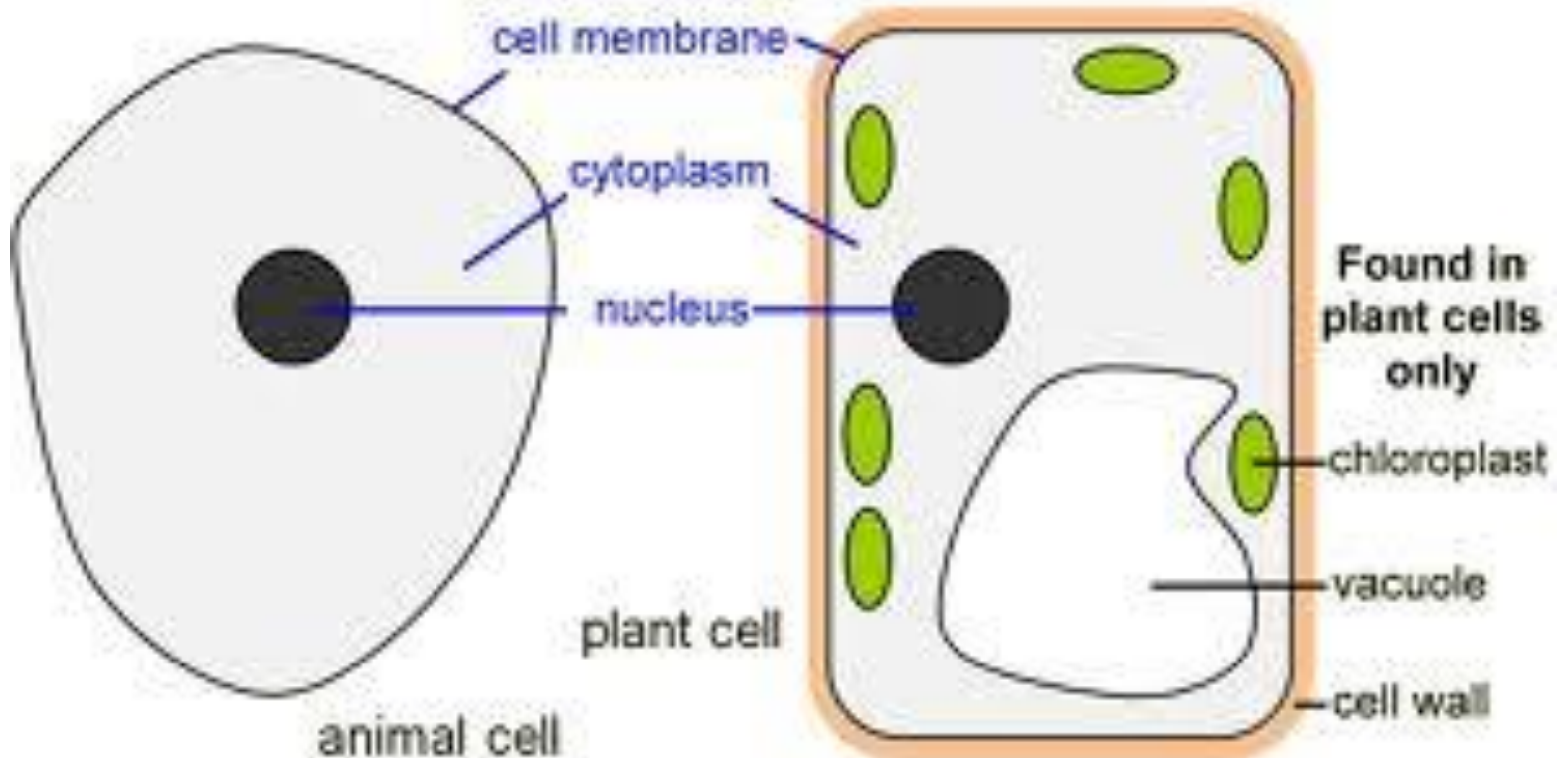


CELLO EDD

CELLS



CELL BILEN - rheoli'r trylediad sylweddau i fewn ac allan (lled-athraidd) !

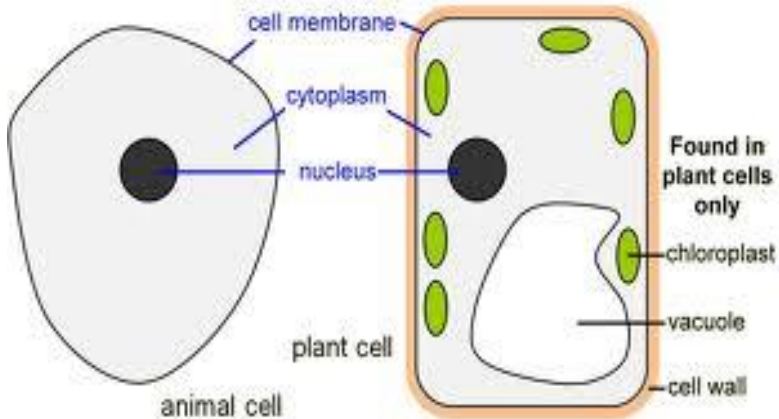
CELL MEMBRANE - controls the diffusion of substances in /out (semi-permeable)!

CNEWYLLYN - rheoli'r gell

NUCLEUS - controls the cell

CYTOPLASM - adweithiau cemegol !

CYTOPLASM - chemical reactions !



CLOROPLAST - llawn cloroffyl (pigment gwyrdd) sy'n amsugno egni golau yn ystod ffotosynthesis !

