**Chalk Talk**: Fluid Mosaic Model with Chalk Markers

AP Biology



**Introduction**

Each cell of your body is encased in a tiny bubble of the membrane. This membrane has about the consistency of...salad oil. The first time I read that factoid, I didn't find it very reassuring! Salad oil seems like an awfully fragile boundary to place between a cell and the rest of the world. Luckily, the plasma membrane turns out to be very well-suited to its job, salad oil texture and all.

What exactly is its job? The plasma membrane not only defines the borders of the cell but also allows the cell to interact with its environment in a controlled way. Cells must be able to exclude, take in, and excrete various substances, all in specific amounts. In addition, they must be able to communicate with other cells, identifying themselves and sharing information.

To perform these roles, the plasma membrane needs lipids, which make a semi-permeable barrier between the cell and its environment. It also needs proteins, which are involved in cross-membrane transport and cell communication, and carbohydrates (sugars and sugar chains), which decorate both the proteins and lipids and help cells recognize each other.

**Fluid mosaic model**

The currently accepted model for the structure of the plasma membrane, called the fluid mosaic model, was first proposed in 1972. This model has evolved over time, but it still provides a good basic description of the structure and behavior of membranes in many cells.

According to the fluid mosaic model, the plasma membrane is a mosaic of components—primarily, phospholipids, cholesterol, and proteins—that move freely and fluidly in the plane of the membrane. In other words, a diagram of the membrane is just a snapshot of a dynamic process in which phospholipids and proteins are continually sliding past one another.

Interestingly enough, this fluidity means that if you insert a very fine needle into a cell, the membrane will simply part to flow around the needle; once the needle is removed, the membrane will flow back together seamlessly.

**Driving Question**: **How does life survive in a world surrounded by water?**

**Task**: Using Chalk Markers and Playdough construct a model of the cell membrane. Make sure to label and describe the following structures and functions in your model.

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| * Phospholipid (Glycerol, fatty acid tails, phosphate head) * Membrane Proteins (Integral & Peripheral) * Cell Markers (Glycoproteins & Glycolipids) * Temperature (How does it play role?) * Role of Membrane Proteins * Saturated vs unsaturated fats * Selective Permeability | * Lipid Bilayer * Cholesterol * Aquaporins * Hydrophobic * Hydrophilic * Amphipathic |

**Deliverable**: Take a **picture** of the model and **submit** it via Google Drive.