A. Division of labor in Cyanobacteria

Vegetative cell photosynthesizes sugars

O₂

light

CO₂

sugars

nitrogenase

Heterocyst fixes nitrogen

N₂

NH₄⁺

N₂

sugars

B. Bacterial quorum sensing

Unbound receptor is inactive

Low cell density
Low autoinducer concentration

Bound receptor binds to promoter

High cell density
High autoinducer concentration

Gene is expressed

B. Bacterial quorum sensing

C. Social development in *Dictyostelium discoideum*

Unicellular amoebae starve and aggregate

Stalk cells die during fruiting body formation

Amoebae → Mound → Mobile slug → Fruiting body

D. Biofilm development in *Pseudomonas aeruginosa*

Colony formation

Microcolony formation

Mature biofilm

Scripted matrix

Channels

Dispersal

E. Symbiont exploitation in *Candidatus Hodgkinia cicadicola*

Symbionts provide amino acids within host crypt

Within-host competition leads to complementary gene loss

Larger symbiont populations required to maintain benefits