CHLOROPLAST - full of chlorophyll (green pigment) which absorbs light energy for photosynthesis!

GWAGOLYN - llawn cell nodd !

VACUOLE - full of cell sap !

CELL WALL (cellulose) - supports plant cells (permeable) !

CELL WALL (cellulose) - supports plant cells (permeable) !

**MICROSCOP DELWEDD
GOLAU**

defnyddio golau x1000

LIGHT MICROSCOPE

uses light x1000



MICROSCOP ELECTRON

☺ **X50 miliwn + gweld strwythr**

mewnol celloedd

☹ **Ni ellir arsylwi samplau byw**

ELECTRON MICROSCOPE

☺ **x50 million + internal structure of
cells visible**

☹ **Not possible to sample living cells!**



Pluripotent Stem Cells

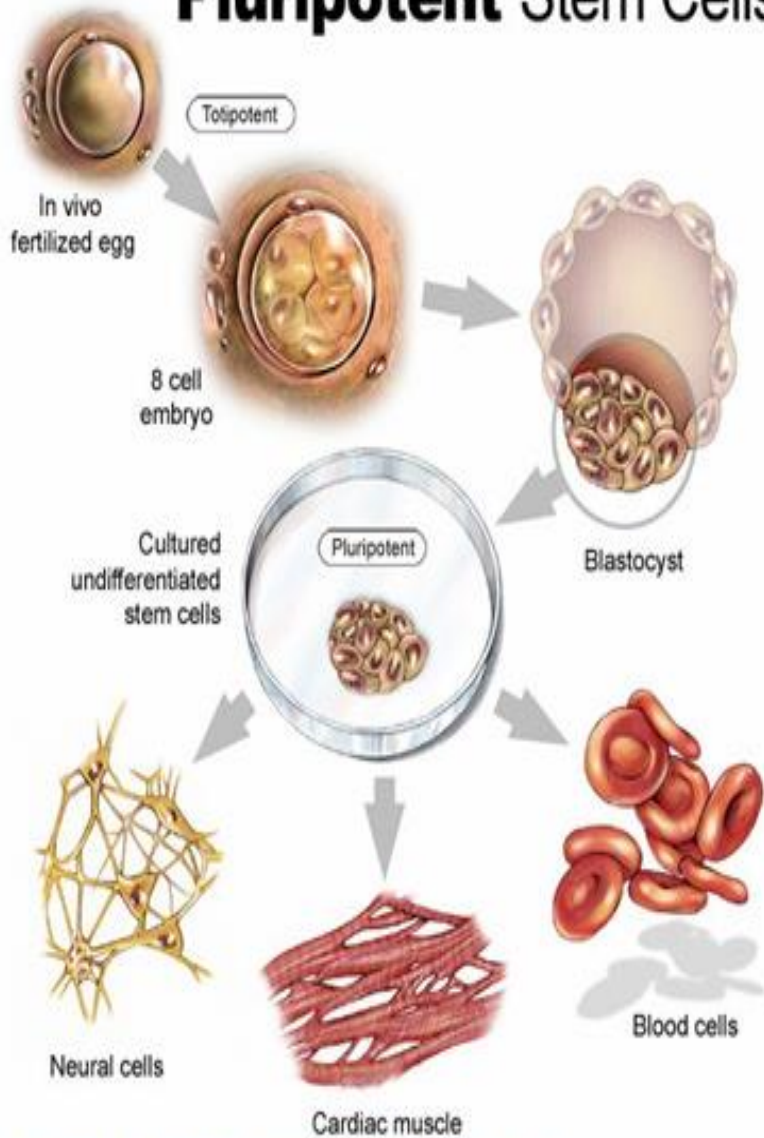


Figure 2: Process of Embryonic Stem Cells

CELLOEDD BONYN STEM CELLS

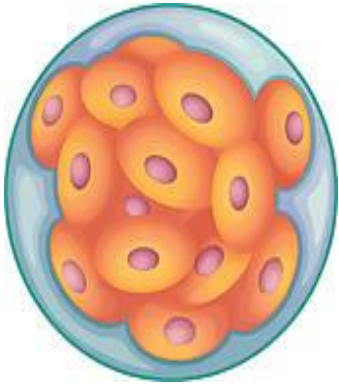
Celloedd heb

wahaniaethu a
potensial i ddatblygu
i fathau gwahanol o
gelloedd.

Undifferentiated cells
with the potential to
develop into different

types of cells

CELLOEDD BONYN



EMBRYONIG

☺ Trin rhai afiechydon a meinwe wedi niweidio e.e. nerf.

☹ Celloedd dieithr yn cael eu gwrthod!

EMBRYONIC STEM CELLS

☺ Treat some diseases and damaged tissue issue e.g. nerves.

☹ Cells may be rejected!

☹ Immoral (embryos destroyed).

ryonau).



CELLOEDD BONYN e.e. Mêr Asgwrn STEM CELLS e.g. bone marrow

☺ Llai o siawns cael eu gwrthod!

☺ Less likely to be rejected!

PLANHIGION - tyfiant canghennog /lledaenu !

(gallu i gyrraedd goleuni a chludo dwr)



PLANTS growth !

to reach light and transport water)

ANIFEILIAID - tyfu i faint penodol !

(gallu i symud a chludo O₂ i'r cell)



ANIMALS - grow to a finite size!

