if it does not make glucose?
7. Why is glucose transported and what is it for?
8. Why is there so much chemical energy in bananas?

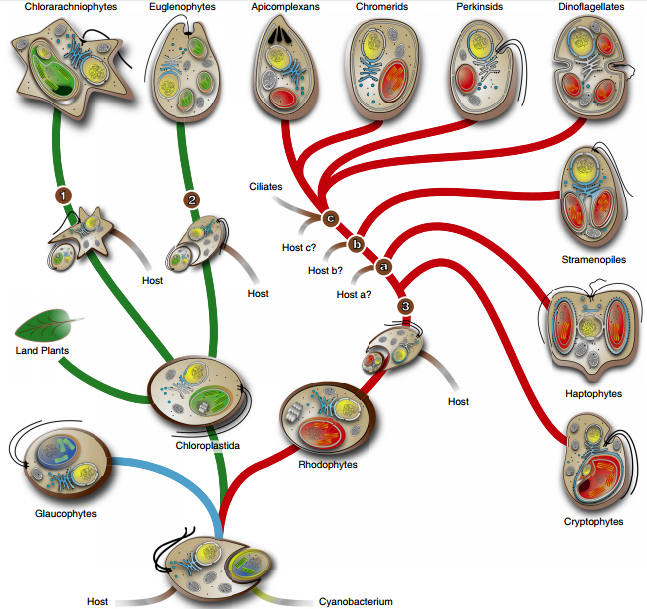
Handout written by Jon Darkow.

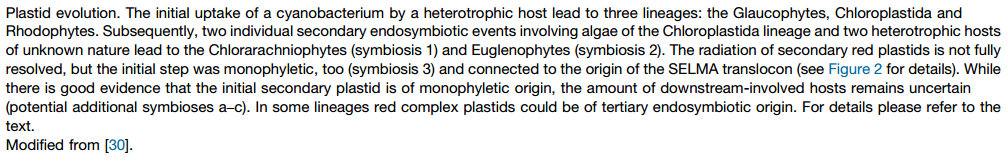
**Readings**

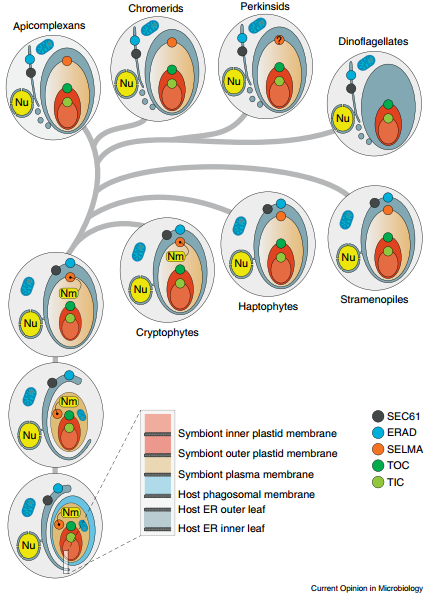
* Ftsz <http://www.sciencedirect.com/science/article/pii/S0167488906000723>
* Coral photosymbionts <http://www.hhmi.org/biointeractive/coral-bleaching>
* Summary of endosymbiosis evolution <http://www.hhmi.org/biointeractive/coral-bleaching>
* Zimorski, V., Ku, C., Martin, W. F., & Gould, S. B. (2014, 12). [Endosymbiotic theory for organelle origins.](http://www.efn.uncor.edu/departamentos/divbioeco/divveg1/diversidad%20vegetal%20i/bibliografia/zimorski%20et%20al%202014%20tes%20review.pdf) *Current Opinion in Microbiology,* *22*, 38-48. doi:10.1016/j.mib.2014.09.008

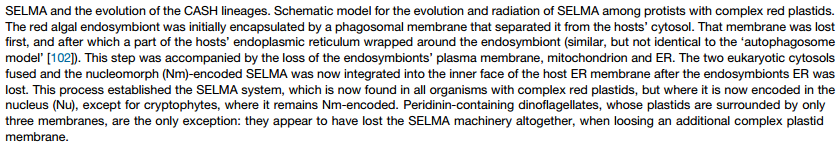












References

Tamarkin, D. A. (2015, 10). Exploring Carbohydrates with Bananas. *The American Biology Teacher,* *77*(8), 620-623. doi:10.1525/abt.2015.77.8.9