**Hoofdstuk 1:**

**Agar:** A polymer of galactose that is used as a gelling agent.

**Antibiotic**: A molecule that can kill or inhibit the growth of selected microorganisms.

**Antiseptic**: A chemical that kills microbes.

**Archaea**: One of the three domains of life, consisting of organisms with a last common ancestor not shared with members of Bacteria or Eukarya. Organisms are prokaryotic (lacking nuclei, unlike eukaryotes) and possess ether-linked phospholipid membranes (unlike bacteria).

**Archaeon**: Singular of archaea.

**Aseptic**: An environment that is free of microbes.

**Autoclave**: An appliance that uses pressurized steam to sterilize materials by raising the temperature above the boiling point of water at standard pressure.

**Bacteria**: One of the three domains of life, consisting of organisms with a last common ancestor not shared with members of Archaea or Eukarya. Organisms are prokaryotic (lacking nuclei, unlike eukaryotes) and possess ester-linked phospholipid membranes (unlike archaea).

**Bacterium**: Singular of bacteria.

**Chain** **of** **infection**: The serial passage of a pathogenic organism from an infected individual to an uninfected individual, thus transmitting disease.

**Colonies**: Visible clusters of microbes on a plate, all derived from a single founding microbe.

**DNA** **sequencing**: A technique to determine the order of bases in a DNA sample.

**Electron** **microscope**: A microscope that obtains high resolution and magnification by focusing electron beams on samples using magnetic lenses.

**Endosymbiont**: An organism that lives as a symbiont inside another organism.

**Enrichment** **culture**: The use of selective growth media to allow only certain microbes to grow.

**Eukarya**: One of the three domains of life, consisting of organisms with a last common ancestor not shared with members of Archaea or Bacteria. Cells possess nuclei, unlike cells of bacteria and archaea.

**Eukaryote**: A cell that contains a nucleus and is a member of the domain Eukarya.

**Fermentation**: The production of ATP via substrate level phosphorylation, using organic compounds as both electron donors and electron acceptors.

**Genoom**: The complete genetic content of an organism. The sequence of all the nucleotides in a haploid set of chromosomes.

**Geochemical** **cycling**: The global interconversion of various inorganic and organic forms of elements.

**Germ** **theory** **of** **disease**: The theory that many diseases are caused by microbes.

**Immune** **system**: An organism's cellular defense system against pathogens.

**Immunity**: The resistance to a specific disease.

**Immunization**: The stimulation of an immune response by deliberate inoculation with a weakened pathogen, in hopes of providing immunity to disease caused by the pathogen.

**Koch’s** **postulates**: Four criteria that should be met for a microbe to be designated the causative agent of an infectious disease.

**Lithotroph**: An autotrophic organism that gains energy by oxidizing inorganic compounds; also chemoautotroph.

**Microbe**: An organism or virus too small to be seen with the unaided human eye.

**Monophyletic**: A group of organisms that includes an ancestral species and all of its descendents.

**Nitrogen** **Fixation**: The ability of some prokaryotes to reduce inorganic diatomic nitrogen gas (N2) to two molecules of ammonium ion (2 NH4+).

**Petri-dish**: A round dish with vertical walls covered by an inverted dish of slightly larger diameter. The smaller dish can be filled with a substrate for growing microbes.

**Photosynthesis**: The metabolic ability to absorb and convert solar energy into chemical energy for biosynthesis; a precise definition includes CO2 fixation.

**Polyphyletic**: An organism or group of organisms that have multiple evolutionary origins.

**Prokaryotes**: Organism whose cell or cells lack a nucleus; includes both bacteria and archaea.

**Pure** **culture**: A culture containing only a single strain or species of microorganism. A large number of microorganisms all descended from a single individual cell.

**Recombinant** **DNA**: DNA that has been combined with other DNA to create novel DNA sequences.

**Reduced**: A reduced compound is one that has gained electrons. Reduction is the gain of electrons.

**Restriction** **endonuclease**: A bacterial enzyme that cleaves double-stranded DNA within a specific short sequence, usually a palindrome. Often called a restriction enzyme.

**Spontaneous** **generation**: The theory, much debated in the nineteenth century, that under current Earth conditions life can arise spontaneously from non-living matter.

**Transformation**: DNA that has been combined with other DNA to create novel DNA sequences.

**Ultracentrifuge**: A machine that exposes samples to high centrifugal forces and can be used to separate subcellular components.

**Vaccination**: Exposure of an individual to a weakened version of a microbe to provoke immunity and prevent development of disease upon re-exposure.

**Virus**: An acellular particle containing a genome that can replicate only inside a cell.

**Winogradsky** **column**: A tube containing a stratified environment that causes specific microbes to grow at particular levels; a type of enrichment culture for the growth of microbes from wetland environments.

**Hoofdstuk 2:**

**Aberration**: An imperfection in a lens.

**Absorption**: In optics, the capacity of a material to absorb light.

**Acid-fast** **stain**: A diagnostic stain for mycobacteria, which retain the dye fuchsin due to the presence of mycolic acids in the cell wall.

**Airy** **disk**: A bright central point surrounded by rings of light and dark caused by the pattern of interference of spherical wavefronts converging at the focal point.

**Angle** **of** **aperture**: The width of a light cone (theta, Θ) that projects from the midline of a lens. Greater angles of aperture increase resolution.

**Antibody** **stain**: The attachment of a stain to an antibody to visualize cell components recognized by the antibody with high specificity.

**Artifact**: A structure viewed through a microscope that is incorrectly interpreted.

**Atomic** **Force** **Mircroscopy**: A technique that maps the three dimensional topography of a object using van der Waals forces between the object and a probe.

**Bacillus**: A bacterium with a linear, rod-like shape.

**Bright-field** **Microscopy**: A type of light microscopy in which the specimen absorbs light and appears dark against a light background.

**Coccus**: A spherically shaped microbial cell.

**Compound** **Microscope**: A microscope with multiple lenses to compensate for lens aberration and increase magnification.

**Condenser**: A lens that focuses parallel light rays from the light source onto a small area of the specimen to improve the resolution of the objective lens.

**Contrast**: Differential absorption or reflection of electromagnetic radiation between an object and background that allows the object to be distinguished from the background.

**Counterstain**: A secondary stain used to visualize cells that do not retain the first stain.

**Cryocrystallography**: X-ray crystallography on crystals that are flash-cooled in liquid nitrogen.

**Cryoelectron** **microscopy**: Electron microscopy in which the sample is cooled rapidly in a cryoprotectant medium that prevents freezing. The sample does not need to be stained.

**Dark-field** **microscopy**: The detection of microbes too small to be resolved by light rays by observing the light they scatter.

**Depth** **of** **field**: A region of the optical column over which a specimen appears in reasonable focus.

**Detection**: The ability to determine the presence of an object.

**Diaphragm**: A device in a microscope to vary the diameter of the light column, changing the amount of light admitted.

**Differential** **stain**: A stain that differentiates among objects by staining only particular types of cells or specific sub-cellular structures.

