Themes 1

- send answer to iClicker Question 7A now.

Cellular Nutrition

– in general; minimal; & elemental

- bacteria
- plants, animals, & fungi

iClicker Question 7B

Due in lab **next** week:

⇒ pre-lab for Aipotu IV (lab manual p 51 and on-line)

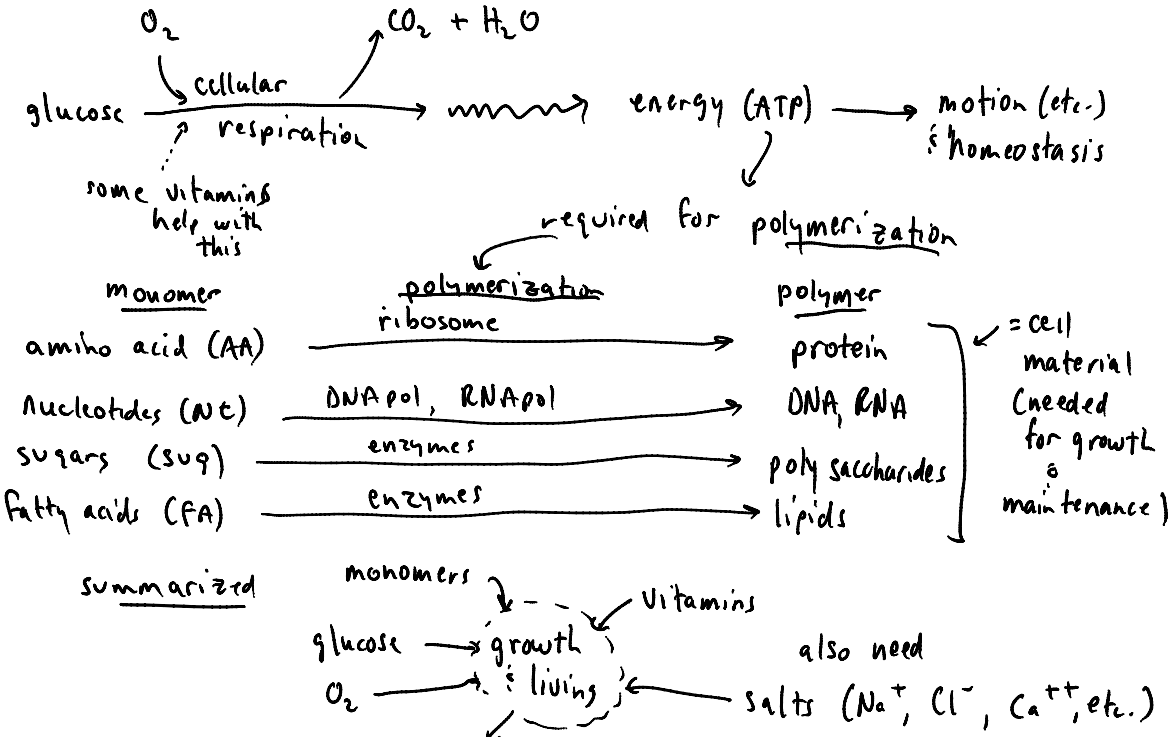
⇒ Molecular Phylogeny lab report

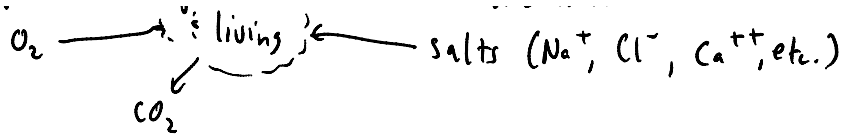
Development Group (BW Tutorial) Tues 1:00 - 2:00 in W-2-032

Exam 1: Monday 3/1 (info in Themes 2 handout)

- Last names A - G in McCormack Cafe (3rd floor above stairwell)
- Last names H - Z here (1 bonus point for going to correct place!)

