BASIC MICROSOPY CONCEPTS

Scientists study natural phenomena. The primary tools for this work are their senses. However, there are limits to these instruments. For example, the human eye can resolve objects down to about 0.5 mm. And, as we shall see, there are important worlds to be observed that are smaller than 500 μm. To "see" these smaller worlds, new instruments needed to be invented. The invention of the microscope opened up some of these smaller worlds. It changed the size of the image that we can see (that is, the magnification) and how far apart two objects need to be (that is, resolution).

The next few pages illustrate several important concepts in microscopy.

1. Magnification – the enlargement of the relative size of an object
2. Resolution – the distance apart that two objects must be to be seen as distinct
3. Field of View – the distance left to right or up and down that can be seen from a single spot
4. Depth of Field – the distance between the nearest and farthest images that can be viewed clearly
5. Contrast – the distinctiveness between an object an its background.

The lab exercise that you will perform today will reinforce these concepts and ask you to analyze the relationship among these concepts. Be able to describe what happens to the field of view as magnification increases. What happens to resolution and the depth of field as magnification increases? Finally, how does the iris diaphragm affect both the depth of field and the resolution? Note – we will examine contrast more during the next few weeks when we practice staining techniques.