**Electron** **microscopy**: A microscope that obtains high resolution and magnification by focusing electron beams on samples using magnetic lenses.

**Emission** **wavelength**: The wavelength of light emitted by a fluorescent molecule. It is of a lower energy and longer wavelength than the excitation wavelength.

**Empty** **magnification**: Magnification without an increase in resolution.

**Excitation** **wavelength**: The wavelength of light that must be absorbed by a molecule in order for the molecule to fluoresce.

**Fixation**: The adherence of cells to a slide by a chemical or heat treatment.

**Flagella**: A filamentous structure for motility. In prokaryotes, a helical protein filament attached to a rotary motor; in eukaryotes, an undulating cell membrane-enclosed complex of microtubules and ATP driven motor proteins.

**Fluorescence**: The emission of light from a molecule that absorbed light of a shorter, higher energy wavelength.

**Fluorophore**: A fluorescent molecule used to stain specimens for fluorescent microscopy.

**Focal** **plane**: A plane that contains the focal point for a given lens.

**Focal** **point**: The position at which light rays that pass through a lens intersect.

**Focus**: A group of cells infected by a virus.

**Gram** **stain**: A differential stain that distinguishes between cells that possess a thick cell wall and retain a positively-charged stain (gram-positive) from cells with a thin cell wall and outer membrane that fail to retain the stain (gram-negative).

**Gram-negative**: Cells that do not retain the Gram stain.

**Gram-positive**: Cells that do retain the Gram stain and appear dark purple after staining.

**Immersion** **oil**: An oil with a refractive index similar to glass that minimizes light ray loss at wide angles, thereby minimizing wavefront interference and maximizing resolution.

**Interference**: The interaction of two wave fronts; can be additive (amplitudes in phase, constructive) or subtractive (amplitudes out of phase, destructive).

**Interference** **microscopy**: Observation of an object using contrast enhanced by superimposing interference bands upon an image to accentuate small differences in refractive indexes.

**Laser** **scanning** **confocal** **microscopy**: A type of fluorescence microscopy in which the excitation and emitted light are focused together, producing high resolution images.

**Light** **microscopy**: Observation of a microscopic object based on light absorption and transmission.

**Magnification**: An increase in the apparent size of a viewed object as an optical image.

**Microscope**: A tool that increases the magnification of specimens to enable viewing at higher resolution.

**Mordant**: A chemical binding agent that causes specimens to retain stains better.

**Negative** **stain**: A stain that colors the background and leaves the specimen unstained.

**NMR**: A technique that provides structural information based on the absorption and emission of electromagnetic radiation resulting from changes in the spin state of atomic nuclei.

**Numerical** **aperture**: The product of the refractive index of the medium and sin Θ. As NA increases the magnification increases.

**Objective** **lens**: In a compound microscope, the lens closest to the specimen that generates the initial magnification.

**Ocular** **lens**: In a compound microscope, the lens situated closest to the observer's eye. It is also called the eyepiece.

**Parfocal**: In a microscope with multiple objective lenses, having the objective lenses set at different heights that maintain focus when switching among lenses.

**Reflection**: Deflection of an incident light ray by an object, at an angle equal to the incident angle.

**Refraction**: The bending and slowing of light as it passes through a substance.

**Refractive** **index**: The degree to which a substance causes the refraction of light, a ratio of the speed of light in a vacuum to its speed in another medium.

**Resolution**: The smallest distance that two objects can be separated and still be distinguished as separate objects.

**Rods:** 1. A bacteria with a linear shape (also referred to as a bacillus)

2. A photoreceptor cell .

**Scanning** **electron** **microscopy**: Electron microscopy in which the electron beams scan across the specimen's surface to reveal the three-dimensional topology of the specimen.

**Scattering**: Interaction of light with an object resulting in propagation of spherical light waves at relatively low intensity.

**Simple** **stain:** A stain that makes an object more opaque, increasing its contrast with the external medium or surrounding tissue.

**Spirochete**: A bacterium with a tight, flexible spiral shape; a species of the phylum Spirochetes (Spirochaetes).

**Spore** **stain**: A type of differential stain that is specific for the endospore coat of various bacteria, typically a firmicute species.

**Staining**: The process of treating microscopic specimens with a stain to enhance their detection or to visualize specific cell components.

**Tomography**: The acquisition of projected images of a transparent specimen from different angles that are digitally combined to visualize the entire specimen.

**Total** **magnification**: The magnification of the ocular lens multiplied by the magnification of the objective lens.

**Transmission** **electron** **microscopy**: A type of electron microscopy in which electron beams are transmitted through a thin specimen to reveal internal structure.

**Wet** **mount**: A technique to view living microbes with a microscope by placement of the microbes in water on a slide under a coverslip.

**X-ray** **crystallography**: A technique to determine the positions of atoms (atomic coordinates) within a molecule or molecular complex, based upon the diffraction of X-rays by the molecule.

**X-ray** **diffraction** **analysis**: Also X-ray crystallography.

**Hoofdstuk 3:**

**Active** **transport**: An energy-requiring process that moves molecules across a membrane against their electro-chemical gradient.

**Adherence**: The ability of an organism to attach to a substrate.

**ATP** **synthesase**: A protein complex that synthesizes ATP from ADP and inorganic phosphate using energy derived from the transmembrane proton potential. It is located in the prokaryotic cell membrane and in the mitochondrial inner membrane.

**Capsule**: A slippery outer layer composed of polysaccharides that surrounds the cell envelope of some bacteria.

**Carboxysome**: A protein-bounded compartment containing rubisco to fix CO2.

**Cardiolipin**: A double phospholipids linked by glycerol.

**Cellmembrane**: The phospholipid bilayer that encloses the cytoplasm.

**Cell** **wall**: A rigid structure external to the cell membrane. The molecular composition depends on organism; composed of peptidoglycan in bacteria.

**Chaperone**: A protein that helps other proteins fold into their correct tertiary structure.

**Chemotaxis**: The ability of organisms to move towards or away from specific chemicals.

**Cholesterol**: A sterol lipid found in eukaryotic cell membranes.

**Contractile** **vacuole**: An organelle in eukaryotic microbes that pumps water out of the cell.

**Core** **polysaccharide**: A sugar chain that attaches to the glucosamine of lipopolysaccharides and extends outside the cell.

**Cross**-**bridge**: An attachment that links parallel molecules such as the peptide link between glycan chains in peptidoglycan.

**Electrochemical** **potential**: A type of potential energy formed by the combined concentration gradient of a molecule and the electrical potential across a membrane.

**Electrophoresis**: A technique to separate charged proteins and nucleic acids based on how rapidly they migrate in an electric field through a gel.

**Endotoxin**: Lipopolysaccharides in the outer membrane of gram negative bacteria that become toxic to the host after the bacterial cell has lysed.

