Epifluorescence

Fluorescence occurs when matter absorbs light and then emits light at a longer wavelength (Figure 1). Microscopes that optically separate these colors are useful for identifying phytoplankton.

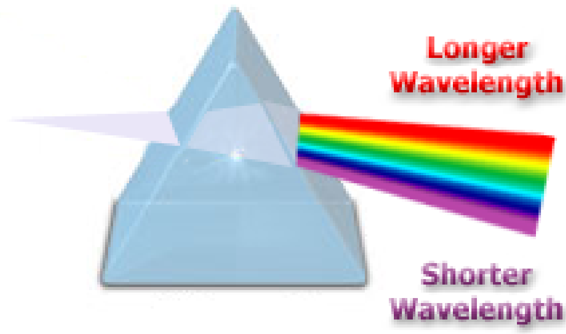

Figure 1: Prism

When excited by blue light, chlorophyll pigments in phytoplankton naturally emit red light (Figure 2).

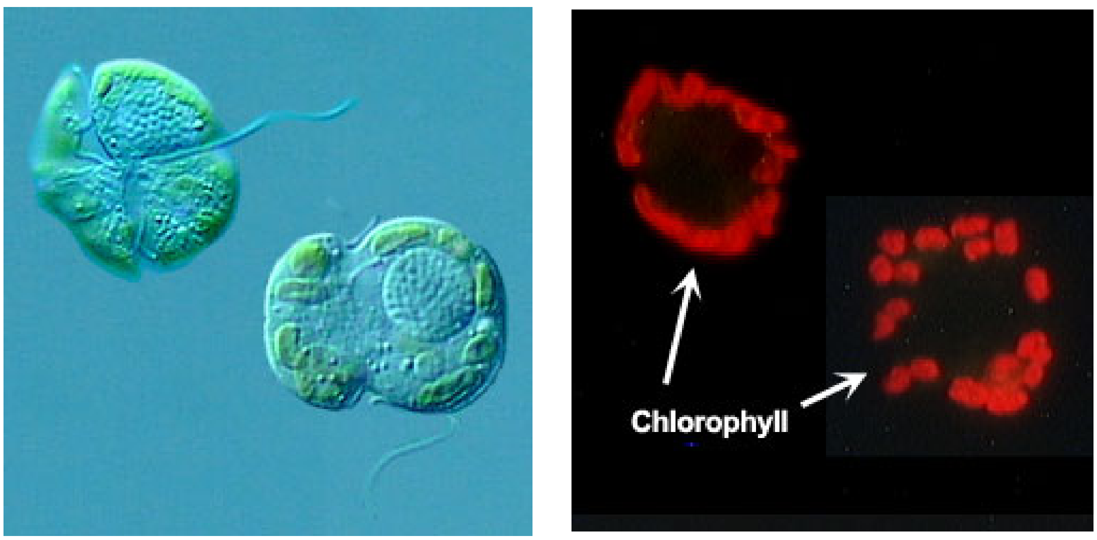

Figure 2: *Karenia brevis* under visible light (left) and under blue light (right)

Another important phytoplankton pigment is phycoerythrin, which fluoresces red when excited by green light (Figure 3). This pigment is used to identify phytoplankton such as cyanobacteria and certain eukaryotes called "cryptophytes."

