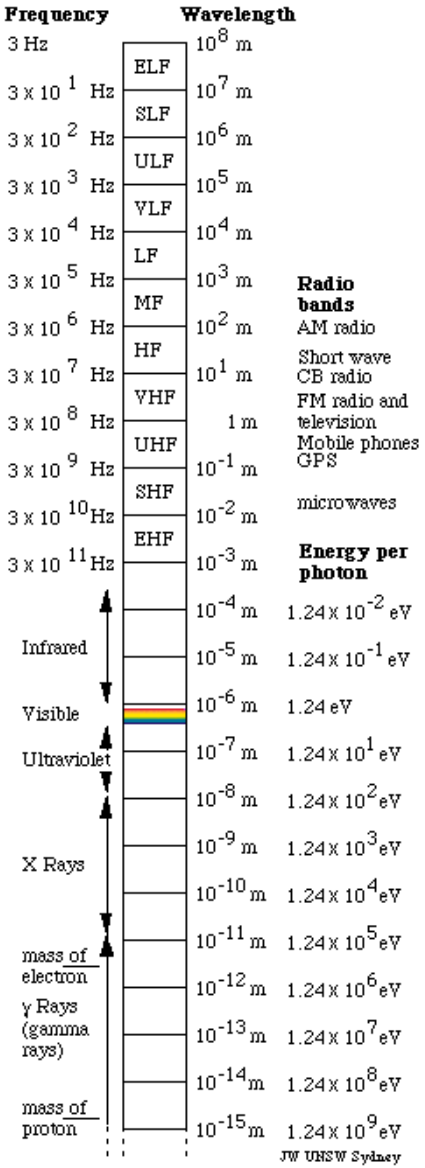
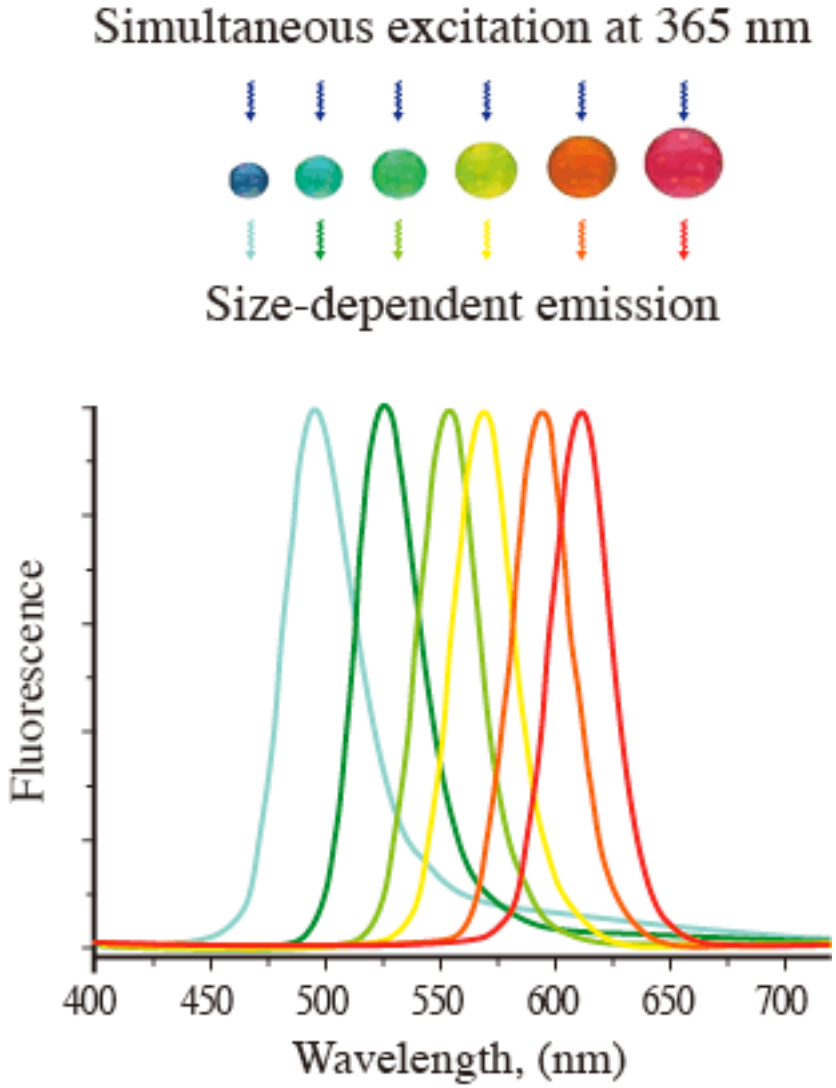
Quantum Mechanics and Artifical and Natural Spectroscopy