**Envelope**: Structures external to the cell membrane such as a cell wall or outer membrane.

**Flagellum**: A filamentous structure for motility. In prokaryotes, a helical protein filament attached to a rotary motor; in eukaryotes, an undulating cell membrane-enclosed complex of microtubules and ATP driven motor proteins.

**Gas** **vesicle**: An organelle that traps gasses to increase buoyancy of aquatic microbes.

**Genetic** **analysis**: Determination of the function of cell RNAs and proteins based on the phenotype of cells in which the gene encoding the RNA or protein is mutated.

**Glucosamine**: A glucose modified with an amine group.

**Helicase**: A protein that unwinds the DNA helix.

**Holdfast**: Adhesion factors secreted by the tip of a stalk to firmly attach an organism to a substrate.

**Hopane**: Five-ringed hydrocarbon lipids found in bacterial cell membranes.

Inner membrane: In gram-negative bacteria, the membrane in contact with the cytoplasm, equivalent to the cell membrane.

**Isoelectric** **focusing**: A technique that separates proteins based on their charge.

**Leaflet**: One of the two lipid layers in a phospholipid bilayer. The inner leaflet of the cell membrane faces the cytoplasm.

**Lipopolysaccharide** (**LPS**): Structurally unique phospholipids found in the outer leaflet of the outer membrane in gram-negative bacteria. Many are endotoxins.

**Lysate**: The contents of broken cells; may include virus particles.

**Magnetosome**: An organelle containing the mineral magnetite that allows microbes to sense a magnetic field.

**Magnetotaxis**: The ability to direct motility along magnetic field lines.

**Membrane**-**permeant** **weak** **acid**: An acid that exists in charged and uncharged forms such as acetic acid. The uncharged form can cross the membrane.

**Membrane**-**permeant** **weak** **base**: A base that exists in charged and uncharged forms such as methylamine. The uncharged form can dissolve in the membrane.

**Motility**: The ability of a microbe to generate self-directed movement.

**Murein** **lipoprotein**: The major lipoprotein that connects the outer membrane of gram-negative bacteria to the peptidoglycan cell wall.

**Nucleoid**: The looped coils of a bacterial chromosome.

**O** **polysaccharide**: A sugar chain that connects to the core polysaccharide of lipopolysaccharides.

**Origin** **of** **replication**: A DNA sequence at which DNA replication initiates. In a bacterial chromosome this site is also attached to the cell envelope.

**Osmosis**: The diffusion of water from regions of high water concentration (low solute) to regions of low water concentration (high solute) across a semi-permeable membrane.

**Osmotic** **pressure**: Exerted by the flow of water through a semipermeable membrane.

**Outer** **membrane**: A membrane external to the cell wall in gram-negative bacteria.

**Passive** **transport**: Net movement of molecules across a membrane without energy expenditure by the cell.

**Pellicle**: A thick, flexible cell covering found in protists.

**Peptidoglycan**: A polymer of peptide-linked chains of amino sugars; a major component of the bacterial cell wall.

**Permissive** **temperature**: A temperature at which a temperature sensitive mutation in a gene is masked, permitting growth of the organism.

**Phosphatidate**: A negatively charged phosphate head group of a phospholipid.

**Phosphatidylethanolamine**: A type of phospholipid with a positively charged ethanolamine attached to the phosphate group.

**Phoshatidylglycerol**: A type of phospholipid with a glycerol attached to the phosphate group.

**Phycobilisome**: A protein complex that captures light in photosynthetic bacteria.

**Pilin**: The protein monomer that polymerizes to form a pilus.

**Pilus**: A straight protein filament composed of a tube of protein monomers that extend from the bacterial cell envelope.

**Polyamine**: A positively charged molecule containing multiple amine groups.

**Polysome**: A cell structure consisting of multiple ribosomes performing translation on the same mRNA molecule.

**Porin**: A transmembrane protein complex that allows movement of specific molecules across the cell membrane or the outer membrane.

**Proteome**: All the proteins expressed in a cell at a given time. The "complete" includes all the proteins the cell can express under any condition. The "expressed" represents the set of proteins made under a given condition.

**Reductive** **evolution**: The loss or mutation of DNA encoding unselected traits.

**Replisome**: A complex of DNA polymerase and other accessory molecules that performs DNA replication.

**Restrictive** **temperature**: A temperature at which a temperature- sensitive mutation in a gene leads to the mutant phenotype, which generally includes failure to grow.

**Sacculus**: The single covalent molecule that comprises the bacterial cell wall.

**Sedimentation** **rate**: The rate at which particles of a given size and shape travel to the bottom of a tube under centrifugal force. The rate depends on the particle's mass and cross-sectional area.

**Septation**: The formation of a septum, a new section of cell wall and envelope to separate two prokaryotic daughter cells.

**Septum**: A plate of cell wall and envelope that forms to separate two daughter cells.

**Sex** **pilus**: A pilus specialized for DNA transfer between bacteria.

**Signal** **recognition** **particle**: A receptor that recognizes the signal sequence of peptides undergoing translation. The complex attaches to the cell membrane of prokaryotes (or the rough endoplasmic reticulum of eukaryotes), where it docks the protein-ribosome complex to the membrane for protein membrane insertion or secretion.

**S-layer**: A crystalline protein surface layer replacing or external to the cell wall in many species of archaea and bacteria.

**Solutes**: Any dissolved molecule.

**Stalk**: An extension of the cytoplasm and envelope that attaches a microbe to a substrate.

**Staphylococcus**: A hexagonal arrangement of cells formed by septation in random orientations.

**Subcellular** **fractionation**: A procedure to separate cell components; often includes ultracentrifugation.

**Supercoils**: An extra twist or turn found in DNA, either positive (increases DNA winding) or negative (decreases DNA winding).

**Svedberg** **coefficient**: A measure of particle size based on the particle's sedimentation rate in a tube subjected to a high g force.

**Teichoic** **acids**: Chains of phosphodiester-linked glycerol or ribitol that thread through and reinforce the cell wall in gram-positive bacteria.

**Terpenoid**: A branched lipid derived from isoprene that is found in hydrocarbon chains of archaeal membranes.

**Thylakoid**: A chlorophyll-containing membrane folded within a phototrophic bacterium or a chloroplast.

**Transport** **protein**: A membrane protein that moves specific molecules across a membrane.

**2D** **polyacrylamide** **gel** **electrophoresis**: A technique to separate proteins based on differences in charge and molecular weight.

**Ultracentrifuge**: A machine that exposes samples to high centrifugal forces and can be used to separate subcellular components.

**Hoofdstuk 4:**

**ABC transporter**: An ATP powered transport system that contains an ATP binding cassette.

**Antiport**: A transport protein in which the molecules being transported move in opposite directions across the membrane.

**Autotroph**: An organism that can reduce carbon dioxide to produce organic carbon for biosynthesis.

**Axentic** **growth**: The ability of an organism to grow in the absence of any other species, as, for example, in a pure culture.

