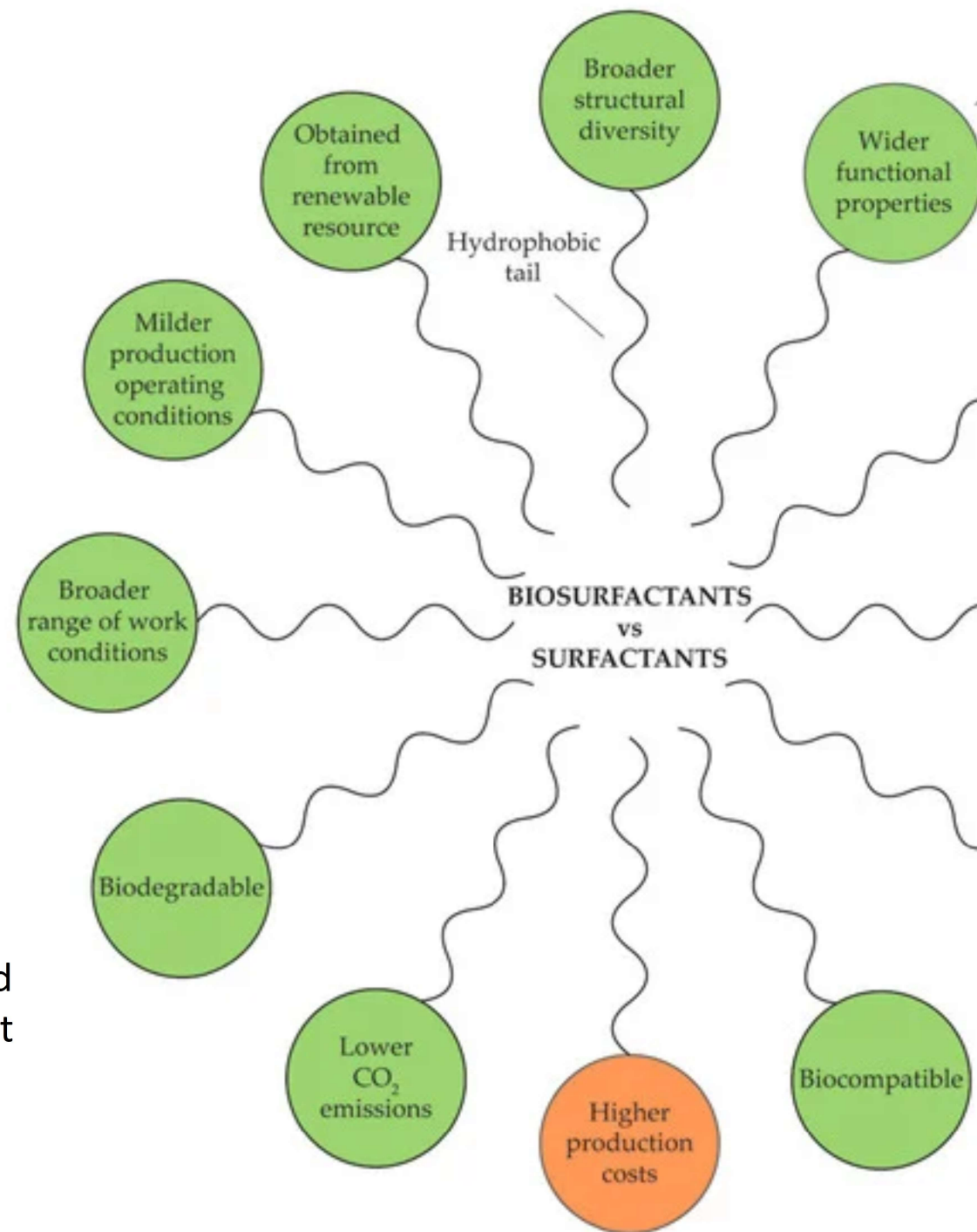


Biotechnological Utilization of Food & Agro-Industrial Residues and By-Products

Sustainable Production of Biosurfactants

Advantages (green circles) and disadvantages (orange circles) of biosurfactants in comparison to chemically derived surfactants; schematic presentation of a surfactant micelle cluster.

