CONCEPT	L. END	OSYMBIOTIC	: THEORY
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●The <u>endosymbio</u>	o <u>tic theory</u> : mitochondria & ch	nloroplasts were once inc	ependently living	.	
●~1.5	_ years ago, an <u>aerobic</u> bac	terium was engulfed by a	n <u>anerobic</u> host cell, m	aking a <u>symbiotic relation</u>	ship.
□ Over tir	me, the aerobic bacterium los	st many genes/abilities &	developed into today's		
□ Photos	ynthetic <i>Cyanobacterium</i> we	re engulfed by a host cell	& over time, evolved to	o the	
EXAMPLE:	Cyanobacterium				
Host Cell	es di la constituiti	Chloroplast	Plant	Cell Plant	
			Windows Windows		1
			Smooth and State of S	Chronians	1
		M. I.	Edg wordy	interface of ed	
Aerobic		Mitochondrie	Animal Animal	Cell Animal	
bacterium			# #423 10000000 10000000 3000000	9	
			Grand- Gr	7 Oct - Andrew Contract of Con	SW
	Mitochondrion		Marines Andrews Andrew	55 55	
Supporting Evid					
Mitochondria & o	chloroplast have many simila	rities to prokaryotes:			
□ Both have: 1) small circular DNA, 2) 70	S ribosomes, 3) replic	ate via	·	
●Mitochondria & d	chloroplast both have a	membrane that o	liffer from each other.		
Mitochondria					
	ce <u>ATP</u> (energy for a cell) via	energ	y metabolism.		
●Vary in shape &	have their own DNA that is i	ndependent of the nuclea	ar DNA.		
□ Have an oute	r & an membrane,	which is highly folded in	to <u>cristae</u> to increase s	urface area.	
●Location of majo	or processes of re	espiration, like the Citric	Acid Cycle & electron ti	ansport chain.	
EXAMPLE:	•	•	DNA Ribosomes	Matrix Outer Inner membrane membrane	
	Cellular Respiration 6 CO				
$C_6H_{12}O_6 + 6C_6$	$_{2} \xrightarrow{\text{condition recognitation}} 6 \text{ CO}_{2}$	+ 6 H ₂ O + ATP		2000	
Oxy	gen Carbon	Matan			
	as Dioxide	+ Water +			
			Protein that makes ATP (ATP Synthase)	Cristae Intermembrane Sp	pace
<u>Chloroplasts</u>					3400
●Function: perform	m to prod	luce chemical energy from	n energy.	Thylakoid	
EXAMPLE:			Outer membrane	Chloroplast	
					Stroma
6 CO ₂ + 6 H ₂ O -	+ Sunlight Photosynthesis	$ ightharpoonup C_6H_{12}O_6 + 6 O_2$	Granum		
	i notosynthesis				

CONCEPT: ENDOSYMBIOTIC THEORY

PRACTICE: According to the endosymbiotic theory, which of the following is likely the ancestor of the mitochondria?

- a) Aerobic eukaryotes
- b) Aerobic bacteria
- c) Anaerobic bacteria
- d) Cyanobacteria
- e) Chloroplasts

PRACTICE: What is the primary purpose of cristae in the mitochondria?

- a) Provide a large surface area for chemical reactions
- b) Prevent the mitochondria from folding onto itself
- c) Protect the mitochondrial DNA
- d) No purpose has been identified yet