**Batch** **culture**: The growth of bacteria in a closed system without inputs of nutrients.

**Binary** **fission**: The process of replication in which one cell divides to form two daughter cells of equal size.

**Biofilm**: A community of microbes growing on a solid surface.

**Chemoautotroph**: An organism that oxidizes inorganic compounds to yield energy and reduce carbon dioxide.

**Chemoautotrophy**: The oxidation of inorganic compounds to yield energy used to reduce carbon dioxide.

**Chemoheterotroph**: An organism that oxidizes organic compounds to yield energy.

**Chemoheterotrophy**: The oxidation of organic compounds to yield energy without the use of light.

**Chemostat**: A continuous culture system in which the introduced media contains a limiting nutrient.

**Chemotrophy**: Metabolism that yields energy from oxidation-reduction reactions without using light energy.

**Cofactor**: A metallic ion or a coenzyme required by an enzyme to perform normal catalysis.

**Colony**: A visible cluster of microbes on a plate, all derived from a single founding microbe.

**Complex** **medium**: A nutrient-rich growth solution including undefined chemical components such as beef broth.

**Confluent**: A lawn of organisms that have completely covered a surface.

**Continuous** **culture**: A culture system in which new medium is continually added to replace old medium.

**Coulter** **counter**: A device to count cells based on increasing electrical resistance as cells pass through a small hole.

**Coupled** **transport**: The movement of a substance against its electrochemical gradient (from lower to higher concentration, or from opposite charge to like charge) using the energy provided by the simultaneous movement of a different chemical down its electrochemical gradient.

**Death** **phase**: The period of cell culture following stationary phase, in which cells die faster than they replicate.

**Death** **rate**: The rate at which cells die; exponential during the death phase.

**Defined** **minimum** **medium**: A solution of known compounds for organismal growth that contains only the minimal components required for growth.

**Denitrification**: Energy-yielding metabolism that involves the reduction of nitrate (NO3 -) to nitrite (NO2 -), diatomic nitrogen, N2, and in some cases ammonia (NH3).

**Differential** **medium**: A growth medium that can distinguish between various bacteria based on metabolic differences.

**Dilution** **streaking**: A method of spreading of bacteria on a plate in order to obtain colonies arising from an individual bacterium.

**Doubled** **time**: The generation time of bacteria in culture. The amount of time it takes for the population to double.

**Elektrogenic**: A transport system that results in a net movement of charged molecules across a membrane.

**Electroneutral**: A transport system that does not result in any net change in charge across the membrane.

**Endosome**: A vesicle formed from the pinching in of the cell membrane.

**Enriched** **medium**: A growth solution for fastidious bacteria, consisting of complex media plus additional components.

**Essential** **nutrient**: A compound that an organism cannot synthesize and must acquire from the environment in order to survive.

**Exopolysacchariden** (**EPS**): A thick extracellular matrix of polysaccharides and entrapped materials that forms around the microbes in a biofilm.

**Exponential** **phase**: A phase in bacterial cell culture when bacteria are growing at their maximal possible rate given the conditions, usually exponentially.

**Fluorescence**-**activated** **cell** **sorter**: A device that can count cells and sort them based on differences in fluorescence.

**Forespore**: In sporulation of gram-positive bacteria, the smaller cell compartment formed through asymmetrical cell division; it develops into the endospore.

**Generation** **time**: The species-specific time period for doubling of a population (for example, by bacterial cell division) in an given environment, assuming no depletion of resources.

**Germination**: The activation of a dormant spore to generate a vegetative cell.

**Gliding** **motility**: The movement of cells individually or as a collective over surfaces using pili.

**Group** **translocation**: A form of active transport in which the transported molecule is modified after it enters the cell, thus keeping a favorable inward concentration gradient for the unmodified extracellular molecule.

**Growth** **factor**: A compound needed for the growth of only certain cells.

**Growth** **rate**: The rate of increase in population number or biomass.

**Heterotroph**: An organism that relies on external sources of organic carbon compounds for biosynthesis.

**Lag**-**phase**: A phase of slow growth or no growth right after bacteria are inoculated into new media.

**Lithotroph**: An autotrophic organism that gains energy by oxidizing inorganic compounds.

**MacConkey** **medium**: A differential, selective medium that selects for gram-negative bacteria and can differentiate between lactose fermenters and non-fermenters.

**Macronutrient**: A nutrient an organism needs in large quantities.

**Mean** **growth** **rate** **constant**: The number of organismal generations per unit time, k.

**Membrane** **potential**: Energy stored as an electrical voltage difference across a membrane.

**Microcolony**: A small colony of bacteria only visible with the aid of a microscope.

**Micronutrient**: A nutrient that an organism needs in small quantity, typically a vitamin or a mineral.

**Mitosis**: The orderly replication and segregation of eukaryotic chromosomes, usually prior to cell division.

**Mixotrophic**: An organism that can switch among metabolic strategies, such as heterotrophy and phototrophy, depending on the environmental conditions.

**Mother** **cell**: The larger cell that forms during the asymmetric cell division leading to spore formation. The mother cell will engulf the forespore.

**Mycelium**: A fungal hypha that projects into the air (aerial mycelium) or into the growth substrate (substrate mycelium).

**Nitrification**: The oxidation of reduced nitrogen compounds to nitrite or nitrate.

**Nitrogen**-**fixing** **bacterium**: A bacterium that can reduce diatomic nitrogen gas, N2, into ammonium ion (NH4+) .

**Optical** **density**: A measure of how many particles are suspended in a solution based on light scattering by the suspended particles .

**Permease**: A substrate-specific carrier protein in the membrane.

**Phagocytosis**: A form of endocytosis in which large extracellular particles are brought into the cell.

**Phagosome**: A large intracellular vesicle that forms as a result of phagocytosis .

**Phosphotransferase** **system**: A group translocation system that uses phosphoenol pyruvate to transfer phosphoryl groups onto the incoming molecule.

**Photoautotroph**: Organisms that perform photosynthesis, using light energy to reduce carbon dioxide.

**Photoautotrophy**: The reduction of carbon dioxide using light as an energy source.

**Photoheterotrophy**: The production of energy by the photolysis of organic compounds.

**Phototrophy**: Obtaining energy from chemical reactions triggered by the absorption of light.

**Pinocytosis**: A form of endocytosis in which only extracellular fluid and small molecules are brought into the cell.

**Planktonic** **cells**: Isolated cells, growing individually in a liquid without connections to other cells.

**Pour** **plate**: Also known as a Petri dish, a round, shallow-sided container into which molten agar is poured and subsequently cooled .

**Pure** **culture**: A culture containing only a single strain or species of microorganism. A large number of microorganisms all descended from a single individual cell.

**Quorum** **sensing**: The ability of bacteria to sense the presence of other bacteria via secreted chemical signals called autoinducers.

**Selective** **medium**: A medium that allows the growth of certain species or strains of organisms but not others .

**Siderophore**: A high-affinity iron binding protein used to scavenge iron from the environment and deliver it to the siderophore-producing organism.