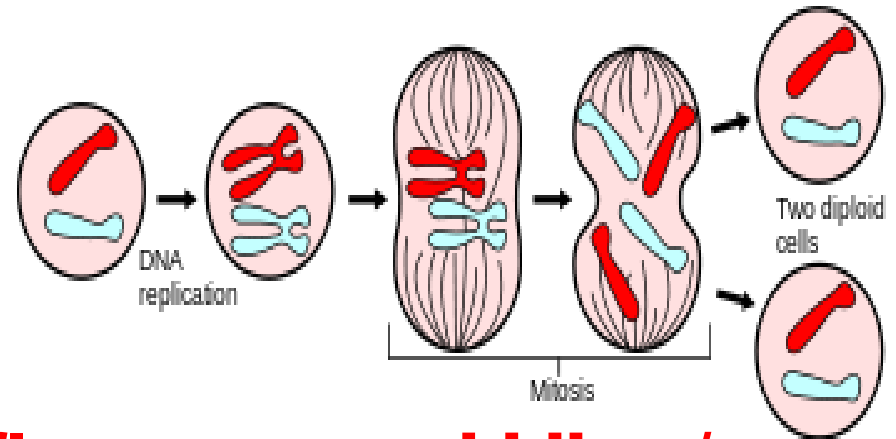
(ability to move and transport O₂ to cells)

TYFIANT ?

Cell raniad =
MITOSIS

GROWTH ?

Cell division =
MITOSIS



MERISTEM - ardal ar flaenau gwreiddiau /

coesynnau lle mae mitosis yn digwydd !

CAMBIWM - ardal o feristem = tyfiant ychwanegol i goesyn !

MERISTEM - areas at the tips of roots

/stem

where mitosis occurs !



CAMBIUM - area of meristem = additional growth to

CELL

RANIAD

Tyfiant

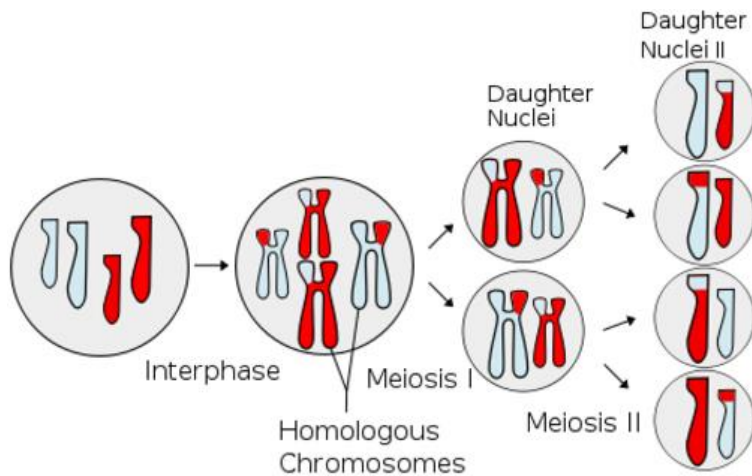
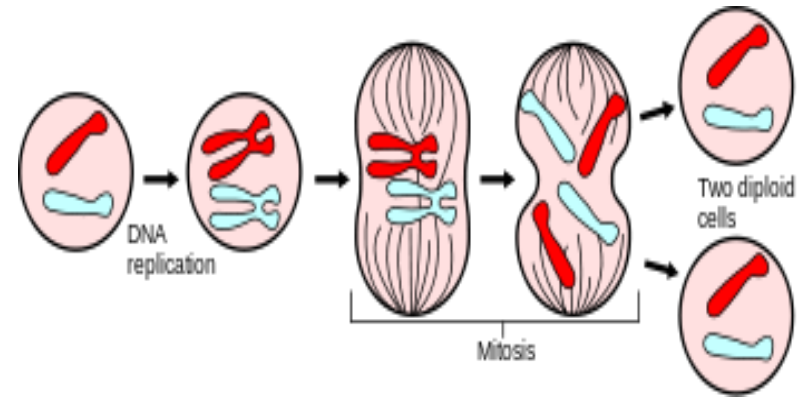
Atgywirio Celloedd