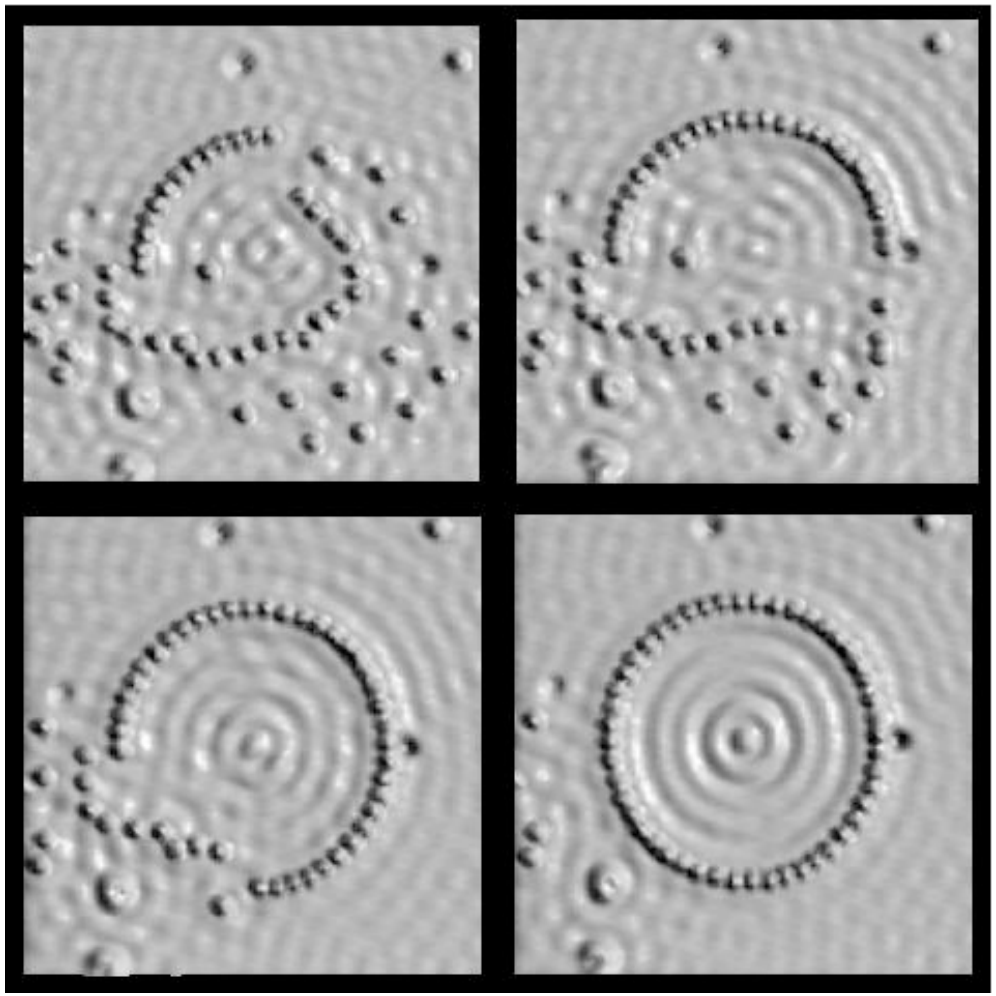
Quantum Mechanics and Artifical and Natural Spectroscopy