**Spread** **plate**: A method to grow separate bacterial colonies by plating serial dilutions of a liquid culture.

**Stationary** **phase**: A period of no net increase in replication that follows the exponential growth phase.

**Substrate**-**binding** **protein**: An extra-cytoplasmic protein that binds specific substrates and delivers them to their cognate uptake ABC transporters.

**Symbiont**: An organism that lives in a close association with another organism.

**Symport**: A transport protein where the molecules being transported move in the same direction across the membrane.

**Synthetic** **medium**: A bacterial growth solution that contains defined, known components.

**Turbidostat**: A continuous culture device that can measure optical density and through changing culture flow rates, maintain a specific cell density.

**Twitching** **motility**: A type of bacterial movement on solid surfaces where a specific pilus extends and retracts.

**Viable**: An organism that can replicate, for instance by forming a colony on an agar plate.

**Viable** **but** **nonculturable**: An organism that is metabolically active but can not replicate to form a colony on a plate by current means of culture. Also called a dormant cell.

**Hoofdstuk 5:**

**Acidophile**: An organism that grows fastest in acid (generally defined as below pH 5).

**Aerobic** **respiration**: The use of oxygen as the terminal electron acceptor in an electron transport chain. A proton gradient is generated and used to drive ATP synthesis.

**Alkaliphile**: An organism with optimal growth in alkali (generally defined as above pH 9).

**Anaerobic** **respiration**: The use of a molecule other than oxygen as the final electron acceptor of an electron transport chain.

**Antibiotic**: A molecule that can kill or inhibit the growth of selected microorganisms.

**Antisepsis**: The removal of pathogens from living tissues.

**Bactericidal**: An agent that kills bacterial cells.

**Bacteriostatic**: An agent that inhibits the growth of bacterial cells.

**Barophile**: An organism that requires high pressure to grow.

**Bioremediation**: The use of microbes to detoxify environmental contaminants.

**Decimal** **reduction** **time** (**D**-**value**): The length of time it takes for a treatment to kill 90% of a microbial population, and hence a measure of the efficacy of the treatment.

**Disinfection**: The removal of pathogenic organisms from inanimate surfaces.

**DNA** **microarray**: A microchip containing short DNA sequences corresponding to all the open reading frames in an organism affixed to specific locations. It can be used to measure the amount of specific mRNA molecules transcribed in cells.

**Electron** **transport** **system** (**ETS**): A collection of membrane proteins that converts the energy of redox reactions into a proton potential.

**Eutrophication**: A sudden increase of a formerly limiting nutrient in an aquatic environment, leading to overgrowth of algae and grazing bacteria and subsequent oxygen depletion.

**Extremophile**: An organism that only grows in an extreme environment; that is, an environment including one or more conditions that are "extreme" relative to the conditions for human life.

**Facultative**: An organism that can grow in the presence or absence of a given environmental factor, such as oxygen.

**Facultative** **aerobe**: An organism that can grow either in the presence or absence of oxygen.

**Fermentation**: The production of ATP via substrate level phosphorylation, using organic compounds as both electron donors and electron acceptors.

**Germicidal**: A substance that kills cells but not spores.

**Halophile**: An organism that requires a high extracellular sodium chloride concentration for optimal growth.

**Heat** **shock** **response**: A coordinated response of cells to higher than normal temperatures. It includes changes in the membrane and expression of heat shock genes.

**Hyperthermophile**: An organism with optimum growth at extremely high temperatures (generally considered as above 80°).

**Laminar** **flow** **biological** **safety** **cabinet**: An air filtration appliance that removes pathogenic microbes from within the cabinet.

**Lyophilisation**: A method to freeze-dry microbes or food for long term storage.

**Membrane**-**permeant** **weak** **acid**: An acid that exists in charged and uncharged forms such as acetic acid. The uncharged form can cross the membrane.

**Mesophile**: An organism with optimal growth between 20°C and 40°C.

**Microaerophilic**: An organism that requires oxygen at a concentration lower than that of the atmosphere, and can not grow in high oxygen environments.

**Neutralophile**: An organism with an optimal growth range in environments between pH 5 and 8.

**Oligotroph**: An organism that can only grow in environments containing extremely low concentrations of organic nutrients.

**Osmolarity**: A measure of the number of solute molecules in solution.

**Pasteurization**: The heating of food at a temperature and time combination that will kill spores of Mycobacterium tuberculosis and Coxiella burnetii.

**Phenol** **coefficient** **test**: A test of the ability of a disinfectant to kill bacteria; the higher the coefficient the more effective the disinfectant.

**Piezophile**: An organism that requires high pressure to grow.

**Probiotic**: A food or nutritional supplement that contains live microorganisms and aims to improve health by promoting beneficial bacteria.

**Psychrophile**: An organism with optimal growth at temperatures below 20°C.

**Sterilization**: The destruction of all cells, spores and viruses on an object.

**Strict** **aerobe**: An organism that performs aerobic respiration and can only grow in the presence of oxygen.

**Strict** **anaerobe**: An organism that cannot grow in the presence of oxygen.

**Thermophile**: An organism adapted for optimal growth at high temperatures, usually 55°C or higher.

**2D** **PAGE**: A technique to separate proteins based on differences in charge and molecular weight.

**Water** **activity**: A measure of the water that is not bound to solutes and is available for use by organisms.

**Hoofdstuk 6:**

**Accessory protein**: A protein found in the viral capsid or tegument that is needed early in the viral life cycle.

**Bacteriophage**: A virus that infects bacteria.

**Burst** **size**: The number of virus particles released from a lysed host cell.

**Capsid**: A protein shell that surrounds a virion's nucleic acid.

**Cell** **surface** **receptor**: A transmembrane protein that senses a specific extracellular signal and may be the docking site for a specific virus.

**Cloning** **vector**: A small genome that can carry specific genes for cloning.

**DNA** **reversed**-**transcribing** **virus**: A virus with a double-stranded DNA genome that generates an RNA intermediate and thus requires reverse transcriptase to generate progeny DNA genomes.

**Eclipse** **period**: The time after viral genome injection into host cell but before complete virions are formed.

**Endocytosis**: The budding in of the cell membrane to form a vesicle that contains extracellular material.

**Envelope**: Structures external to the cell membrane such as a cell wall or outer membrane.

**Filamentous** **virus**: A viral structure type consisting of a helical capsid surrounding a single stranded nucleic acid.

**Fluorescent**-**focus** **assay**: An assay to detect viruses that do not kill host cells, based on intracellular detection of viruses using anti-viral antibodies or green fluorescent protein modified viruses.

**Focus**: A group of cells infected by a virus.

**Host** **range**: The species that can be infected by a given pathogen.

**Latent** **period**: The time in the viral life cycle when progeny virions have formed but are still within the host cell.