Adnewyddu

Celloedd

Cynhyrchu

Gametau



CELL DIVISION

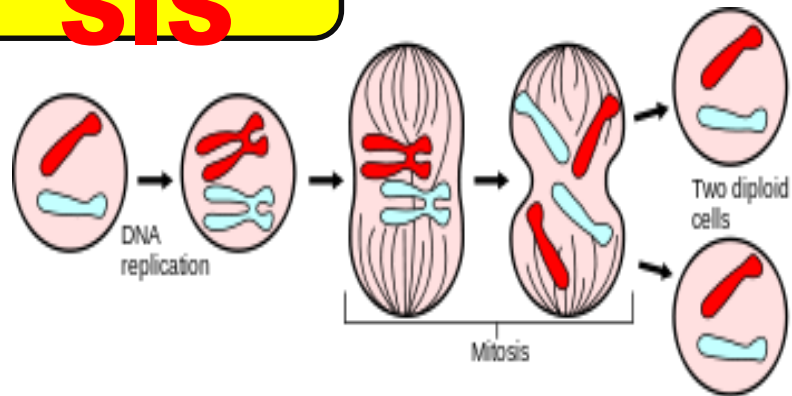
Growth

Repair Cells

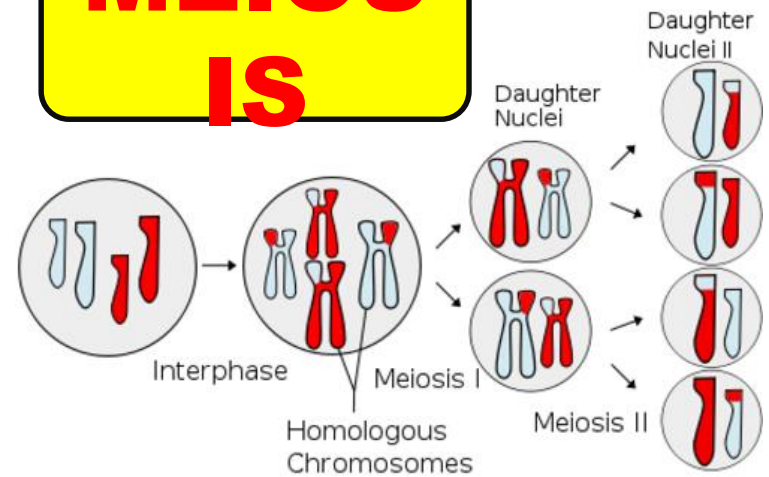
Replace Cells

Produce Gametes

MITOSIS



MEIOSIS



Tyfiant (Growth)

Atgyweirio (Repair)

Adnewyddu (Replace)

2 gell newydd (2 new cells)

Cromosomau – Run fath (Chromosomes – Same)

Dim Amrywiaeth (No Variation)

Cynhyrchu Gametau (Produce Gametes)

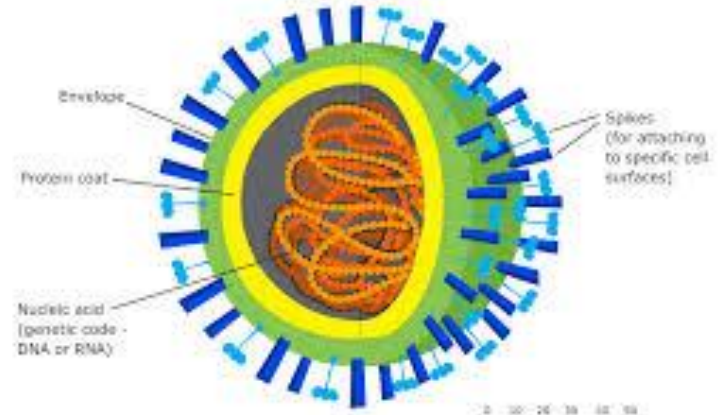
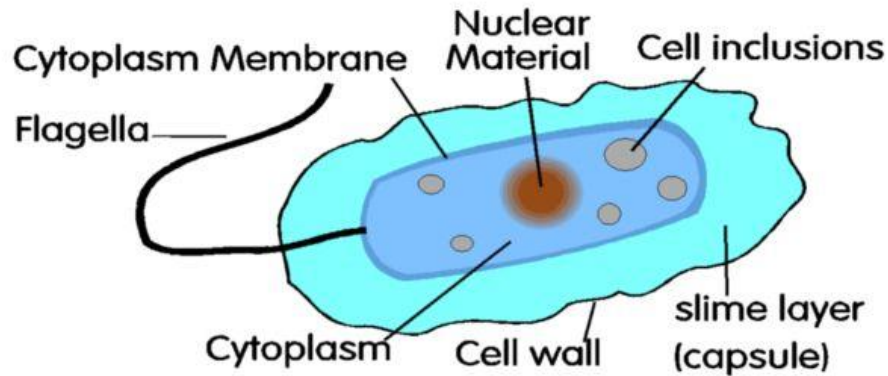
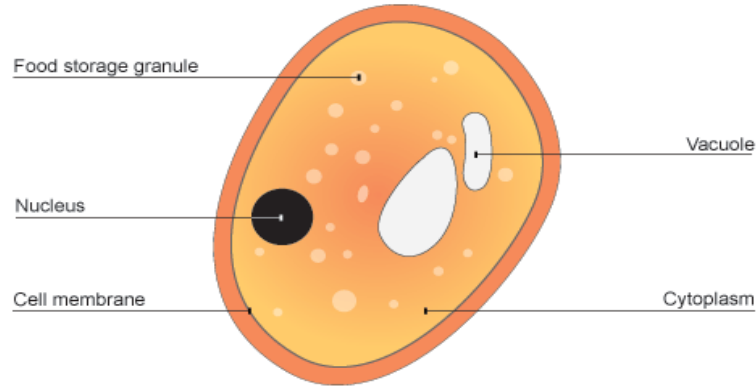
4 gell newydd (4 new cells)

Cromosomau – Hanneru (Chromosomes – Half)

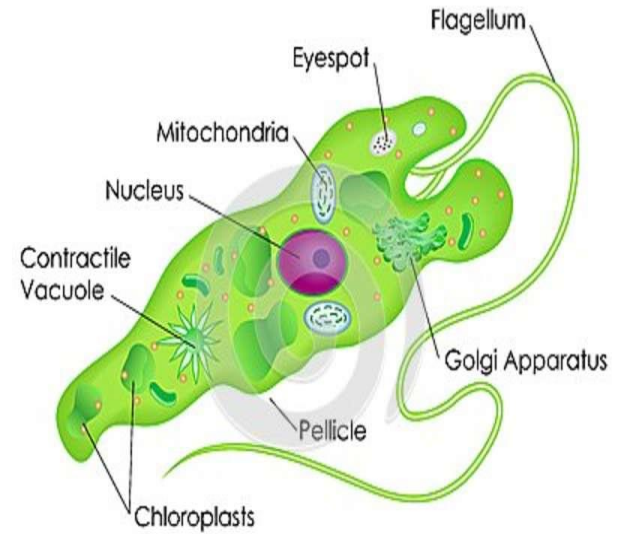
Amrywiaeth (Variation)

