**Module 7**

**Chapter 12 – The Eyukaryotes**

**Fungi**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: the study of fungi
* Fungi important in food chain
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ dead matter
  + Recycle \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Used for \_\_\_\_\_\_\_\_\_\_\_, produce food, \_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Most are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ anaerobes
  + Few anaerobes known

**Characteristics of fungi**

* Multicellular fungi identified based on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Colony characteristics, reproductive spores
* Classified into 3 groups:

*Molds and fleshy fungi*

* \_\_\_\_\_\_\_\_\_\_\_: body of fungus
  + Consist of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of cells joined together called \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_ (singular)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: filamentous mass of fungi
* Hyphae grow by elongating at the \_\_\_\_\_\_\_
  + Each \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is capable of \_\_\_\_\_\_\_\_\_\_
  + Fragments that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ can form new hypha
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hypha: portion of thallus that obtains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 actively \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *Hypha*

* Most hyphae have \_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into cell-like units

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ *Hypha*

* Few have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Appear as long continuous cells with \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Reproductive Hyphae*

* Concerned with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Aka \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hyphae
  + Project \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the surface

*Yeasts*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, unicellular fungi
  + - Typically \_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_
* Yeasts divide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + - Daughter cell (\_\_\_\_\_\_\_) is \_\_\_\_\_\_\_\_\_\_\_\_\_ than parent cell
* Yeasts capable of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growth
* Can use \_\_\_\_\_\_\_\_\_\_\_\_\_\_ as final electron acceptor
  + Produce \_\_\_\_\_\_\_\_\_\_ and water
* Can use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as final electron acceptor
  + Forms \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_
  + Important in food industry

*Dimorphic fungi*

* Can grow as \_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_
* In pathogens, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is temp-dependent
  + \_\_\_\_\_\_°C – yeastlike
  + \_\_\_\_\_\_°C – moldlike

*Characteristics of Fungi*

* Fungi are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Compete with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for food
* Nutritional characteristics provide some advantages
  + Fungi can grow \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Resistant to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Can grow in low \_\_\_\_\_\_\_\_\_\_\_\_\_, low \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ environment
  + Capable of degrading \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; lignin in wood

*Life Cycle of Fungi*

* Reproduction accomplished by forming \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Spores \_\_\_\_\_\_ from parent
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into new mold
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fungi
  + Produce both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ spores
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fungi
  + Produce only \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ spores
* Spores can survive for extended periods in \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_ to the extreme like bacterial \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Filamentous fungi reproduce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by fragmenting \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Asexual spores formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hyphae
* Spores are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Conidiospores*

* Spore \_\_\_\_\_\_\_ enclosed in \_\_\_\_\_\_
* Conidia (pl) or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ produced in chain at end of \_\_\_\_\_\_\_\_\_

Arthrospores

* A type of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Septate hyphae fragment into a \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_ spore, an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Sporangiospores*

* Formed within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_ at end of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Can contain hundreds of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Sexual Reproduction*

* *Sexual* spores result from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Requires opposite \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Spores have characteristics of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: fusion of haploid cells produces one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: formed in a sac (\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: formed externally on a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_)

**Fungal Diseases**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: a fungal infection
* Generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (long-lasting) because fungi \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Classified into 5 groups according to
  + Degree of tissue involvement
  + Mode of entry into host
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mycoses*
  + Infections \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the body
  + Route of entry is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Begin in \_\_\_\_\_\_\_, spread to other tissues
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mycoses*
  + Fungal infections \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Infection occurs by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of spores \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Sporotrichosis is subcutaneous infection acquired by gardeners, farmers
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mycoses*, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mycoses
  + Infect epidermis, hair, and nails
    - Secrete \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ keratin in hair, skin
  + Transmitted by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mycoses*
  + Localized along \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ skin cells
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is invaded, often unaware of infection
* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pathogen*
  + Generally \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in normal habitat
  + Becomes pathogenic in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ host
    - Under treatments with antibiotics, suppressed immune system

**Chemotherapy**

* Difficult to target fungi – cells are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Structures, metabolism is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Sterols** in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ differ in fungi
  + **Ergosterol** vs **cholesterol**
* Fungal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are also a target
* In general, anti-fungal treatments require \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Fungi grow \_\_\_\_\_\_\_\_\_\_\_\_\_\_ than bacteria