**Lentivirus**: A member of a family of retroviruses that propagate slowly. An example is HIV.

**Lysate**: The contents of broken cells; may include virus particles.

**Lysogeny**: A viral life cycle in which the viral genome integrates into and replicates with the host genome, but retains the ability to initiate host cell lysis.

**Mechanical** **transmission**: A nonspecific mode of viral entry into damaged tissue.

**Negative**-**sense** **(-)** **strand**: Single-stranded RNA whose sequence is complementary to that of mRNA. Also the DNA strand that is complementary to an mRNA.

**Oncogene**: A gene that through mutation or inappropriate expression can lead to cancer.

**Oncogenic** **virus**: A virus that causes cancer.

**Orthologous** **gene**: A gene present in more than one species that derived from a common ancestral gene and encodes the same function.

**Plaque**: A cell-free zone on a lawn of bacterial cells caused by viral lysis.

**Plaque** **assay**: An assay to determine the presence of bacteriophages based on their ability to form plaques.

**Plaque**-**forming** **unit**: A measure of the concentration of phage particles in liquid culture.

**Plasmodesma**: A membrane channel in plants that connects adjacent plant cells.

**Positive**-**sense** **(+)** **strand**: A molecule of DNA that has the same sequence as mRNA (except for T replacing U). In virology: a molecule of RNA (mRNA) that can be directly translated into viral proteins.

**Prion**: An infectious agent that causes propagation of misfolded host proteins; usually consists of a defective version of the host protein.

**Prophage**: A phage genome integrated into a host genome.

**Proteome**: All the proteins expressed in a cell at a given time. The "complete proteome" includes all the proteins the cell can express under any condition. The "expressed proteome" represents the set of proteins made under a given condition.

**Proteomics**: The biological field of proteome analysis.

**Reading** **frame**: The position in a nucleic acid sequence from which triplet codons encode amino acids.

**Retrovirus**: A virus containing a positive single-stranded RNA genome; uses reverse transcriptase to generate a double-stranded DNA.

**Reverse** **transcriptase**: An enzyme that produces a double-stranded DNA molecule from a single-stranded RNA template.

**Ribozyme**: A catalytic RNA molecule.

**Rise** **period**: During viral culture, the time when cells lyse and viral progeny enter the media.

**RNA**-**dependent** **RNA** **polymerase**: An enzyme that produces an RNA complementary to a template RNA strand.

**Segmented** **genome**: A viral genome that consists of more than one nucleic acid molecule.

**Site**-**specific** **recombination**: Recombination between DNA molecules that do not share long regions of homology but do contain short regions of homology specifically recognized by the recombination enzyme.

**Spike**-**protein**: A viral glycoprotein that connects the membrane to the capsid or the matrix and may be involved in viral binding to host cell receptors.

**Tegument**: The contents of a virion between the capsid and the envelope.

**Temperate** **phage**: Phage capable of lysogeny.

**Transduction**: The transfer of host genes between bacterial cells via a phage head coat.

**Transform**: The conversion of cultured cells into cancer cells.

**Transformed**-**focus** **assay**: The detection of oncogenic viruses based on their ability transform cells, generating foci of unrestricted cell growth.

**Tropism**: The tissue types infected by a specific virus in a given host.

**Viral** **envelope**: A host-derived membrane that surrounds a virus capsid.

**Virion**: A virus particle.

**Viroid**: An infectious naked nucleic acid.

**Virulence**: A measure of the severity of a disease caused by a pathogenic agent.

**Virus**: An acellular particle containing a genome that can replicate only inside a cell.

**Hoofdstuk 13:**

**Activation energy**: The energy needed for reactants to reach the transition state between reactants and products.

**ATP**: A ribonucleotide with three phosphates and the base adenine. It has many functions in the cell including precursor for RNA synthesis and energy carrier.

**Allosteric** **site**: A regulatory site on a biological molecule distinct from the ligand/substrate binding site.

**Amphibolic**: Metabolic pathways that are reversible and can be used for both catabolism and anabolism.

**Anabolisme**: The building up of complex biomolecules from smaller precursors.

**Aromatic**: A ring-shaped organic molecule with π electrons delocalized equally around the ring.

**Catabolism**: The cellular breakdown of large molecules into smaller molecules, releasing energy.

**Catabolite** **repression**: The inhibition of transcription of an operon encoding catabolic proteins in the presence of a more favorable catabolite, such as glucose.

**Coenzyme** **A**: A non-protein cellular organic molecule that can carry acetyl groups and participates in metabolism.

**Dioxygenase**: An enzyme that coordinately oxygenates two adjacent ring carbons.

**Electron** **acceptor**: An oxidized molecule (e.g., NAD+) that can accept electrons.

**Electron** **donor**: A reduced molecule (e.g., NADH) that can donate electrons.

**Electron** **transport** **system**: A collection of membrane proteins that converts the energy of redox reactions into a proton potential.

**Energy**: The ability to do work.

**Enthalpy**: A measure of the heat energy in a system.

**Entropy**: A measure of the disorder in a system.

**Enzyme**: A biological catalyst; a protein or RNA that can speed up the progress of a reaction without itself being changed.

**Gibbs** **free** **energy** **change**: In a chemical reaction, a measure of how much energy available to do work is released or required as the reaction proceeds.

**Phosphorylation**: The enzyme-catalyzed addition of a phosphoryl group onto a molecule.

**Polysaccharide**: A polymer of sugars.

**Terminal** **electron** **acceptor**: The final electron acceptor at the end of an electron transport system.

**Hoofdstuk 14:**

**Anaerobic** **respiration**: The use of a molecule other than oxygen as the final electron acceptor of an electron transport chain.

**Anammox** **reaction**: The anaerobic oxidation of ammonium to nitrogen gas (using nitrate as electron acceptor); yields energy.

**Bacteriochlorophyll**: The chlorophylls of anaerobic phototrophs; they absorb photons most strongly in the far red end of the light spectrum.

**Bacteriorhodopsin**: An archaeal membrane-embedded protein that contains retinal and acts as a light-driven proton pump; homologous to the bacterial proteorhodopsin.

**Carotenoids**: An archaeal membrane-embedded protein that contains retinal and acts as a light-driven proton pump; homologous to the bacterial proteorhodopsin.

**Chlorophyll**: A magnesium-containing pigment that captures light energy at the start of photosynthesis.

**Dehalorespiration**: The reduction of halogenated organic molecules by H2.

**Dissimilatory** **denitrification**: Metabolic reduction of nitrate or nitrite to yield energy; anaerobic respiration of nitrate or nitrite.

**Dissimilatory** **metal** **reduction**: A type of anaerobic respiration that uses metal cations as terminal electron acceptors.

**Electron** **acceptor**: An oxidized molecule (e.g., NAD+) that can accept electrons.

**Electron** **donor**: A reduced molecule (e.g., NADH) that can donate electrons.

**Electron** **transport** **system**: A collection of membrane proteins that converts the energy of redox reactions into a proton potential.

