**Extension Work - Questions on Water Channels in the Cell Membrane Article**

1. What is one of the major functions of the plasma membrane surrounding the cell? (ref. p1 parag 2)

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1. How can lipid soluble molecules such as fatty acids and cholesterol be taken up by a cell? (ref. p1 parag 2

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1. How do oxygen and carbon dioxide enter or leave a cell? Explain. (ref. p 1 parag 2)

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1. How do polar molecules and electrolytes pass through a membrane? (ref. p1 parag 2)

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1. Why can water pass through the membrane by diffusion if it is a polar molecule?(ref p1 parag 3)

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1. However, diffusion of water directly through the phospholipid membrane is limited, ‘all cell membranes have a small but finite water permeability’. How many times higher than this basal water permeability is the water permeability of cells such as red blood cells, endothelial cells of blood capillaries and epithelial cells of kidney tubules? (ref. p1 parag 3)

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1. When was the first water channel protein isolated? (ref. p1 parag 4)

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1. What technique of molecular biology did scientists use to make millions of copies of the DNA sequence that coded for the water transport protein? (ref. end p1, start p2)

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1. What did they name the water transport protein? Give acronym and full name. (ref. p 2 parag 1)

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1. Which parts of this form spiral structures within the bilayer and associate with the hydrophobic fatty acid tails of the phospholipids? (ref p2 parag 2)

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1. Which parts of this molecule create a pore through the membrane? (ref. p2 column 2)

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1. This molecule was found to be similar to some other major intrinsic proteins (MIPs), many of which also have been found to function as water channels. What name is given to these types of membrane proteins? (Ref p3 column 1)

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**NOTE**: This article is from 1996, and much research has gone on since then in this field. For example many more than the 5 aquaporins mentioned in the article have now been found!