Cellular nutrition = minimal "core metabolism"
all cells must do these reactions (schematic)





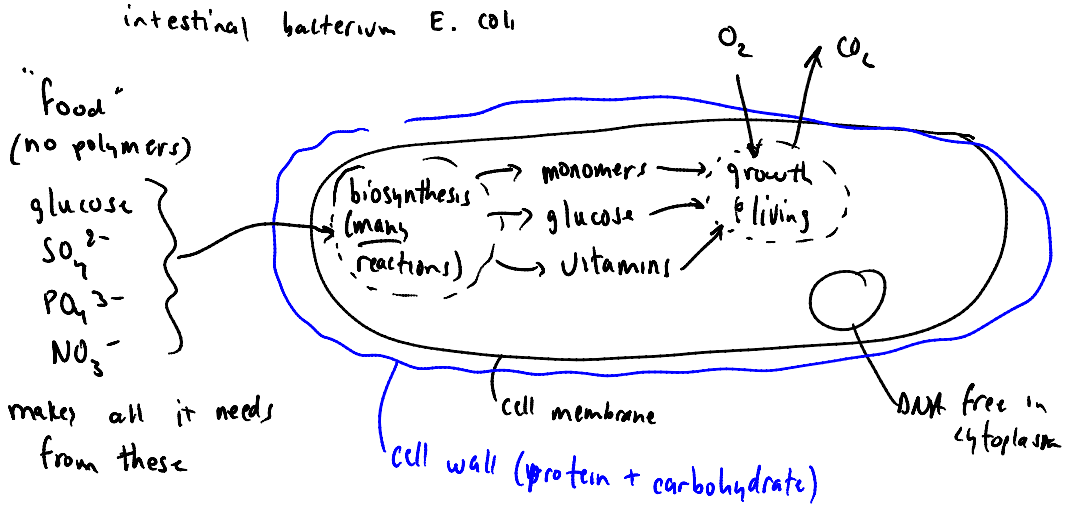
Elemental - all living things need atoms of C H O N P S (& more)

- these elements are available in different forms in different habitats

form	C	H	O	N	P	S
gaseous	CO_2	H_2O	O_2	N_2	-	-
dissolved in H_2O	CO_2	H_2O	H_2O/O_2	NO_3^-/NH_4^+	PO_4^{3-}	SO_4^{2-}
organic (part of C-containing molecules)	[all monomers have C, H, O]	AA, Nt	Nt		AA	

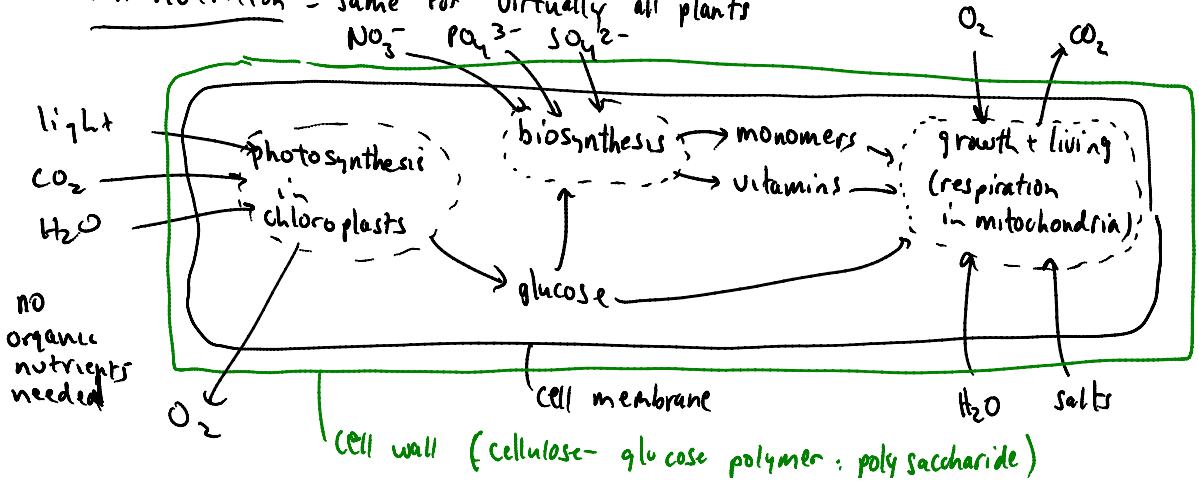
Bacterial Nutrition (very variable) one example