**Hydrogenotrophy**: The use of molecular hydrogen (H2) as an electron donor for a variety of electron acceptors.

**Lithotrophy**: Energy-yielding metabolism that uses an inorganic electron donor; usually includes fixation of CO2 into biomass.

**Methanogen**: An organism that uses hydrogen to reduce CO2 and other single-carbon compounds to methane, yielding energy.

**Methanogenesis**: An energy-yielding metabolic process that produces methane. It is unique to archaea.

**Methanotrophy**: The metabolic oxidation of methane to yield energy.

**Nitrifer**: An organism that converts reduced nitrogen compounds to nitrite or nitrate.

**Oxidoreductase**: An electron transport system protein that accepts electrons from one molecule (oxidizing that molecule), and donates electrons to a second molecule, thereby reducing the second molecule.

**Photoheterotrophy**: The production of energy by the photolysis of organic compounds.

**Photolysis**: The first energy-yielding phase of photosynthesis, the light-driven separation of an electron from a molecule coupled to an electron transport system.

**Photosynthesis**: The metabolic ability to absorb and convert solar energy into chemical energy for biosynthesis; a precise definition includes CO2 fixation.

**Phototrophy**: Obtaining energy from chemical reactions triggered by the absorption of light.

**Proteorhodopsin**: A bacterial membrane protein that contains retinal and acts as a light-driven proton pump; homologous to the archaeal protein bacteriorhodopsin.

**Proton** **potential**: The potential energy of the concentration gradient of protons (hydrogen ions, H+) plus the charge difference across a membrane.

**Respiration**: The oxidation of reduced electron donors through a series of membrane-embedded electron carriers to a final electron acceptor. The energy derived from the redox reactions is stored as an electrochemical gradient across the membrane, which may be harnessed to produce ATP.

**Standard** **reduction** **potential**: A standard value of E, at standard temperature and pressure and assuming initial 1 M concentrations of all reactants and products.

**Hoofdstuk 17:**

**Abiotic**: Produced without organisms; occurring in the absence of life.

**Biosignature**: A chemical indicator of life.

**Biosphere**: The area containing the sum total of all life on Earth.

**Classification**: The recognition of different forms of life and their placement into different categories.

**Coevolution**: The evolution of two species in response to one another.

**Endoliths**: Bacteria that grow within the crystals of solid rock.

**Endosymbiont**: An organism that lives as a symbiont inside another organism.

**Endosymbiosis**: An intimate association between different species in which one partner population grows within the body of another organism.

**Genomic** **island**: A region of DNA sequence whose properties indicate that it has been transferred from another genome. Usually comprises a set of genes with shared function, such as pathogenicity or symbiosis support.

**Genus** **name**: A taxonomic rank consisting of closely related species.

**Greenhouse** **effect**: The trapping of solar radiation heat in the atmosphere by CO2; a cause of global warming.

**Horizontal** **gene** **transfer**: The passage of genes from one cell into another mature cell.

**Identification**: The recognition of the class of a microbe isolated in pure culture.

**Informational** **gene**: A DNA sequence that encodes a product essential for transcription or translation.

**Isolate**: A microbe that has been obtained from a specific location and grown in pure culture.

**Metabolist** **model**: A model of early life in which the central components of intermediary metabolism arose from self-sustaining chemical reactions based on inorganic chemicals.

**Microfossil**: A microscopic fossil in which calcium carbonate deposits have filled in the form of ancient microbial cells.

**Molecular** **clock**: The use of DNA or RNA sequence information to measure the time of divergence among different species.

**Mutualism**: A symbiotic relationship in which both partners benefit.

**Nomenclature**: The naming of different taxonomic groups of organisms.

**Operational** **gene**: A DNA sequence that encodes a product not essential for transcription or translation but involved in cell functions such as metabolism, stress response, or pathogenicity.

**Panspermia**: The hypothesis that life forms originated elsewhere and "seeded" life on Earth.

**Parasitism**: A symbiotic relationship in which one member benefits and the other is harmed.

**Phylogenetic** **tree**: A diagram depicting estimates of the relative amounts of evolutionary divergence among different species.

**Phylogeny**: A measurement of genetic relatedness. The classification of animals based on their genetic relatedness.

**Rank**: A level of taxonomic hierarchy, such as phylum, class, order or family.

**Reductive** **evolution**: The loss or mutation of DNA encoding unselected traits.

**Ribozyme**: A catalytic RNA molecule.

**RNA** **world**: A model of early life in which RNA performed all the informational and catalytic roles of today's DNA and proteins.

**Species**: A single, specific type of organism, designated by a genus and species name.

**Stromatolite**: A mass of sedimentary layers of limestone produced by a marine microbial community over many years.

**Symbiogenesis**: An evolutionary process by which two or more species become intimately associated.

**Symbiosis**: The intimate association of two unrelated species.

**Taxon**: A category of organisms grouped together based on genetic relatedness.

**Taxonomy**: The description of distinct life forms and their organization into different categories.

**Unrooted** **tree**: A phylogenetic tree showing only the relative distances between different species, without indicating which of these diverged earliest from the common ancestor.

**Vertical** **transmission**: The passage of genes from parent to offspring.

**Hoofdstuk 18:**

**Actinobacteria**: A phylum of high GC content gram-positive bacteria.

**Akinete**: A specialized spore cell formed by some filamentous cyanobacteria.

**Arthrospore**: A small vegetative cell, produced by mature mycelia, that gets dispersed.

**Bacteroid**: Cell-wall-less, undividing, differentiated rhizobial cell within a plant cell. The bacteroid provides fixed nitrogen for the plant.

**Bacteroidetes**: A phylum of gram-negative bacteria; nearly all their members are obligate anaerobes.

**Chlamydia**: A phylum of intracellular parasitic bacteria that lose most of their cell envelope during intracellular growth and generate multiple spore-like structures that escape to infect the next host.

**Chlorobi**: A phylum of gram-negative bacteria. They are obligate anaerobes, "green sulfur" phototrophs that photolyze sulfides or H2.

**Chlorosome**: A membranous photosynthetic organelle found in bacterial groups such as Chloroflexus.

**Cyanobacteria**: A phylum of photoautotrophic bacteria containing chlorophylls a and b. They are closely related to chloroplasts.

**Elementary** **body**: The endospore-like form of Chlamydia transmitted outside host cells.

**Endophyte**: An endosymbiont of vascular plants.

**Endospore**: A durable, inert, heat-resistant spore that can remain viable for thousands of years.

**Firmicutes**: A phylum of low GC content gram-positive bacteria.

**Forespore**: In sporulation of gram-positive bacteria, the smaller cell compartment formed through asymmetrical cell division; it develops into the endospore.

**Fruiting** **body**: A multicellular fungal or bacterial reproductive structure.

**Geosmin**: A molecule released from decaying Streptomyces cells; it causes the characteristic odor of soil and can affect the taste of drinking water.

**Hormogonium**: A short motile chain of three to five cells produced by filamentous bacteria to disseminate their cells.