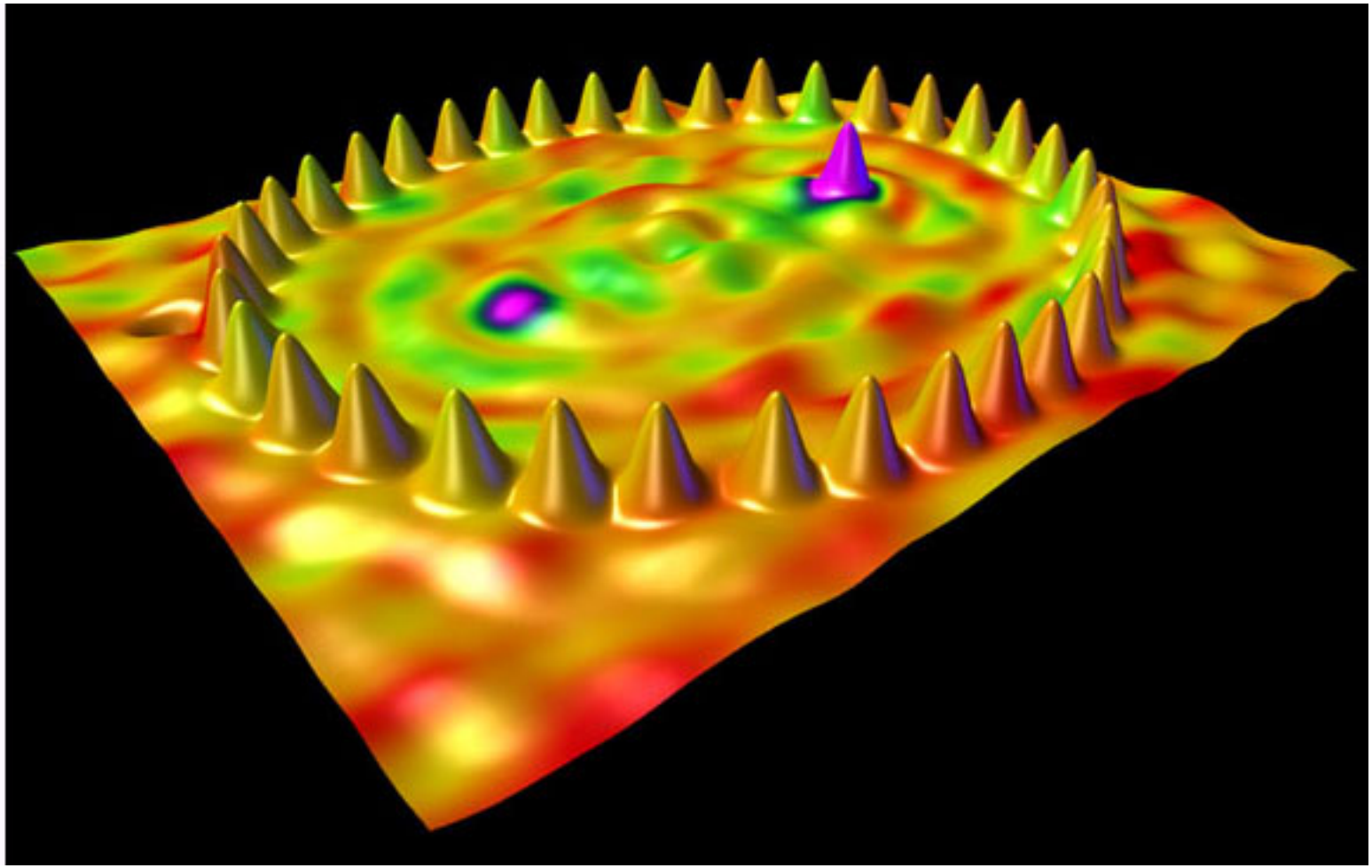


http://www.aist.go.jp/aist_e/aist_today/2006_21/pict/p22_2.png

Quantum Mechanics and Artifical and Natural Spectroscopy



Quantum Mechanics and Artifical and Natural Spectroscopy



Molecules Responsible for Absorption of Light

- *Chlorophyll characterized by a porphyrin ring and a hydrophobic tail which anchors the molecule to the membrane.*
- *The porphyrin ring is host to the electronic states that participate in the interaction with light.*

