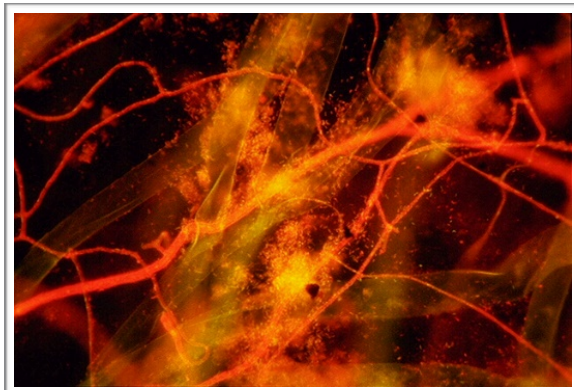


Plant-Microbe interaction

- **Microbe** - microscopic organisms
 - Virus
 - Bacterium
 - Fungus
 - Nematode - roundworm
- **Positive interaction**
 - **Symbiosis** - long-term interactions between different biological species (benefits both)
 - **Rhizobium**
 - Nitrogen fixing bacteria associating with roots of legumes
 - Green manure
 - **Mycorrhiza**
 - Association of fungus and roots of plants
 - Fungus transfers nutrients to plants
 - **Ectomycorrhiza**
 - Surrounds roots
 - **Endomycorrhiza**
 - Penetrates intracellular cells of roots
 - Produces vesicular- arbuscular mycorrhiza VAM: collect food, nutrients exchange



- **Rhizosphere**

- High microbial density
- Induce plant growth, releases auxin and gibberellin
- Keep moisture
- Inhibit growth of soil pathogen
- Decrease soil toxicity
- Nutrient recycling
- Ex. Trichoderma

- **Lichen**

- Association of fungus + plant, algae
- Metabolites leaked from both
- Fungus surrounds algal cells to provide moisture. CO₂
- Air pollution indicator
- Crustose : cover substrate like crust
- Foliose: leafy form
- Fruticose: shrubby form



- Negative interactions

- **Parasitism/pathogen:** parasite benefits from host
 - Causes plant disease
 - How: nutrient competition, inhibition of plant metabolism, inhibition of vascular system, destroy plant cells for nutrients
 - Causes: fungal diseases(leaf spots, powdery mildew), bacterial disease(soft rot, leaf blight, wilt), viral diseases(ringspot, mosaic), nematode diseases(cyst, foliar), higher parasitic plant disease
 - 3 factors that cause disease: virulent pathogen, susceptible plant, suitable environment for a disease
 - How pathogens damage plants? : wounds, natural openings: stomata, hydrathodes, lenticels, direct penetration: cuticle, epidermal cells
 - Symptoms: leaf spot , leaf bright, mosaic, stem root