intestinal bacterium E. coli



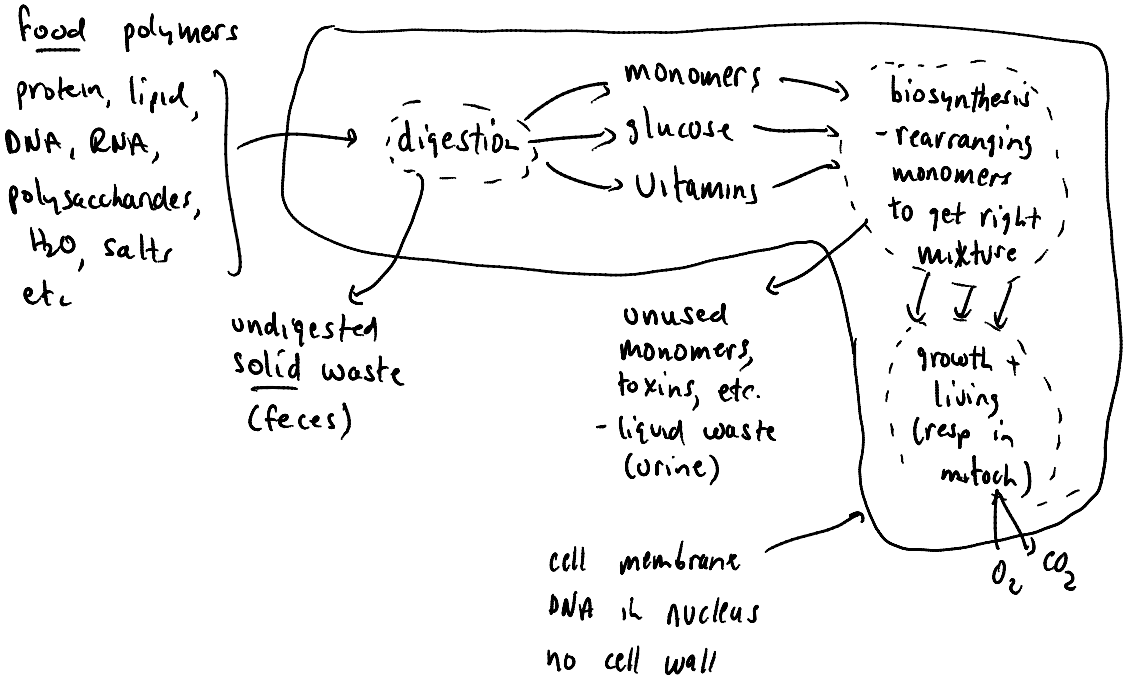
(no organelles except ribosomes)

Plant nutrition - same for virtually all plants



* DNA in nucleus

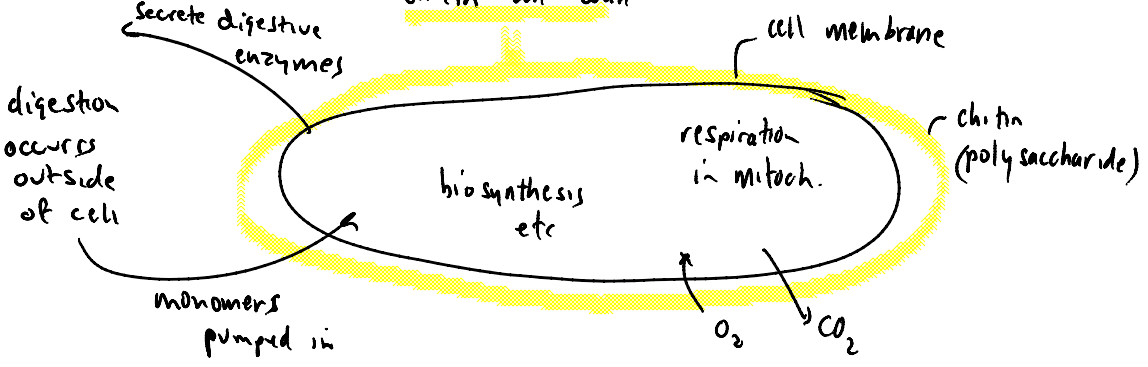
Animal nutrition - all processes not always done in the same cell
(protozoa do it all in one cell)



Fungal nutrition: all processes done in all cells

* DNA in nucleus - often more than one nucleus per cell
(sometimes can have different genotypes - "heterokaryon")

* same as animal (eat polymers made by others = "heterotroph")
except - secrete digestive enzymes
- have chitin cell wall



Summary

carbon source	NPS source	energy source	major structural material & notes

plants	CO_2	inorganic NO_3^-, PO_4^{3-} SO_4^{2-} in H_2O	light	cellulose - glucose polymer ("free" because p' synth makes lots of glucose) * rigid ∴ hard to move ⇒ pollination
animals	organic in food	organic NPS in food	chemical energy in food	protein (bone, etc.) flexible ⇒ move ⇒ behavior, etc.
fungi	"	"	"	chitin - not flexible ∴ digest food nearby