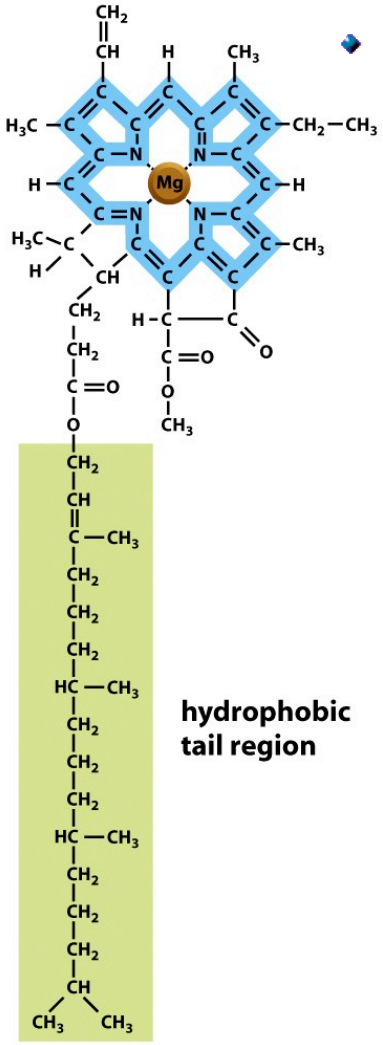


Figure 14-42 Molecular Biology of the Cell 5/e (© Garland Science 2008)

