Permeability of Red Blood Cells - Lab 2

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BIO1140 Section

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Table 1.0: Mean and standard error for sheeps red blood hemolysis under the conditions of five different solutions.

	Hemolysis (seconds)	
Solution	**Mean**[a]	**Standard Error**
Distilled Water	<2[b]	0
Triton X-100	<2[b]	0
Ethanol	<2[b]	0
Thiourea	64.67	3.28
Dextrose	>1200[c]	0

[a] The average of three trials in seconds (s).

[b] These were instantaneous, but were recorded as <2 seconds.

[c] This time was not complete, as it took longer than 1200 seconds.

Questions

1. **What are the factors that affect the diffusion of the solutes tested in the permeability experiment? How do these factors affect the diffusion of solutes?**

One factor that affects the diffusion of the solutes is the cell size. The larger the cell, the slower diffusion progresses. This is inverse proportionality. For example, water molecules are much smaller than dextrose molecules and therefore will diffuse through the plasma membrane much faster. Another factor that influences diffusion is a substance's polarity/solubility. Non polar substances/molecules are able to diffuse much more easily and faster than polar molecules through the plasma membrane due to the plasma membrane's structure (phospholipids). All the molecules listed in Table 1.0 are polar, and thus no good example can be given. However, the rate of diffusion varies from those substances because of cell size (look above for this point). For example, dextrose's molecular mass is 180 g/mol whereas water's is 18 g/mol. Since dextrose is considerably larger (nearly by ten times), it will diffuse slower even though both are polar.