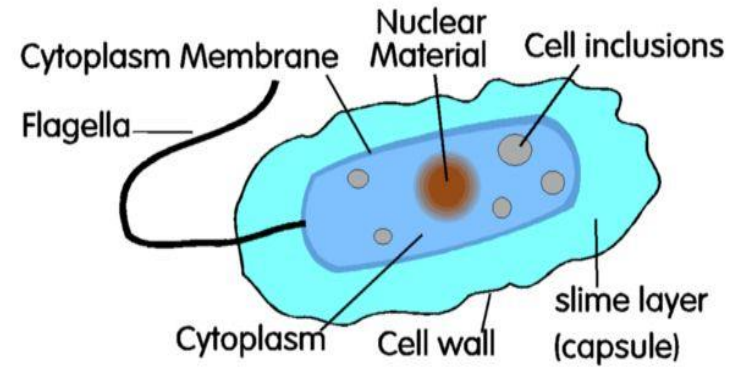
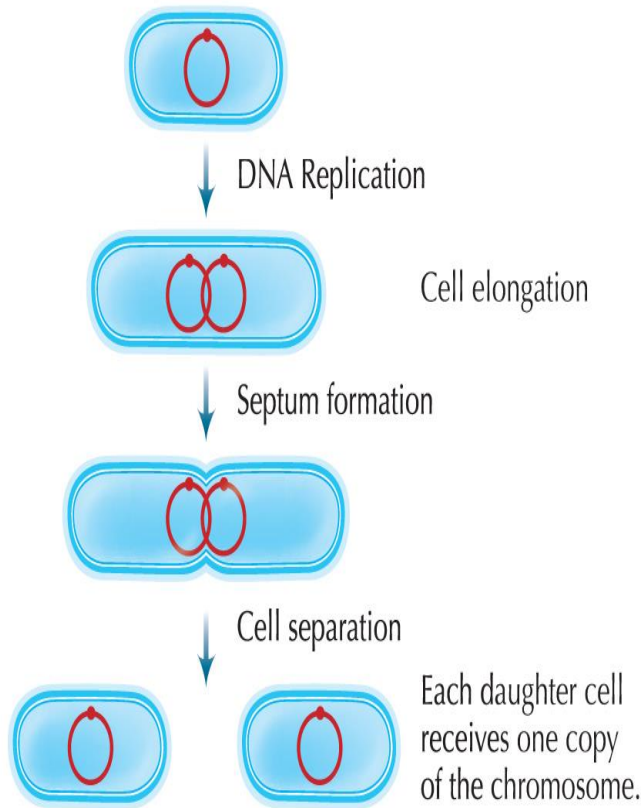
MICROBAU

MICROBES



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BACTERIA ~ 1µm

Dim Cnewyllyn

Cell Fur

**Atgenhedl drwy rannu yn
ddau !**

BACTERIA ~ 1µm

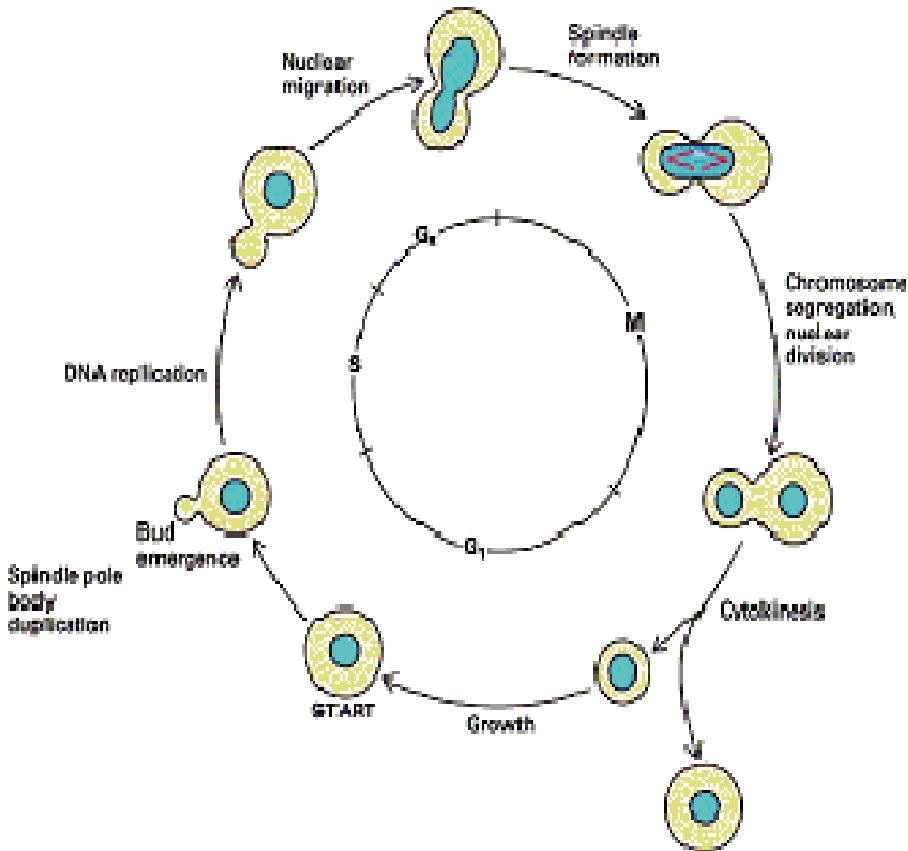
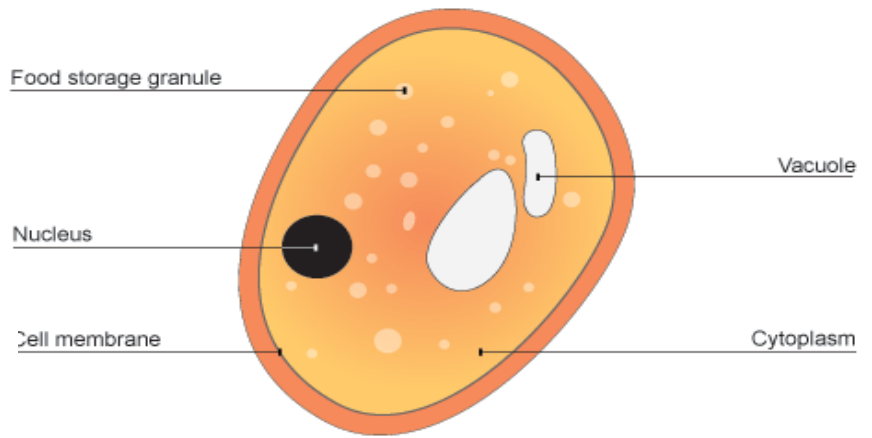
No Nucleus

