

BIO 5099
Homework Assignment #3

Name _____

Due start of class, **Tuesday September 10th**

Late assignments are not accepted

Assignments may be e-mailed to: christiaan@xiaan.com or rbaror@dmibio.com anytime, or faxed to (303) 556-2889 between 3:00 and 4:00 p.m. on Tuesday.

Define in your own words and give an **example**:

1. (2pts) Organelle

2. (2pts) Chemotaxis.

3. (2pts) Cladistics

4. (2pts) Ichnofossil

5. (2pts) Bauplan

6. Suppose you are culturing a sample from a patient to determine what kind of infections this patient may have. Suppose after 3 days of culturing you note a colony of bacteria that has an area of 1 cm^2 .
 - a. (3pts) If we assume that the particular bacteria we found has a size of $1 \mu\text{m}^3$, they double every 2 hours and that the average thickness of the colony is 20 bacteria, how many bacteria were present in the original sample?

- b. (2pts) Would you expect similar growth in the patient? Why?
- c. (2pts) Why do doctors insist that you take antibiotics for 10 days even if you feel better long before?
7. (5pts) Draw a diagram of a typical eukaryotic cell and at least 4 of its major components. Give a brief explanation of what each component does.
8. (4pts) Trace the taxonomy of the Monotremata all the way up to its kingdom and briefly describe each taxon you mention.

9. What can you infer about the most recent common ancestor of the following. What characteristics did it likely have? When did it live?

a. (2pts) Humans and Tyrannasaurus Rex

b. (2pts) Humans and hagfish

c. (2pts) Humans and spiders

10. (8pts) Choose an extinct organism (preferably one that you saw at the museum) and tell us about it (where & when did it live, what did it eat, what are some unique characteristics, selective pressures that caused its extinction, what evidence of its existence do we have...etc)