

BACTERIAL NUTRITION

By

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Bacterial Nutrition

□ 1. Carbon Source

- Autotrophs – CO_2 as Sole carbon source
- Heterotrophs - Other organic compounds

□ 2. Nitrogen Source

- Nitrate
- Nitrite
- Amonium Salts

Bacterial Nutrition Cont

3. Oxygen

- ▣ Water

4. Phosphorus

- ▣ Essential component of Nucleotide
- ▣ Phospholipids

5. Sulfur

- ▣ Synthesis of Amino acids – Cysteine, Methionine

Bacterial Nutrition Cont

6. Metal ions

- ▣ Essential elements – Ca, Mg, Fe, K
- ▣ Trace element -Zn, Cu, Mo, Ni, Co

7. Vitamins

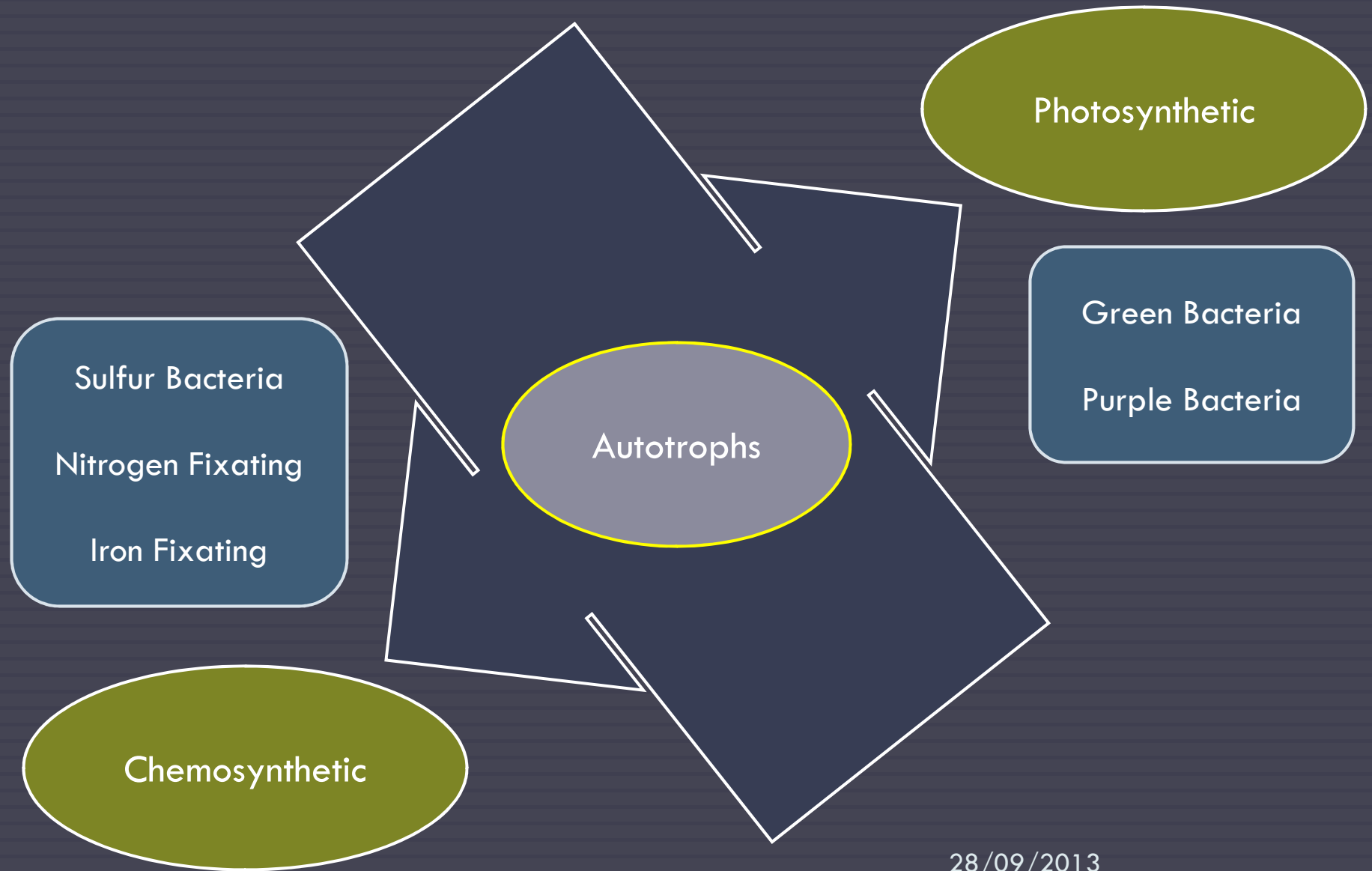
- ▣ Thiamine,
- ▣ Riboflavin,
- ▣ Pyridoxine,
- ▣ Folic acid etc.