Cell Wall

Reproduce by dividing in

two !

FIGURE 6.5. Binary fission in bacteria.



FFWNGI (burum) ~

3µm

Cnewyllyn / Cell Fur

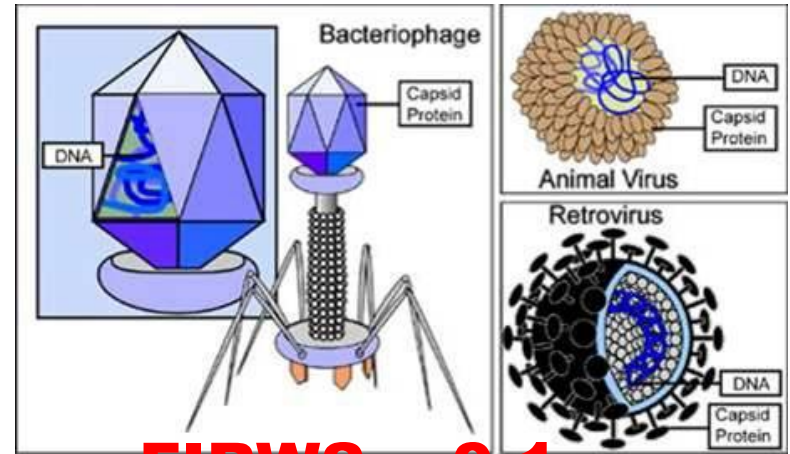
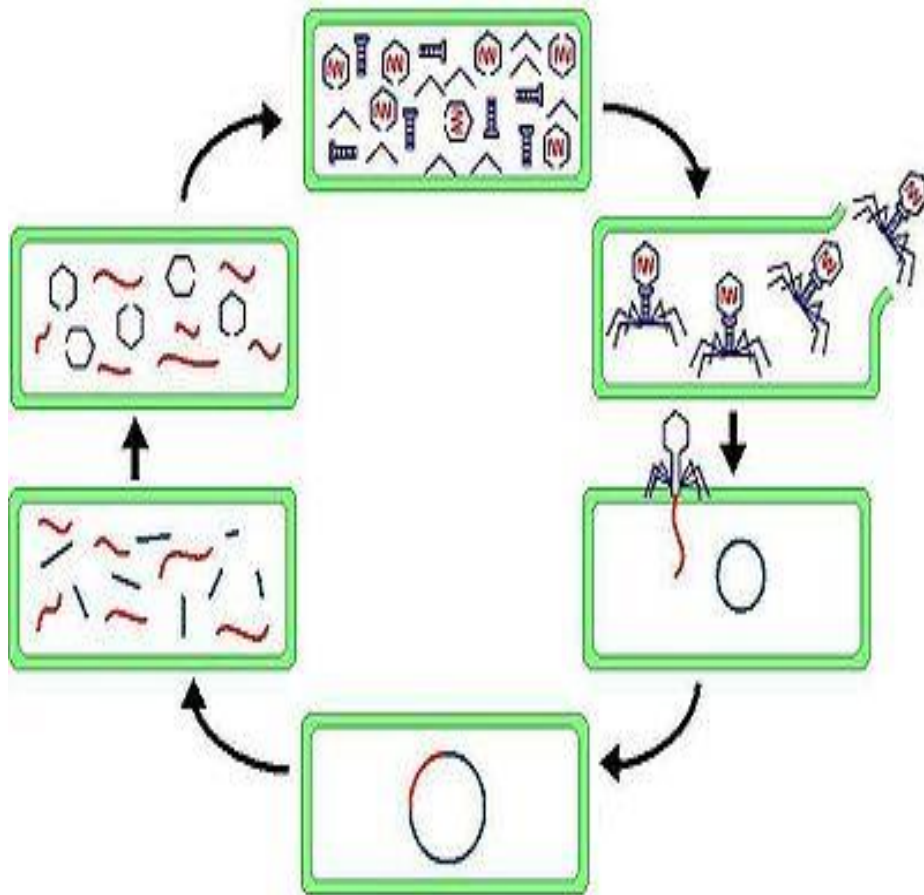
Atgenhedlu drwy

FLAGURO !

FUNGI (yeast) ~ 3µm

Nucleus / Cell Fur

Reproduce by BUDDING !