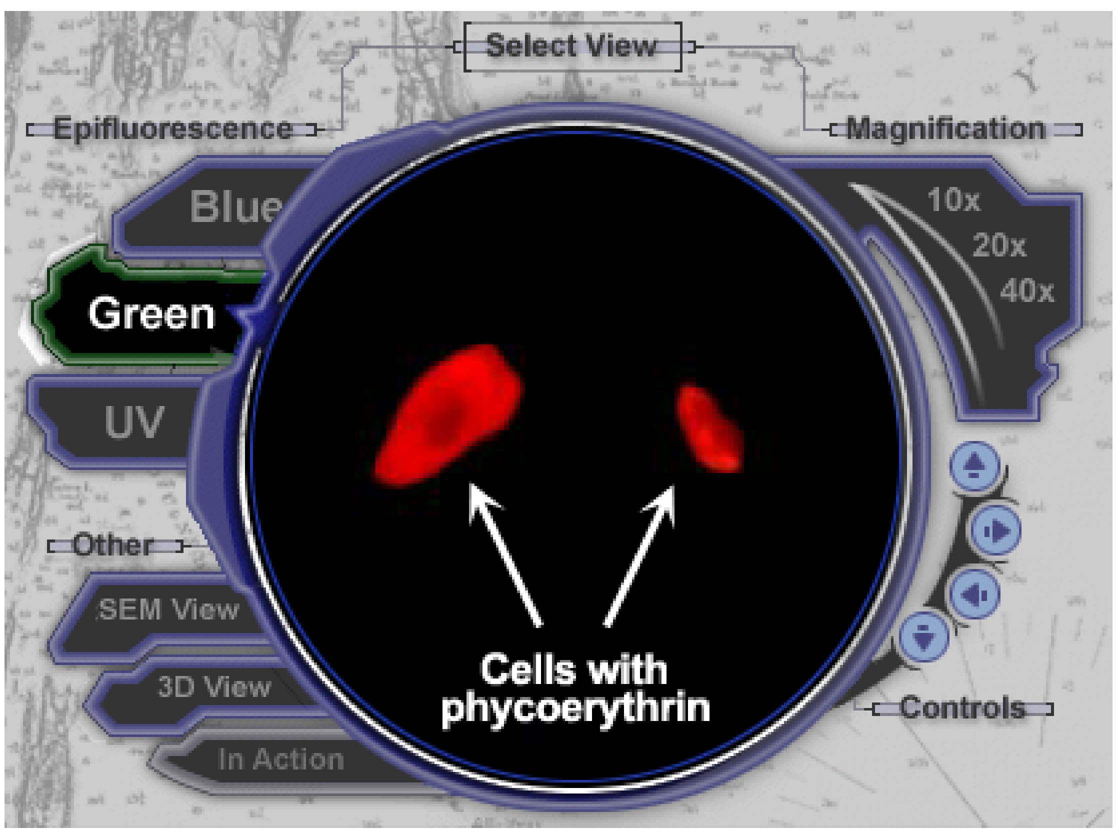

Figure 3: Cells containing Phycoerythrin

Epifluorescence

Other parts of phytoplankton cells do NOT naturally fluoresce. Thus scientists apply stains that bind to their DNA. Our samples have been stained to show the cells' nuclei when viewed under ultraviolet light (Figure 4).

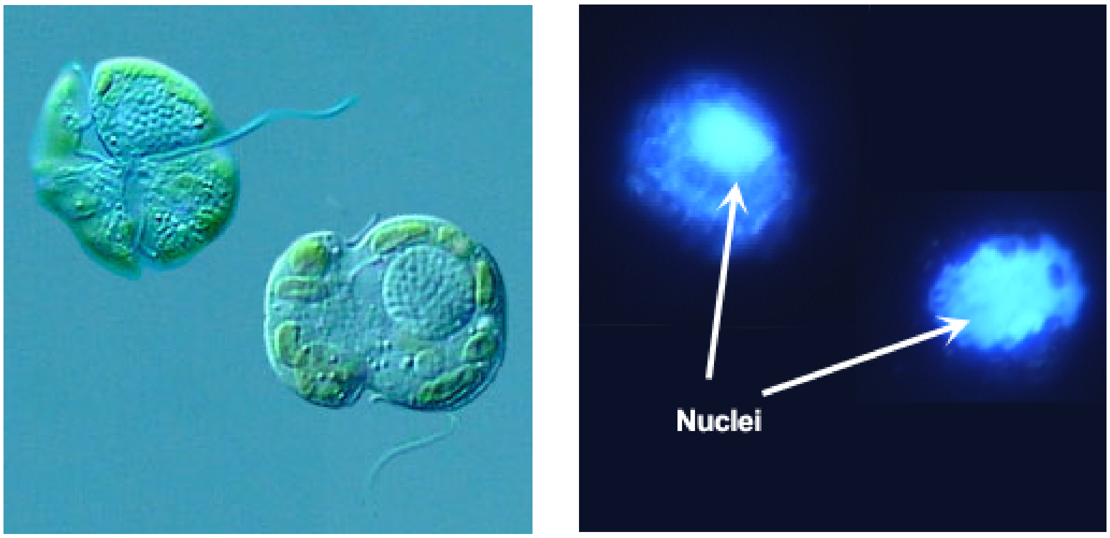

Figure 4: *Karenia brevis* under visible light (left) and under UV light (right).