*Ergosterol Synthesis Inhibitors*

* Causes excessive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of membranes
* Polyenes:
  + Amphotericin B most common, but \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to kidneys
* Azoles
  + Most widely used anti-fungal
  + Imidazoles used as \_\_\_\_\_\_\_\_\_\_\_\_\_ for athlete’s foot and yeast infections
  + Triazoles (fluconazole, itraconazole) have \_\_\_\_\_\_\_\_\_\_\_\_\_, very commonly used

*Cell Wall Synthesis Inhibitors*

* Primary target is \_\_\_\_\_\_\_\_\_\_\_\_\_\_, found in chitin cell wall
* Incomplete cell walls lead to \_\_\_\_\_\_\_\_\_
* Echinocandins useful for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ myoses

**LIchens**

* Mutualistic combination of an \_\_\_\_\_\_\_\_\_\_\_ (or a cyanobacterium) and \_\_\_\_\_\_\_\_\_\_\_\_
* Alga produces and secretes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; fungus provides \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Colonize habitats that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for either the alga or the fungus alone
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ growing
* Three morphologic categories
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ lichen: grow \_\_\_\_\_\_\_\_\_\_\_\_ or encrusting on surface
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ lichen :\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ lichen – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ projections

**Protozoa**

**Characteristics of protozoa**

* Unicellular \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Inhabit water and soil
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: feeding and growing stage
* Relatively few cause disease
  + But diseases are significant
* Involve complex \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Often with multiple \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Reproduce asexually and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: formation of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ called a \_\_\_\_\_\_\_\_\_\_
  + Occurs as part of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Parasites can survive \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Some capable of anaerobic growth
* All live in areas with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Malaria*

* *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*: causative agent of malaria
* *Anopheles* mosquito is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ host - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Human is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ host – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ reproduction

*Toxoplasmosis*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - causative agent of toxoplasmosis
* Felines are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Mammals are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Cysts are excreted in feces of cats
* Humans \_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_ cysts
* Especially harmful to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 can cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Helminths**

*Characteristics of helminthes*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ eukaryotic animals
* Parasitic helminths have characteristics that differ from free-living helminths
  + Lack \_\_\_\_\_\_\_\_\_\_\_\_\_ system
  + Reduced \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system
  + Reduced or absent \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Complex \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hermaphroditic)
  + Male and female reproductive systems in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Separate male and female
* \_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Two groups of helminths
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Platyhelminths
  + The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 flukes and tapeworms
* Nematodes
  + The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Two modes of transmission
  + Eating of \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Excreted in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Eating of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - From \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Lung Fluke: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are definitive hosts
* Lives in \_\_\_\_\_\_\_\_\_\_, excreted in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are intermediate hosts
* Humans infected by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from mollusks

*Trichinosis: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* Nematode grows inside \_\_\_\_\_\_\_\_\_\_\_ intestines
* Humans gets infected by eating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Rat Lungworm: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

* \_\_\_\_\_\_\_\_\_\_\_\_\_ are definitive hosts
  + Lives in \_\_\_\_\_\_\_\_\_\_, excreted in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are intermediate hosts
* Humans get infected by eating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Humans are “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” or “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_” hosts
  + Can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Chapter 13 – Viruses, Viroids, and Prions**

**General characteristics of viruses**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Especially \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Can’t be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from solution
* Obligate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ parasites
  + No \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ when isolated
* Multiply \_\_\_\_\_\_\_\_\_\_\_\_\_\_ living cells
* Cause synthesis of special structures
* Contain \_\_\_\_\_\_\_\_\_\_ type of nucleic acid (\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_)
* Protein coat (\_\_\_\_\_\_\_\_\_\_\_\_\_) surrounding the nucleic acid
  + Some are enclosed by an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Viruses have \_\_\_\_\_\_\_\_\_\_\_\_\_ enzymes of their own
  + Completely \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on host cell
* Antiviral treatments \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Drugs that target replication machinery also target host cell
* \_\_\_\_\_\_\_\_\_\_\_\_ range: the \_\_\_\_\_\_\_\_\_\_\_\_\_ of host cells that virus can \_\_\_\_\_\_\_\_\_\_\_\_\_
* Most viruses are limited to \_\_\_\_\_\_\_ cell type of \_\_\_\_\_\_\_\_\_ host species
* Host range determined by:
  + Virus’ requirements for \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Availability of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for multiplying
* Viral host range gives potential in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Use of bacteriophage to treat \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ infections
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ viruses infect only tumor cells

