P Grundlagen der Biologie I - Part Microbiology
Concepts FS17

Chapter 1
Bunsen burner as a measure to provide a semi-sterile working environment
Autoclaving as the most common sterilization technique
Detection of microorganisms by naked eye via the formation of colonies
Dilution and surface streaking to isolate pure cultures (clones, colonies) of microorganisms

Chapter 2
Necessity of sterile working due to abundance of microorganisms in the environment
Selective cultivation conditions to enrich for specific microorganisms
Resistance against antibiotics as a naturally occurring property of microorganisms
Filtration as a method to sterilize liquids
Accumulations of host cells (bacteria) as a source for the isolation of host-specific viruses (bacteriophages)
Detection of bacteriophages by naked eye via the formation of plaques in a bacterial lawn

Chapter 3
Morphological, physiological, biochemical and genetic properties to differentiate between and ultimately identify microorganisms

Chapter 4
Morphology of microorganisms (bacteria and fungi) as adaptation to absorptive nutrition mode
Eukaryotic nature of fungi with possibility of sexual reproduction
Distribution of fungi (and bacteria) over time and space by spores
Asexual and sexual production of fungal spores
Coupling of sexual production of fungi with formation of macroscopic structures (fruiting bodies)

Chapter 5
Antibiotics as a means of microorganisms to defend themselves against competitors
Bacteria and fungi as producers of antibiotics
Different susceptibility of different microorganisms to different antibiotics
Plant defense against microorganisms by antimicrobial metabolites
Animal defense against microorganisms by antimicrobial enzymes

Chapter 6
Light scattering (absorption) as a method for following microbial growth in suspension
Absorption as unifying nutrition mode of microorganisms
Light as a signal (and energy source) for microorganisms
Nutritional variability and flexibility as main feature of microorganisms
Plethora of interactions of microorganisms among themselves and with plants and animals
Horizontal gene transfer as one way of rapid adaptation of microorganisms to changing environments
LacZ-fusions as common method to measure gene expression