What’s in a Cell?

 Under the microscope the cell of an animal will often appear as an egg. This cell contains many structures with a variety of functions. The “yolk” of the cell we see in the middle is the **nucleus** and the protective layer we see around the outside is the cell membrane. The **cell membrane** protects the cell and is selectively permeable, meaning it only lets certain things into the cell. The empty space we see isn’t empty at all! It is filled with a goopy substance called the **cytoplasm**. The cytoplasm separates organelles and is where many important biochemical reactions occur. The cell can’t be all shapeless goop though or it would be squished. Like our bodies the cell needs a “skeleton”. This skeleton is a little different than ours. The **cytoskeleton** which translates literally to skeleton of the cell is made of small pieces that give basic structure to the cell. The **nucleus** plays a very important role, storing and protecting **DNA** within the cell. The DNA contains all of the instructions for how to make the body function! DNA is translated by **ribosomes** in the **rough endoplasmic reticulum** into proteins. The ribosomes “read” the DNA and put ingredients (amino acids) together. The Rough ER helps to fold those amino acids into a useful shape which is a protein. Some DNA, specifically from the egg cell, is stored in another structure called the **mitochondria**. The **mitochondria** is often referred to as the “powerhouse of the cell” because it is responsible for generating energy in the cell.

This protein is transported by **vesicles** to the **Golgi Apparatus** where more molecules are added to the protein before it leaves the cell and functions in the body. There is another path for making molecules for use in the body. The **Smooth Endoplasmic Reticulum** creates lipid based fatty molecules and plays an important role in breaking down toxins in the body**.** A structure called a **lysosome** contains digestive enzymes which can help break down molecules when they enter the cell. When the cell is ready to die, which happens to all cells eventually, it utilizes the **lysosome.** The lysosome releases digestive enzymes into the cell which **lyses** it (ruptures the cell membrane) causing it to die. Cell death is called **apoptosis**.