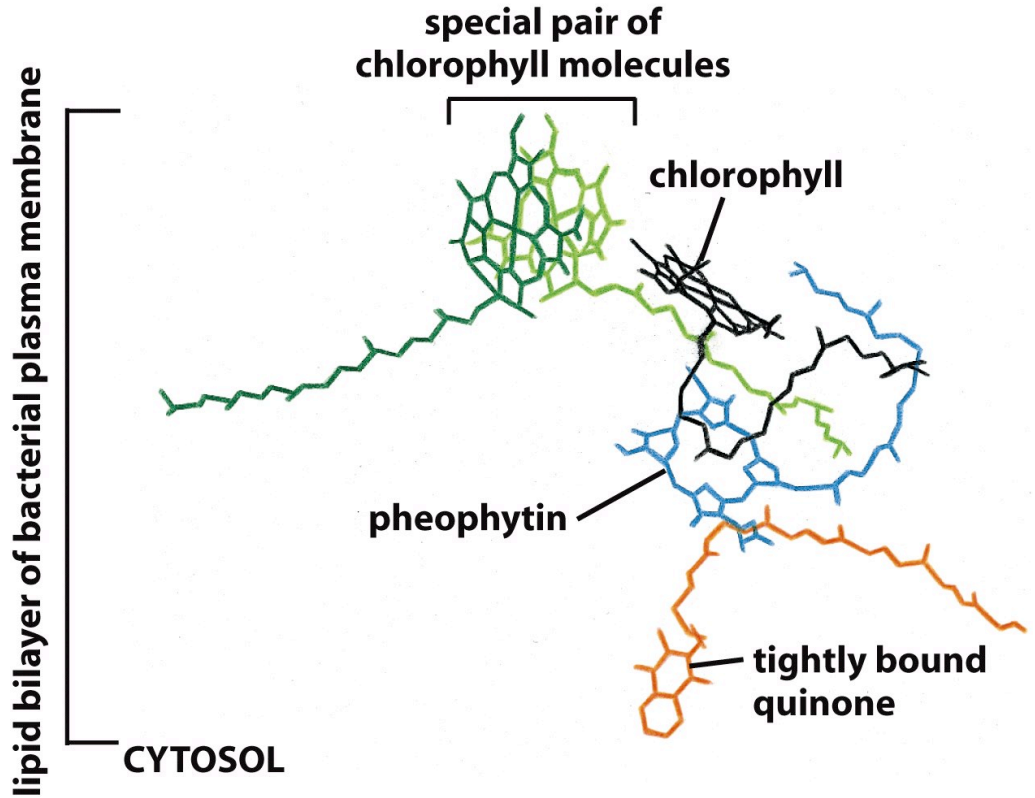
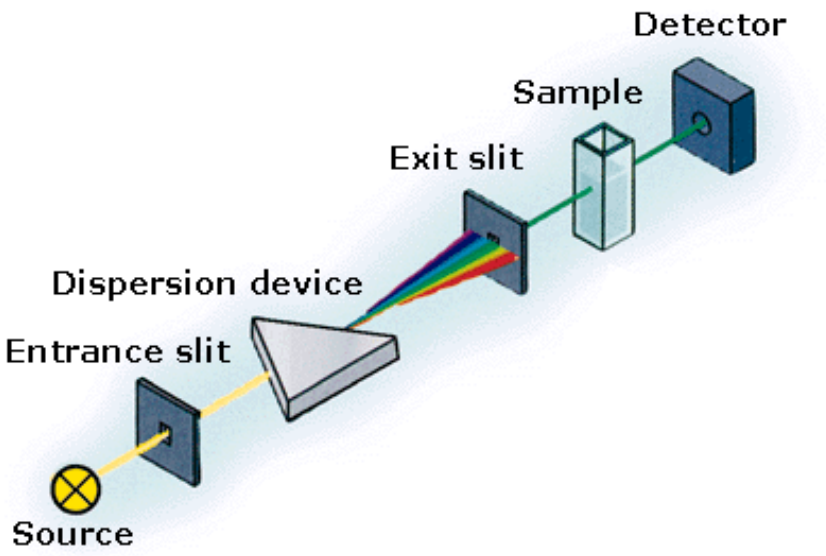
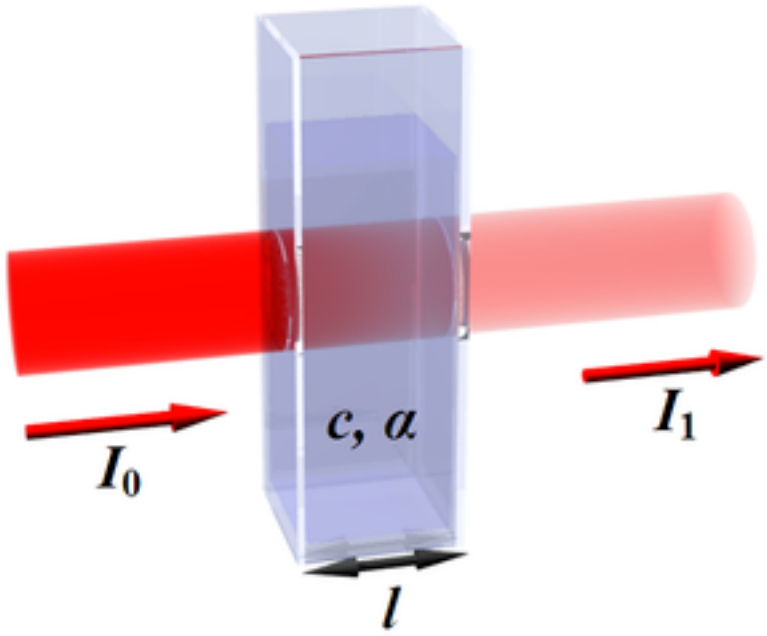


Figure 14-44 Molecular Biology of the Cell 5/e (© Garland Science 2008)

