11.64 Vitamin A Functions

Vitamin A has a number of important functions in the body.

**Vision**

The retina is the inner back lining of the eye that takes visual images and turns them into nerve signals that are sent to the brain to form the images that we "see", as shown in the following link\(^1\).

![Web Link](Retina)

Inside the retina are the photoreceptor cells, rods and cones. Cones are responsible for color vision, while rods are important for seeing black and white. Within the rods, 11-cis retinal combines with the protein, opsin, to form rhodopsin. When light strikes rhodopsin, the compound splits into opsin and all-trans retinal. This sends a signal to your brain for us to “see”. This process is illustrated in the figure below\(^1\).

![Figure 11.641 Vitamin A in the rod](Rods_11-cis_retinal_Opsin_Rhodopsin_Opsin_All-trans_retinal)

Most all-trans retinal is converted back to 11-cis retinal through a series of steps so it can continue to be used to form rhodopsin. However, this recycling is not 100% efficient. Vitamin A stores, or continued intake, is required to provide the 11-cis retinal needed to continue to form rhodopsin. Normally, our eyes adapt to darkness by increasing the amount of rhodopsin available so we can see under reduced light conditions\(^1\). If a person does not have enough
rhodopsin he/she will become night blind, meaning their eyes do not adjust, or adjust very slowly, so that he/she can see under limited light conditions.

**Cell Differentiation**

Vitamin A, in particular retinoic acid, is important for cell differentiation, or the ability of stem cells to develop into specialized cells.

![Cellular differentiation](http://en.wikipedia.org/wiki/File:Cell_differentiation.gif)

**Figure 11.642 Cellular differentiation**

Other functions that vitamin A is important for include:

- **Growth & Development**
- **Reproduction**
- **Immune Function**

**References & Links**


**Link**

Retina - [http://webvision.umh.es/webvision/imageswv/Sagschem.jpeg](http://webvision.umh.es/webvision/imageswv/Sagschem.jpeg)