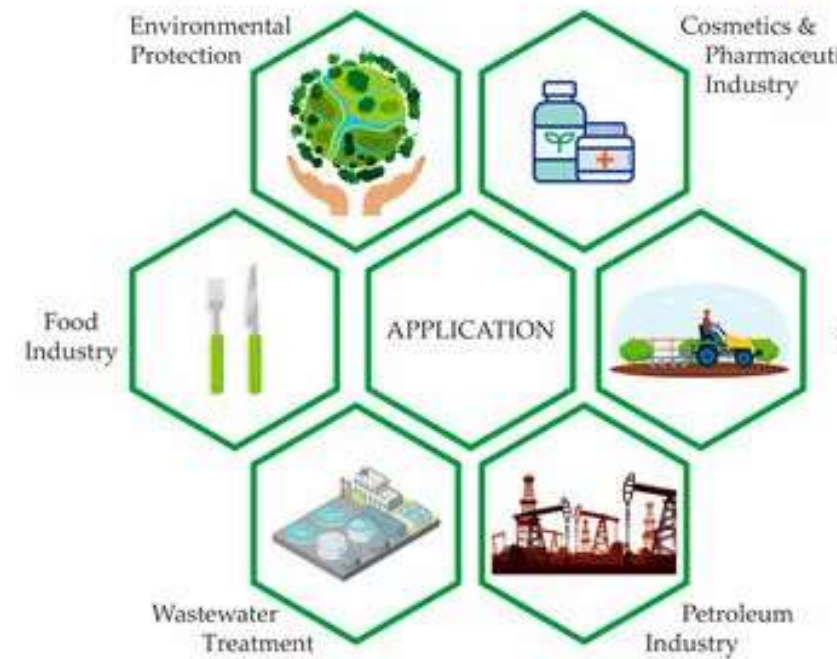
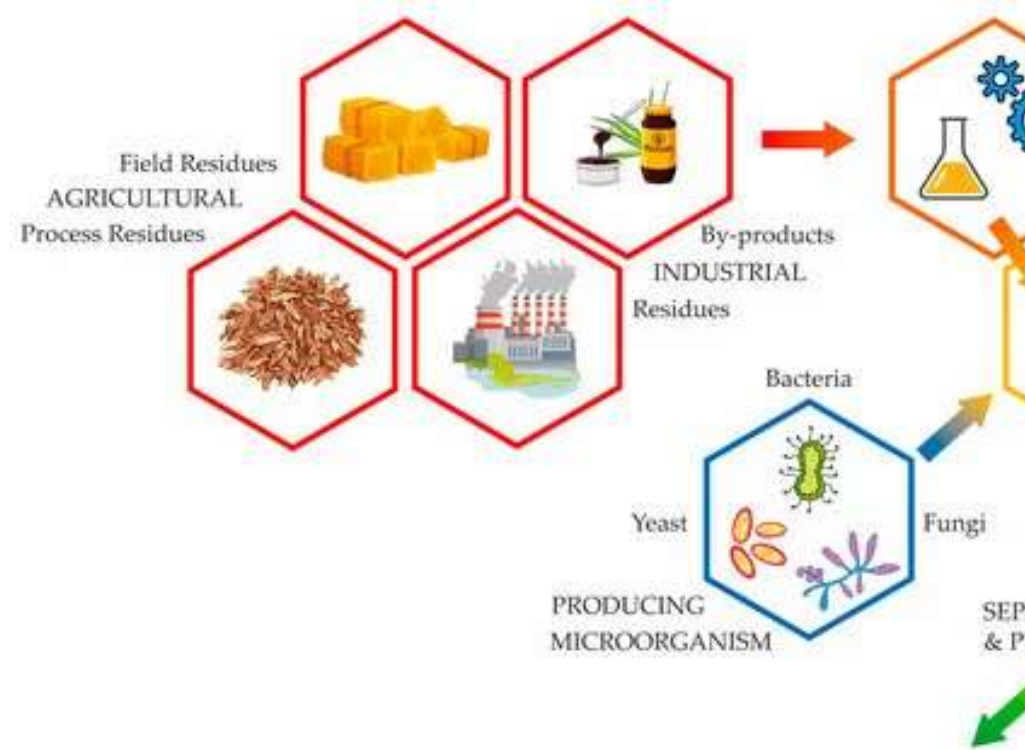