FIRWS ~ 0.1µm

**Dim Cnewyllyn / Cell Bilen /
Cell Fur**

**Atgenhedlu tu fewn i
gelloedd eraill (lletyol) !**

VIRUS ~ 0.1µm

**No Nucleus / Cell Membrane
/ Cell Wall**

Reproduce inside other

cells (host) !

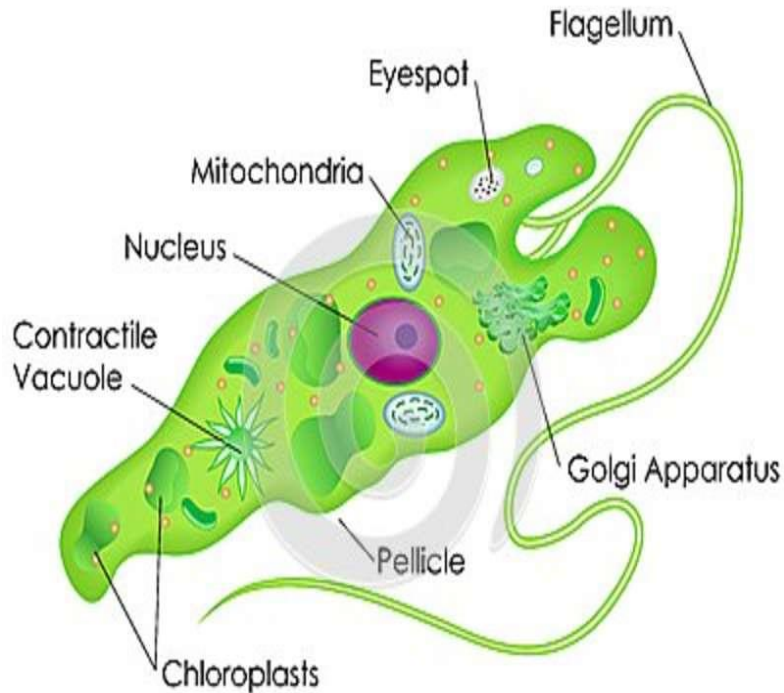
ALGAU (Euglena) ~

10µm

**Cnewyllyn / Cell Bilen
Smotyn Llygad i ganfod
golau**

Fflagelwm i symud

**Cloroplastau =
Ffotosynthesis**



ALGAE (Euglena) ~

10µm

No Nucleus / Cell Membrane

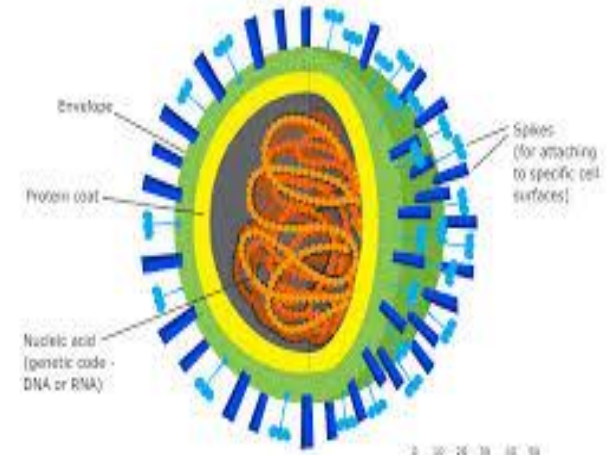
Eye Spot (to find light)

Flagellum for movement

Chloroplasts =

DAMCANIAETH CELLOEDD – Ydi Firysau yn fyw ?

CELL THEORY – Are Viruses alive ?



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YDYN !

- Maent yn gallu atgenhedlu !
- Maent yn cynnwys genynnau

YES !

- They can reproduce !
- They have genes !

NA ! NO !

- Gorfod defnyddio celloedd eraill i atgenhedlu a goroesi

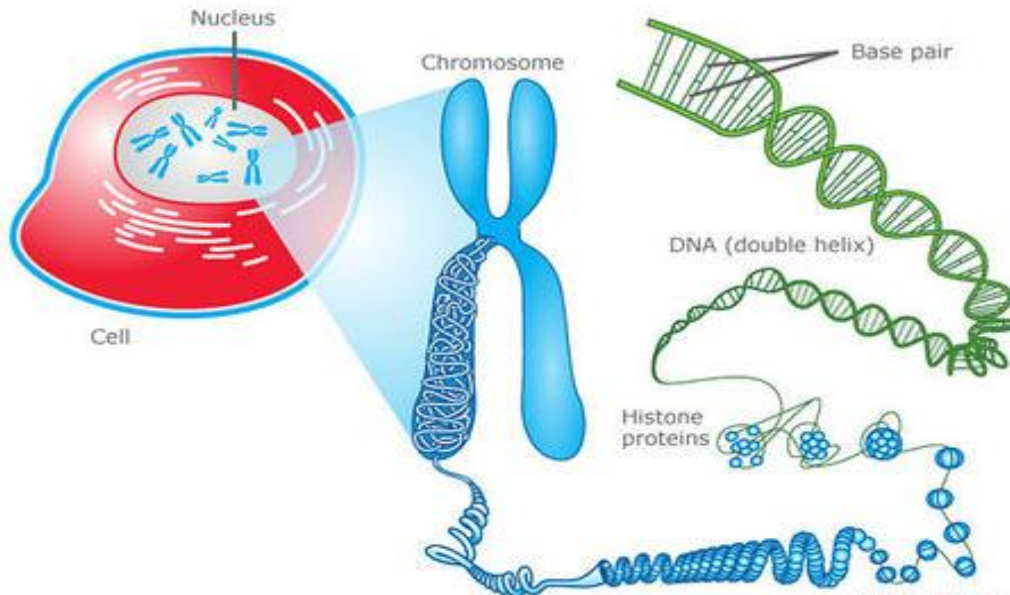
!

