

## THE GRADIENT

### Cell Membrane & Cellular Transport

By Dr. Henry (sung to the tune *The Brady Bunch*)

Cell membranes are *bilayer phospholipids*  
that keep molecules out and others in.  
The lining of the layer's hydrophilic,  
while the hydrophobic part is found within.  
This lipid bilayer's full of proteins.  
They run all the way or part way through  
the membrane, allowing cellular diffusion.  
This *Fluid Mosaic Model's* tried and true.

Chorus: The gradient. The gradient.  
Along the concentration gradient.

It's a breeze for a cell to conduct diffusion,  
A selectively permeable membrane's like a gate.  
But the protein gate will close to a solution,  
if it's something that the protein's made to hate.  
Protein gates are passively selective,  
allowing certain things to travel through.  
Though no energy's required, it's still protective.  
That's *Facilitated Transport* just for you.

Chorus: The gradient. The gradient.  
Along the concentration gradient.

No energy required, *Diffusion Transport*  
has different concentrations on its shunt,  
from a higher to a lower concentration,  
move along the concentration gradient.  
*Osmosis* is of solute and of solvent.  
Water likes to move from up to down,  
Across the membrane's concentration gradient,  
'til a solvent-solute balance can be found.

Chorus:

*Active Transport* is the one exception,  
requiring energy to run a pump,  
so things can flow the opposite direction,  
against the concentration gradient.  
Moving to a higher concentration,  
*Active Transport* needs some energy.  
To pump a substance to its destination  
Requires a molecule called *ATP*.

Chorus: The gradient. The gradient.  
Along the concentration gradient

And cells can eat, and they excrete,  
Requiring energy like you and me.  
*Endocytosis* is just like eating,  
Pinocytosis is just to have a drink  
But when it comes to *Exocytosis*  
Think ceramic that is not the bathroom sink.

Chorus: The gradient. The gradient.  
Along the concentration gradient