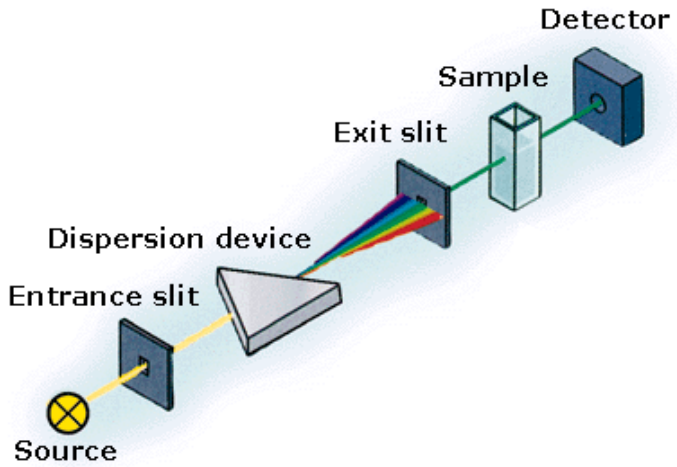
Beer's Law

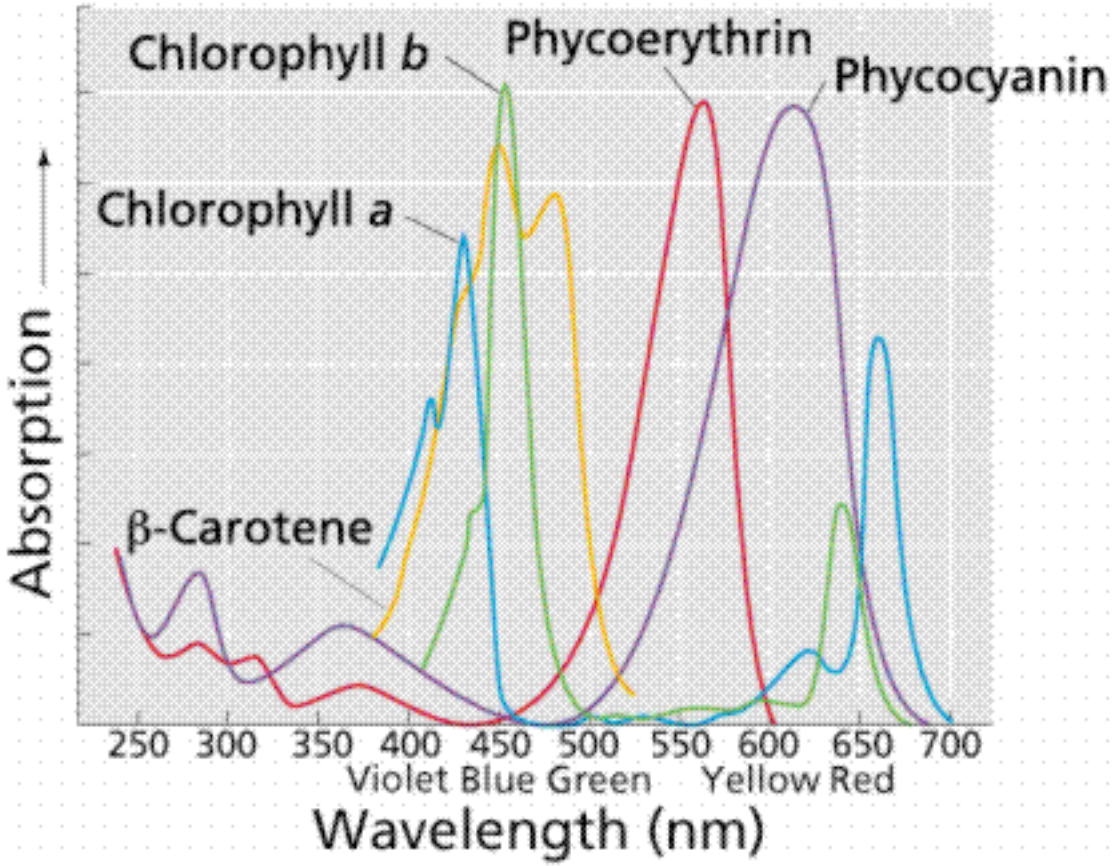

Detector
Sample
Exit slit
Dispersion device
Entrance slit
Source


I_0
c, α
I_1
l

Absorption Spectra of Biological Pigments

- *The spectrophotometer permits the measurement of absorption as a function of the incident wavelength.*
- *Note that chlorophyll appears green because it absorbs strongly in the blue and the red.*
- *We will be interested in examining the quantum mechanical underpinnings of absorption spectra.*





"Linear" Pigments: The Carotenoids