- They have to use other cells to reproduce and survive !

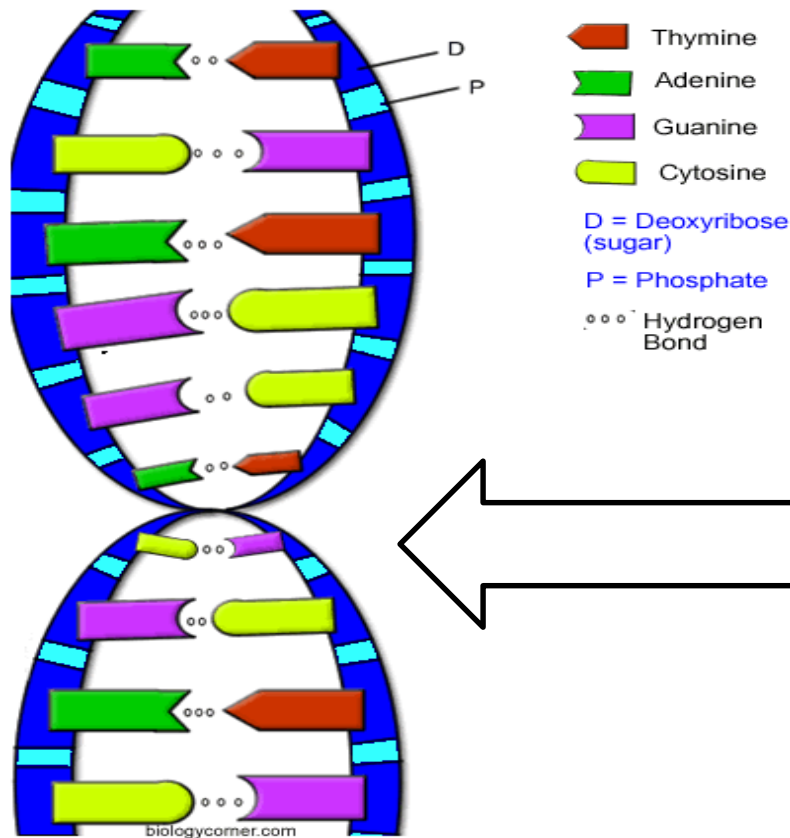


Watson & Crick (1953)

Darganfod strwythr DNA !
Discovered the structure of
DNA !



HELICS
DWBL
DOUBLE
HELIX



**2 gadwyn o foleciwlau siwgr /
ffosffad**

**Pâr o fasau yn dal y 2
gadwyn**

(A/T a C/G)

Dirdroi i ffurfio helics dwbl

DNA

**2 chains of sugar/phosphate
molecules**

**Pairs of bases attach both
chains**

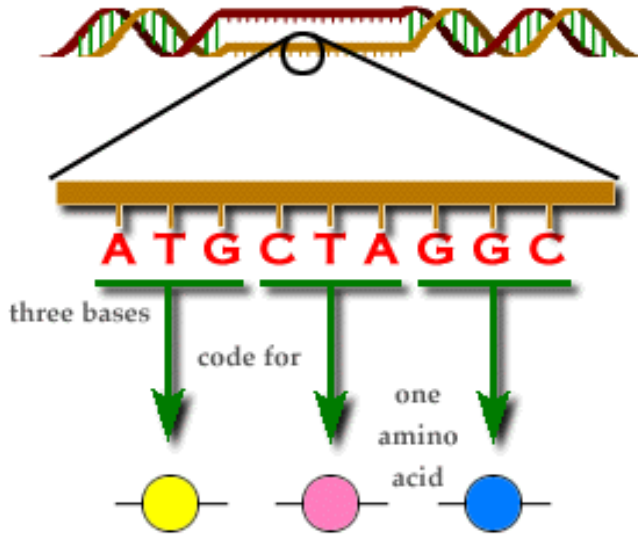
(A/T and C/G)

**Twisted to form a double
helix**

**Pâr Basau Base
Pairs**

**Adenine = Guanine
Cytosine =
Thymine**

The Genetic Code



CÔD TRIPLD

Trefn 3 bas yn codio am Asid Amino !

**TRIPLET CODE
3 bases code for an AMINO ACID !**

Mae gwahanol asidau amino mewn cadwyn yn ffurfio protinau gwahanol !

Different amino acids in a chain form different proteins !

		Second Letter				
		T	C	A	G	
First Letter	T	TTT } Phe TTC } TTA } Leu TTG }	TCT } Ser TCC } TCA } TCG }	TAT } Tyr TAC } TAA } Stop TAG } Stop	TGT } Cys TGC } TGA } Stop TGG } Trp	T C A G
	C	CTT } Leu CTC } CTA } CTG }	CCT } Pro CCC } CCA } CCG }	CAT } His CAC } CAA } Gln CAG }	CGT } Arg CGC } CGA } CGG }	T C A G
	A	ATT } Ile ATC } ATA } ATG } Met	ACT } Thr ACC } ACA } ACG }	AAT } Asn AAC } AAA } Lys AAG }	AGT } Ser AGC } AGA } Arg AGG }	T C A G
	G	GTT } Val GTC } GTA } GTG }	GCT } Ala GCC } GCA } GCG }	GAT } Asp GAC } GAA } Glu GAG }	GGT } Gly GGC } GGA } GGG }	T C A G