

## CELLS

### **MICROTUBULE TRACKWAYS**

How do materials move about in living cells? Amazingly there is a "rapid transit system" composed of microtubule (the tracks) and carrier molecules (the trucks) that tote supplies (often contained in vesicles) from manufacturing sites, out to where they are needed. Microtubules also pull and push cell structures such as chromosomes and act as structural elements in cells.

### **MITOCHONDRION CUTAWAY**

Mitochondria are the powerhouses of the cell. They take in fuel molecules derived from sugars and fats, harvest the energy in their chemical bonds with the aid of oxygen, and spit out ATP, the universal energy carrier needed throughout the cell to fuel the energy-hungry reactions of life. This cutaway graphic shows the mitochondrion's two membrane layers: a smooth outer membrane and a folded inner membrane where enzymes (depicted as balls) help with the synthesis of ATP.

### **CHLOROPHYLL ABSORPTION SPECTRUM**

Why are plants green? This graphic presents a simple answer: light-absorbing chlorophyll molecules are present in thylacoid discs that fill the chloroplast. Out of the entire spectrum of colors that makes up white light, chlorophyll absorbs both the red and blue. Green is reflected away, and is the color you observe.

### **THE PROTEIN ASSEMBLY LINE**

This graphic, from an animated sequence, portrays the roles of the various RNA molecules: messenger RNA, ribosomal RNA, and transfer RNA in assembling the amino acids that will make up a polypeptide chain. The key event here is the matching (base pairing) of M-RNA to T-RNAs, each carrying its specific amino acid.

### **DISASSEMBLY OF DNA WITHIN A DIGESTIVE ENZYME**

Where do DNA building blocks (nucleotides) come from? From your food, of course. Food for all animals is--other organisms. Digestion is a matter of breaking down the food organism's macromolecules into their building blocks. In this case a long strand of DNA is enzymatically cleaved into four kinds of nucleotides which can be reassembled to make the new DNA molecules required for cell division.

## A COMMON MUTATION

Thymine, one of the four DNA building blocks, has a powerful chemical attraction to others of its own kind. Sometimes, as DNA is replicated, two adjacent thymine bases will bond as in the illustration, forming a "thymine dimer", and creating a glitch in the linear genetic information code. Thymine dimers are also formed by the interaction of ultraviolet light with DNA molecules – a good reason to limit exposure to bright sunlight. Fortunately, cells contain "proof reading enzymes" that scour the DNA, looking for thymine dimers to excise and replace, generally keeping the code accurate and up to date.

## BACTERIA

- A- Lactobaccilus ? – These chains of bacteria make yogurt out of milk
- B- Sarcina – a non-motile aerobic bacterium
- C- Oscillatoria – a common filamentous cyanobacteria growing as large filaments
- D- Long rod bacteria with spores forming at one end
- E- Anabaena – a cyanobacterium. When present in domestic water supplies, this species imparts a swampy taste
- F- Red bacteria living attached to a strand of filamentous algae
- G- In pond water culture – long bacteria rods aggregating along the edge of a thick mat of similar rods
- H- A dense culture of rod-like bacteria concentrated in a culture of pond water
- I- Spirulina, cyanobacteria – This species is cultured for a food supplement. (video shows movement)

Photos	1	2	3
<b>Top</b>	.....	.....	.....
<b>Middle</b>	.....	.....	.....
<b>Bottom</b>	.....	.....	.....

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**SUPPOSITION :**

To assume

To guess

To presume

To suppose

It can/may/could/might be

By guesswork

Perhaps

Maybe

Presumably

**POSSIBILITÉ :**

Could

Might

It is possible that

There is reason to believe that

I venture to suggest that

**PROBABILITÉ :**

To appear that (it would appear that)

To be probable

To be likely (it is likely that)

There is a good chance that

It stands to reason that

It is reasonable to think that

The odds are that

**CONVICTION, CERTITUDE :**

To think

To believe

To be certain

To be sure

To be convinced

To have no doubt about

No one can deny that

It must be

Definitely

Certainly

To be positive about

Undoubtedly

## Notes for teachers

Recherche vocabulaire essentiel

Identification du texte : UK or US (voir « color ») ?

Faire correspondre images et texte **en justifiant** le choix (Cells : justification orale, Bacteria : justification écrite. Possibilité de faire Bacteria d'abord)

Utilisation des notions/fonctions 'Probabilité', 'Certitude', 'supposition', etc. (must, may, could, I think, I suppose, I believe, I am sure that, etc.)

Réponses

1- A common mutation

2- Microtubule

3- The protein assembly line

4- Mitochondrion

5- Chlorophyll

6- Dissassembly of DNA

Photos	1	2	3
<b>Top</b>	.....D.....	.....G.....	.....A.....
<b>Middle</b>	.....C.....	.....B.....	.....F.....
<b>Bottom</b>	.....E.....	.....H.....	.....I.....