**Leghemoglobin**: An iron-bearing plant protein that sequesters oxygen to maintain an anoxic environment for nitrogenase within cells containing bacteroids.

**Methylotrophy**: The ability of an organism to oxidize single carbon compounds such as methanol, methylamine, or methane.

**Motherspore**: The larger cell that forms during the asymmetric cell division leading to spore formation. The mother cell will engulf the forespore.

**Mycolic** **acid**: One of a diverse class of sugar-linked fatty acids found in the cell envelopes of mycobacteria.

**Nitrospirae**: A phylum of gram-negative bacteria, many of which are lithotrophs, oxidizing nitrite to nitrate.

**Phylum**: The taxonomic rank one level below domain; a group of organisms sharing a common ancestor that diverged early from other groups.

**Planctomycetes**: A phylum of free-living bacteria that have stalked cells and reproduce by budding. Their nucleoid is surrounded by a membrane.

**Proteobacteria**: A large, metabolically and morphologically diverse, phylum of gram-negative bacteria.

**Proteorhodopsin**: A bacterial membrane protein that contains retinal and acts as a light-driven proton pump; homologous to the archaeal protein bacteriorhodopsin.

**Reticulate** **body**: The metabolically and reproductively active form of Chlamydia.

**Sarcina**: A cubical octad cluster of cells formed by septation at right angles to the previous cell division.

**Spirochetes**: A phylum of bacteria with a unique morphology, a flexible, extended spiral that twists via intracellular flagella.

**Swarming**: A behavior in which some microbial cells differentiate into large swarmer cells and swim together as a unit.

**Vegetative** **cell**: A metabolically active, replicating bacterial cell.

**Vegetative** **mycelium**: A branched filament produced by vegetative cells that expands into the substrate.

**Hoofdstuk 19:**

**Bacteriorhodopsin**: An archaeal membrane-embedded protein that contains retinal and acts as a light-driven proton pump; homologous to the bacterial proteorhodopsin.

**Black** **smoker**: An oceanic thermal vent containing high concentrations of minerals such as iron sulfide.

**Crenarchaeota**: One of the two major divisions of Archaea, containing sulfur thermophiles and marine mesophiles.

**Euryarchaeota**: One of the two major divisions of Archaea, containing methanogens, halophiles, and extreme acidophiles.

**Haloarchaeon**: An archaeal species that inhabits high salt environments.

**Halobacteria**: An order of Euryarchaeota that contains haloarchaea.

**Halorhodopsin**: An archaeal light-driven chloride pump.

**Histone**: A protein that helps compact eukaryotic chromosomes in nucleosomes.

**Isoprenoid**: Condensed isoprene chains, found in archaeal membrane lipids.

**Korarchaeota**: A deeply branching division of Archaea.

**Methane** **gas** **hydrate**: A crystalline material in which methane molecules are surrounded by a cage of water molecules. This molecular configuration is found in the deep ocean.

**Methanogen**: An organism that uses hydrogen to reduce CO2 and other single-carbon compounds to methane, yielding energy.

**Nanoarchaeota**: A deeply branching division of Archaea; includes thermophilic cells of extremely small size.

**Pseudomurein**: A peptidoglycan-like molecule composed of sugars and peptides that is found in some archaeal cell walls.

**Thermoproteales**: An order of crenarchaeote containing hyperthermophilic organisms.

**Hoofdstuk 28:**

**Endemic**: A disease that is always present in a population, although the frequency of infection may be low.

**Epidemic**: A disease outbreak in which large numbers of individuals in a population become infected over a short time.

**Index** **case**: Also known as patient zero, the first case of an infectious disease and an important piece of data for helping contain the spread of disease.

**Multiplex** **PCR**: A polymerase chain reaction that uses multiple pairs of oligonucleotide primers to amplify several different DNA sequences simultaneously.

**Pandemic**: An epidemic that occurs over a wide geographic area.

**Quarantine**: The separation of infectious individuals from the general population to limit the spread of infection.

**Reservoir**: 1. An organism that maintains a virus in an area by serving as a high titer host. 2. A part of the biosphere containing significant amounts of an element needed for life.

**Sequelae**: A serious, harmful immunological consequence of bacterial and host antigen cross-reactivity that occur after the infection itself is over. An example is rheumatic fever.

**Hoofdstuk 27:**

**Amphotericin** **B**: An anti-fungal drug that binds the fungal specific sterol ergosterol and destroys membrane integrity.

**Antibiotic**: A molecule that can kill or inhibit the growth of selected microorganisms.

**Bacitracin**: A topical antibiotic that affects cell wall synthesis.

**Bactericidal**: An agent that kills bacterial cells.

**Bacteriostatic**: An agent that inhibits the growth of bacterial cells.

**Cycloserine**: A polypeptide antibiotic that inhibits peptidoglycan synthesis.

**Gramicidin**: A peptide antibiotic that disrupts membrane integrity.

**Griseofulvin**: An anti-fungal antibiotic that inhibits cell division.

**Kirby**-**bauer** **test**: Method for determining antibiotic susceptibility. Antibiotic-impregnated disks are placed on an agar plate whose surface has been confluently inoculated with a test organism. The antibiotic diffuses away from the disk and inhibits growth of susceptible bacteria. The width of the inhibitory zone is proportional to the susceptibility of the organism.

**Minimal** **inhibitory** **concentration**: The lowest concentration of a drug that will prevent the growth of an organism.

**Mueller**-**hinton** **agar**: A specialized, standardized, para-amino benzoic acid-free media used for the Kirby-Bauer test.

**Multidrug** **resistance** **efflux** **pomp**: A transmembrane protein pump that can export many different kinds of antibiotics with little regard for structure.

**Neuraminidase** **inhibitors**: Anti-influenza drugs that target neuraminidase on the viral envelope and decrease the number of virus particles released.

**Nosocomial**: Hospital-acquired.

**Penicillin**-**binding** **protein**: Bacterial proteins, involved in cell wall synthesis, that are targets of the penicillin antibiotic.

**Quinolones**: A group of antibiotic drugs that inhibit DNA synthesis by targeting bacterial topoisomerases such as DNA gyrase.

**Secondary** **product**: Biosynthetic products that are not essential nutrients but enhance nutrient uptake or inhibit competing species (e.g. antibiotics).

**Selective** **toxicity**: The ability of a drug, at a given dose, to harm the pathogen and not the host.

**Transglycosylase**: An enzyme that links N-acetyl glucosamine and N-acetyl muramic acid into chains during bacterial cell wall synthesis.

**Transpeptidase**: An enzyme that cross-links the side-chains from adjacent peptidoglycan strands during bacterial cell wall synthesis.

**Vancomycin**: A glycopeptide antibiotic that inhibits bacterial cell wall synthesis in a mechanism distinct from penicillin inhibition.

**Zone** **of** **inhibition**: A region of no bacterial growth on an agar plate due to the diffusion of a test antibiotic.