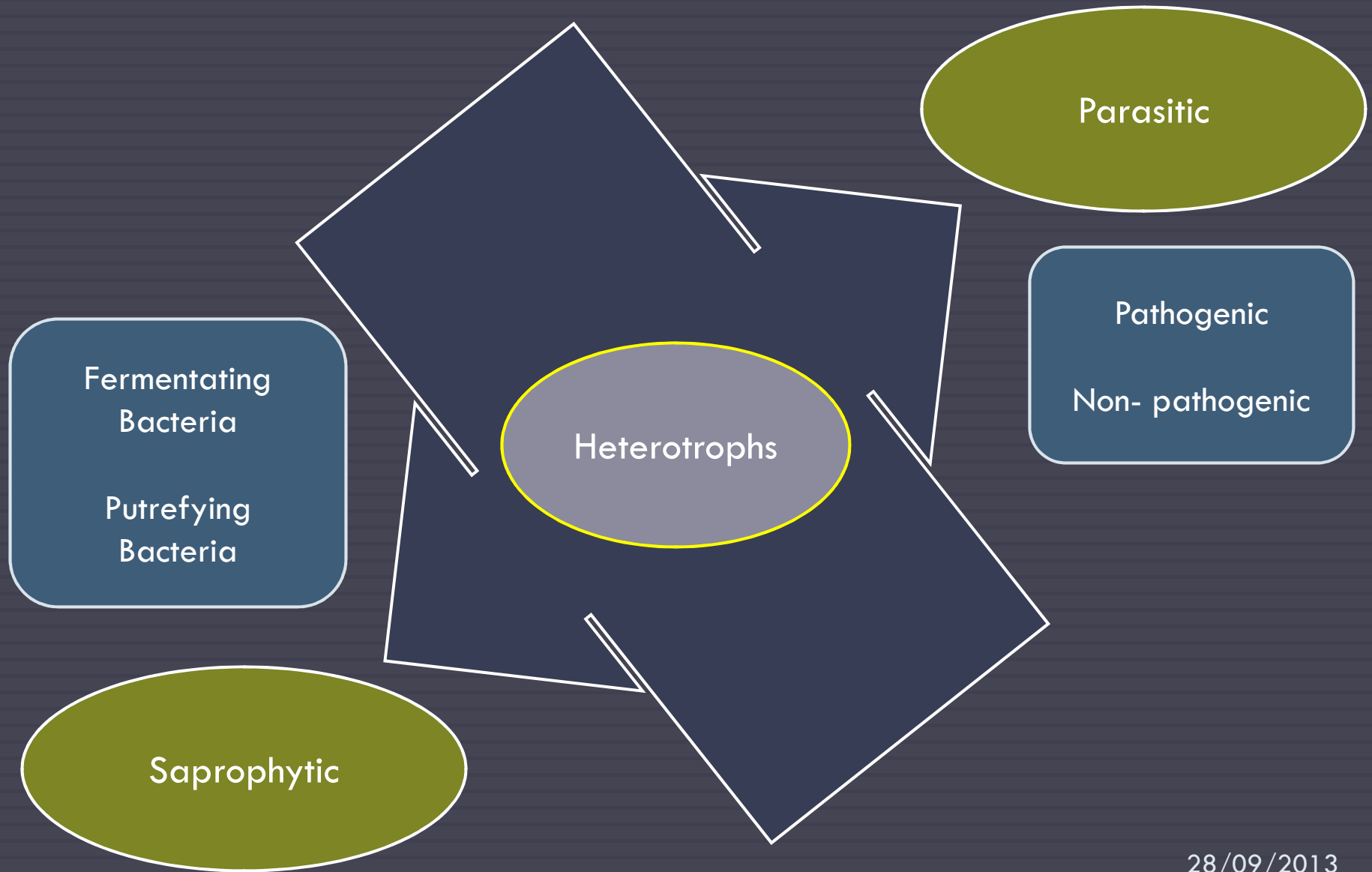
Bacteria

Autotrophs

Heterotrophs

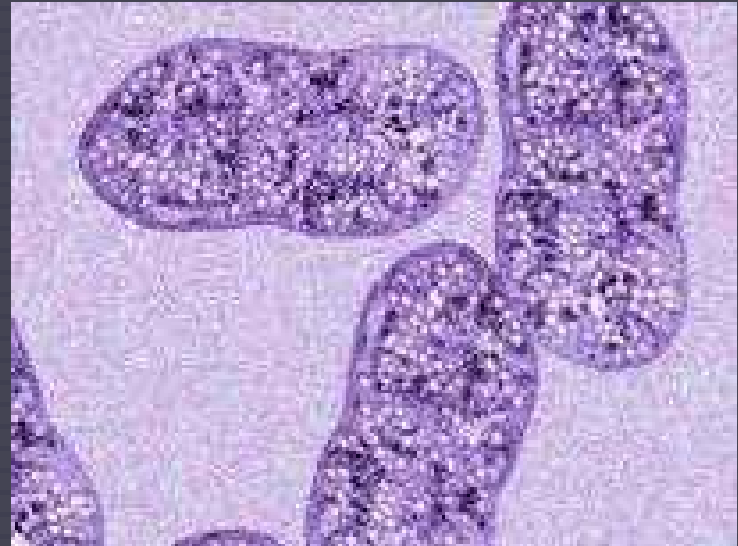
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Purple Bacteria

