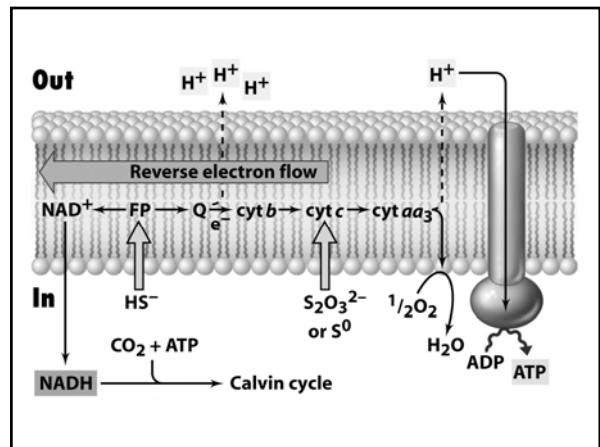
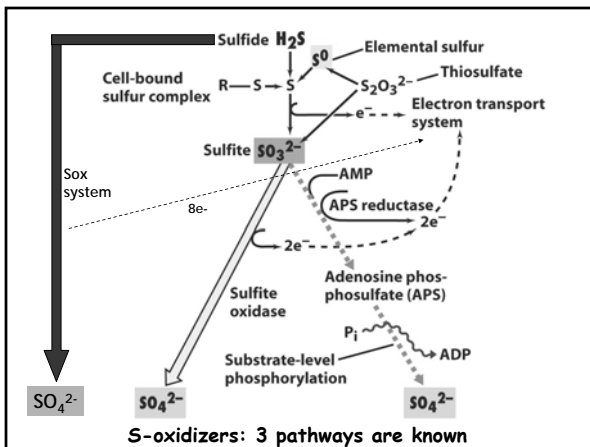
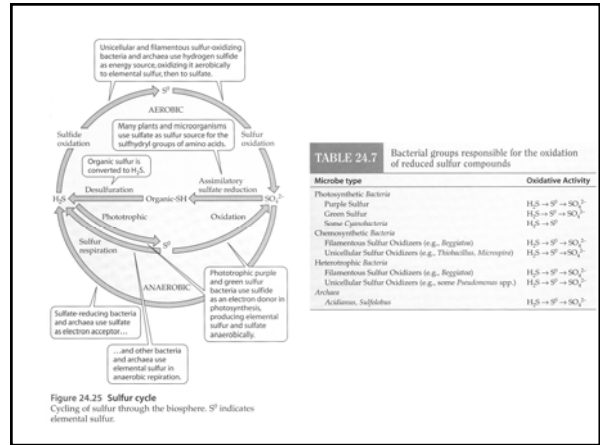
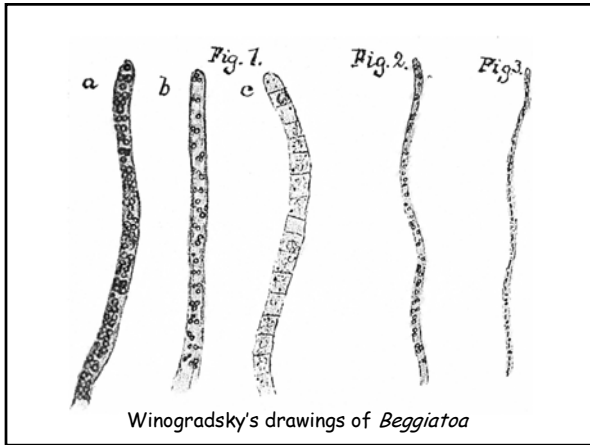
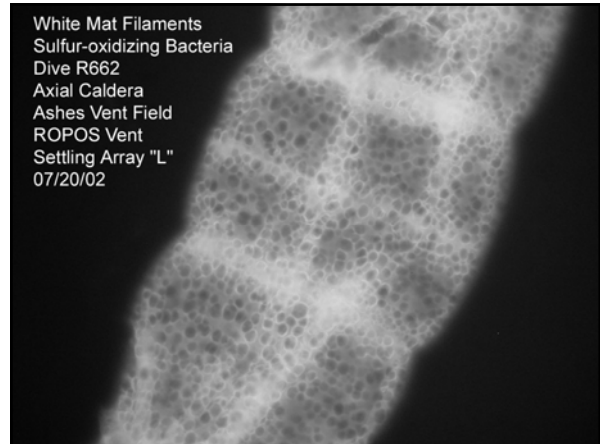