*Virions*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, fully \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ infectious viral particle
* Composed of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, surrounded by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Capsid protects virus, determines \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Nucleic acid can be either \_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_ genome, never \_\_\_\_\_\_\_\_\_
* Can be \_\_\_\_\_\_\_\_\_\_\_\_ stranded (ds) or \_\_\_\_\_\_\_\_\_\_\_ stranded (ss)
* Viruses classified by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Some viruses have capsid covered by an \_\_\_\_\_\_\_\_\_\_\_\_ made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, carbohydrates

*Helical Viruses*

* Resemble \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Can be \_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_

*Polyhedral viruses*

* Many \_\_\_\_\_\_\_\_\_
* Most are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: 20 triangular faces, 12 corners

*Enveloped viruses*

* Covered by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + From plasma membrane from \_\_\_\_\_\_\_\_\_\_
* Can be enveloped \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, enveloped \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ used for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Complex viruses*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ structures in addition to capsid
* Additional structures can include \_\_\_\_\_\_\_\_, tail pin, \_\_\_\_\_\_\_\_\_\_\_, baseplate

**Taxonomy of viruses**

* Classification of viruses is based on type of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, replication, \_\_\_\_\_\_\_\_\_\_\_\_\_
* Family names end in *–\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* Genus names end in *–\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* Viral species: group of viruses that share same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ names are used for species
  + Subspecies are designated by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Growing Viruses**

* Viruses cannot replicate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of host
* In laboratory, viruses must be cultures in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Growing animal viruses in the laboratory*

1. In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Include mice, rabbits, and guinea pigs
* Most studies of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ involve live animals
* Some viruses cannot be grown in animals, or do not cause disease
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, HIV has no live animal model
  + Difficult to study

1. In embryonated \_\_\_\_\_\_\_\_\_\_

* Convenient and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_ is drilled in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of embryonated egg
  + Viral suspension, virus containing tissue injected
  + Many membranes in egg can support growth of virus
* Many viral \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ prepared in eggs

1. In \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Preferred growth medium of viruses
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_ population of cells, handle much like \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to work with than live animals, eggs
* Cell cultures (not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) grown in liquid culture media in lab
  + Viruses grow in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Viral multiplication**

*Multiplication of animal viruses*

* All animal viruses have similar life cycles
* Major difference between viruses is in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Attachment*

* Attach to \_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) on host \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ distributed all over viruses
  + - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Entry*

* Nonenveloped viruses enter by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Transport of molecules into a cell via vesicles
* Enveloped viruses enter through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to host membrane

*Uncoating*

* Separation of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Many ways this happens

*Biosynthesis and Maturation*

* Biosynthesis
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of viral DNA 🡪 viral \_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of viral mRNA 🡪 viral \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Uses mostly \_\_\_\_\_\_\_\_\_\_\_ enzymes
* Maturation
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Release*

* Nonenveloped viruses released by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plasma membrane
* Enveloped viruses obtain envelope by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Assembled \_\_\_\_\_\_\_\_ pushed though \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Live Cycle of Enveloped Virus 🡪 HIV*

* \_\_\_\_\_\_\_\_ genome
* Must convert \_\_\_\_\_\_\_\_\_\_ into \_\_\_\_\_\_\_
* Uses \_\_\_\_\_\_\_\_\_\_\_\_\_ enzyme
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* HIV infects \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells (\_\_\_\_\_\_ cells)
  + A white blood cell
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ binds to protein on T cell
  + Protein receptor \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Helper T cells
* HIV enters cell
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fuses with membrane
* Uncoating
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ converts viral RNA into DNA
* Retroviral DNA enters \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Inserts into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Integrated viral DNA is known as \_\_\_\_\_\_\_\_\_\_\_\_\_
* Can exist in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ state
* Productive state – HIV matures
  + Maturation
  + Released by \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Viruses and cancer**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: genes associated with cancer
* Many oncogenes control when a cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Activated oncogenes transform normal cells into \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells grow uncontrolled, leading to \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The genetic material of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ viruses becomes integrated into the host cell’s \_\_\_\_\_\_\_\_\_\_ 🡪 forms \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Insertion can activate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Latent viral infections*

* Viruses remains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ host cell for long periods

*Persistent viral infections*

* Disease process occurs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over a long \_\_\_\_\_\_\_\_\_\_\_; generally \_\_\_\_\_\_\_\_\_