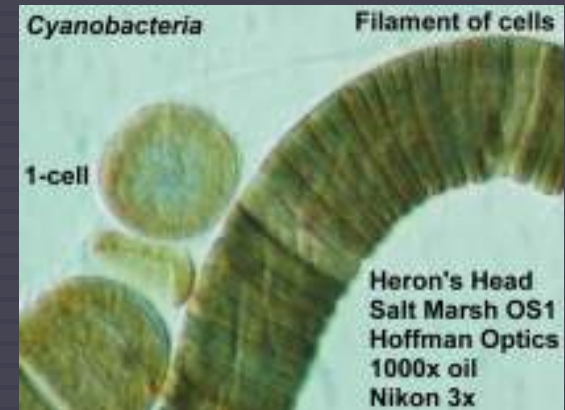
- Contain —
 - ▣ Photosynthetic Pigments
Bacteriochlorophyll a & b
- Example —
 - ▣ *Rhodopseudomonas* spp



Green Bacteria

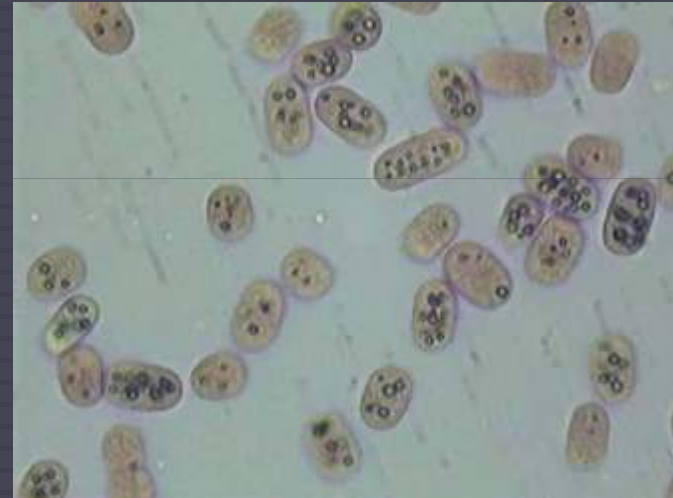
- Bacteriochlorophyll c and d

- Example –
Cyanobacteria



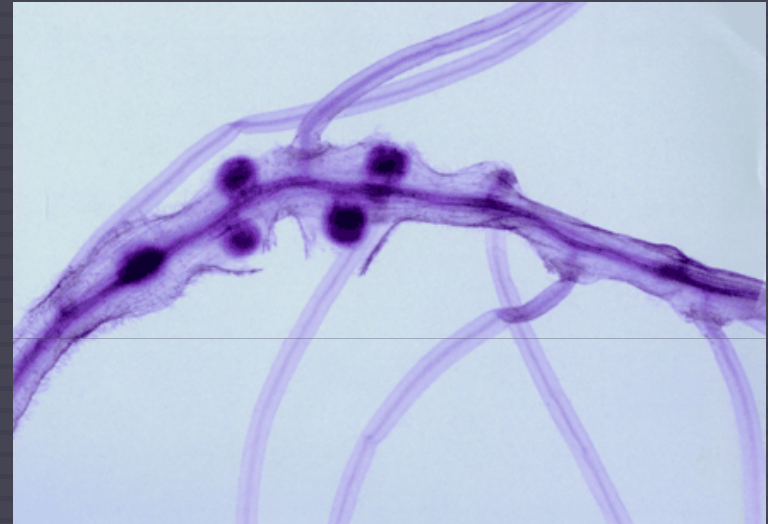
Sulfur Bacteria

- Sulfur Bacteria
 - ▣ Utilizes H_2S
 - ▣ Deposit inside the cell as granules
 - ▣ $\text{H}_2\text{S} + \frac{1}{2} \text{O}_2 = \text{S} + \text{H}_2\text{O}$
- Non-Sulfur Bacteria
 - ▣ Deposit (S) outside the cell
 - ▣ Grow on acids, amino acids etc.



Nitrogen Fixing Bacteria

- Autotrophic N Fixing Bacteria
 - ▣ Live in soil
 - ▣ Eg. *Clostridium* and *Azobactor*
- Symbiotic N Fixing Bacteria
 - ▣ Live root nodules of leguminous plants
 - ▣ Eg. *Rhizobium radicicola*



Iron fixing

- Oxidation of iron
- Deposited as insoluble ferric hydroxide
- Eg. *Ferrobacillus*

Heterotrophic Bacteria

- Parasitic
 - ▣ Obtain nutrient from other organisms
 - ▣ Host – Plant & animal
- Saprophytic
 - ▣ Fermenting
 - ▣ Glucose to ethanol
 - ▣ Putrefying
 - ▣ Protein & Nitrogen



Thank you