Food & agricultural bioprocess residues

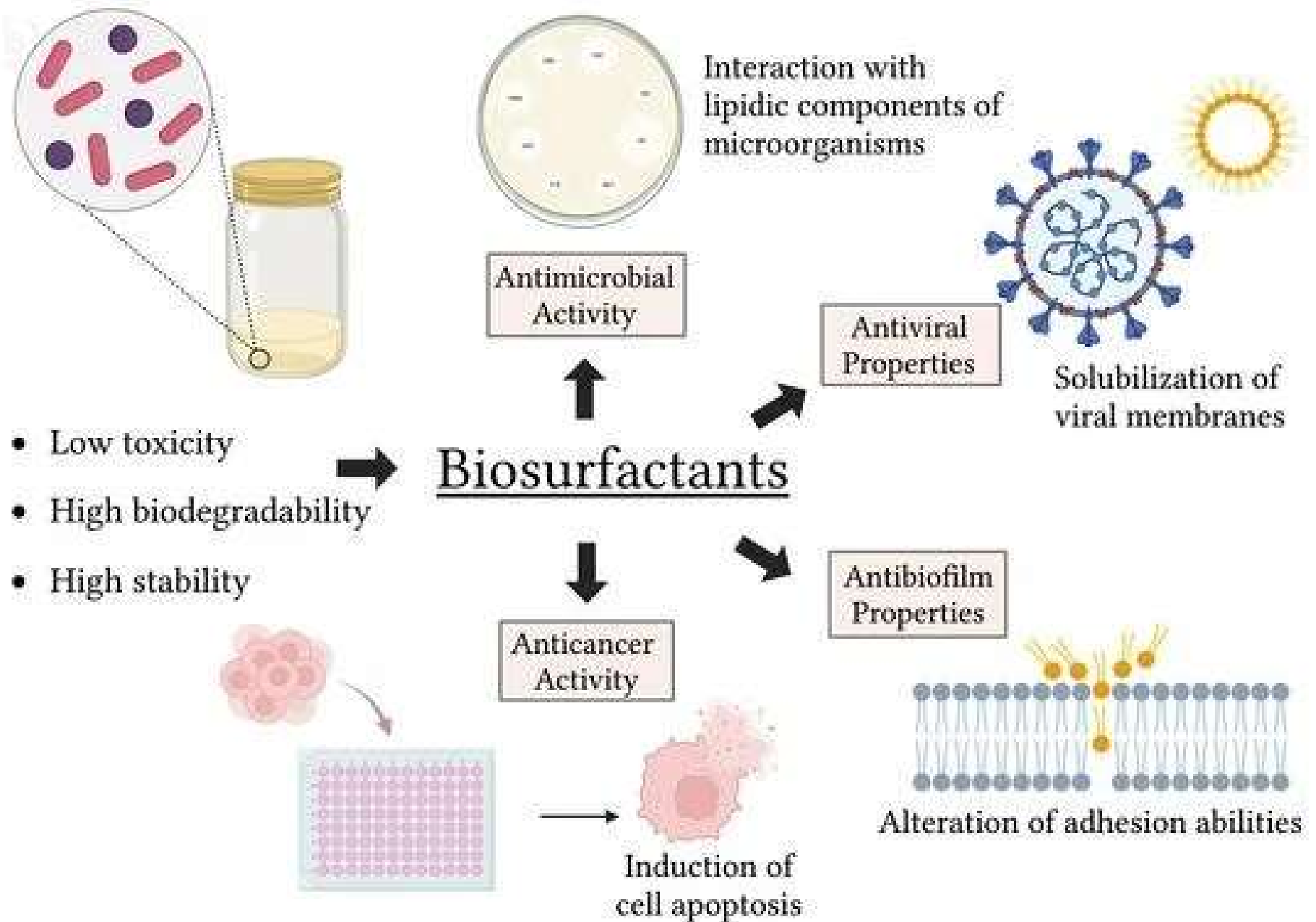
Industrial residues

Waste water

Bioprocess needs ENERGY



Microbial Biosurfactants: Antimicrobial Activity and Potential Biomedical and Therapeutic Exploits



We need food or agriculture wastes:

- enriched in sugars
- enriched in lipids
- purified water from waste
- lost cost energy for
 - pretreatment of the biomass/agriculture/food wastes
 - Bioprocess: fermentation
 - Downstream processes