More on Chemotrophic Potential S & Fe Cycles



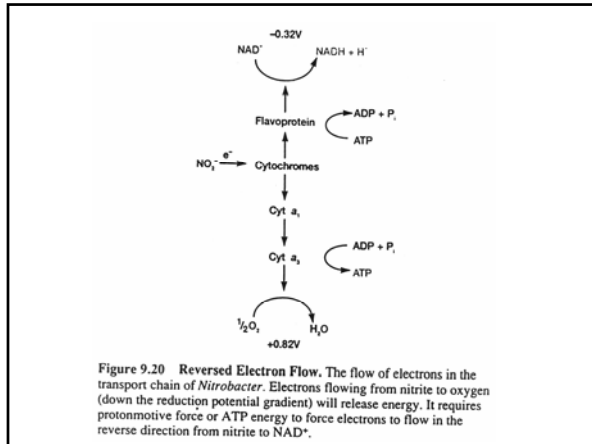
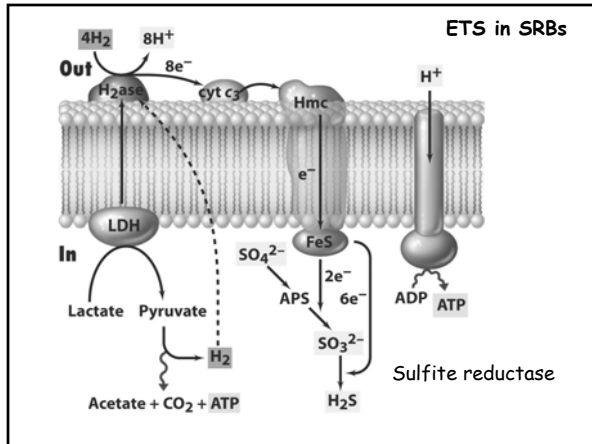
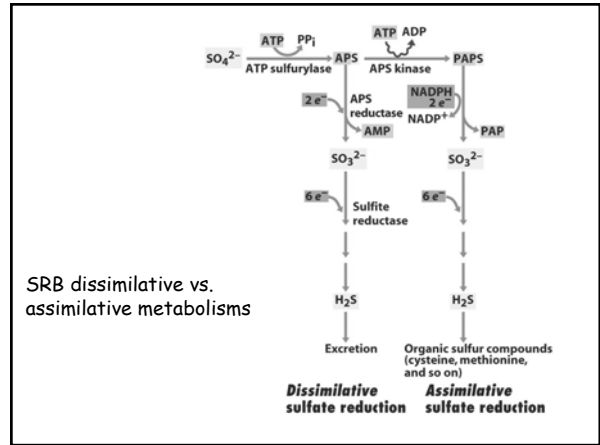
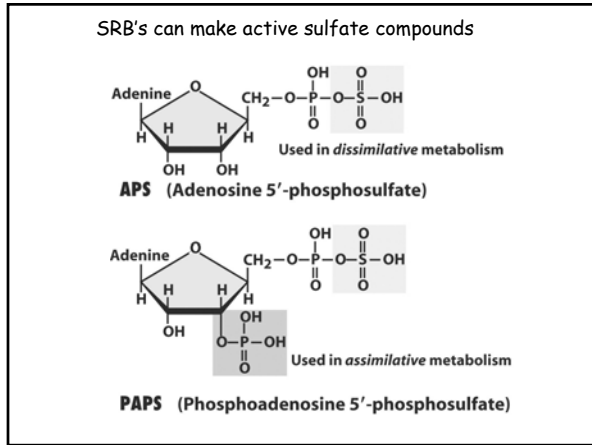


Table 17.3 Sulfur compounds and electron donors for sulfate reduction	
Compound	Oxidation state
Oxidation states of key sulfur compounds	
Organic S (R-SH)	-2
Sulfide (H ₂ S)	-2
Elemental sulfur (S ⁰)	0
Thiosulfate (S ₂ O ₃ ²⁻)	+2 (average per S)
Sulfur dioxide (SO ₂)	+4
Sulfite (SO ₃ ²⁻)	+4
Sulfate (SO ₄ ²⁻)	+6
Some electron donors used for sulfate reduction	
H ₂	Acetate
Lactate	Propionate
Pyruvate	Butyrate
Ethanol and other alcohols	Long-chain fatty acids
Fumarate	Benzoate
Malate	Indole
Choline	Hexadecane



Sulfur Disproportionation

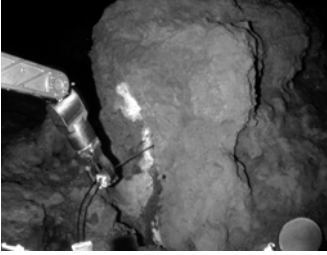
$$S_2O_3^{2-} + H_2O \rightarrow SO_4^{2-} + H_2S$$


$$\Delta G^0 = -21.9 \text{ kJ/rxn (not huge!)}$$

Get your cake and eat it too!

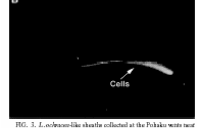


Loihi Volcano





Sheath cells



Cells

FIG. 3. Endogenous-like filament collected at the Puffin's vent near vent number 27. The sample filament is shown in (A). Panel (B) is the same image as in panel (A) but viewed by epifluorescence to reveal a filament of cells inside the transparent sheath. The cells are only visible when stained; most of the sheath are empty. (Scale bar, 5 µm.)

Neutrophilic Fe-Oxidizing Bacteria
zeta-Proteobacteria (novel class)
Mariprofundus ferrooxydans (Type strain)

