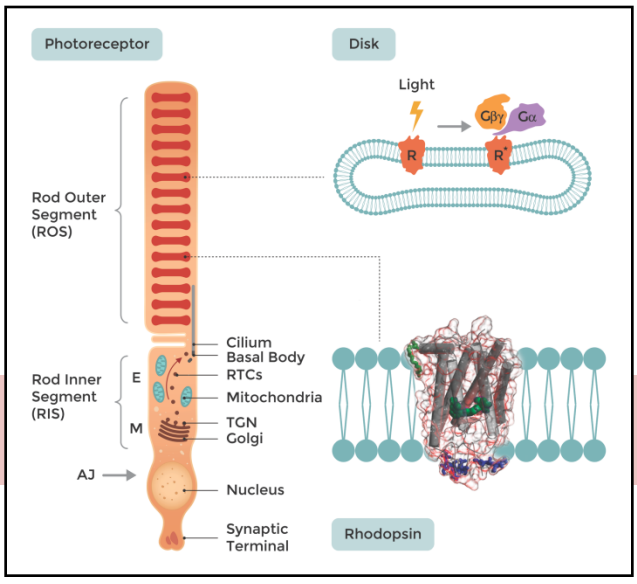
Unlocking the Mystery of Blindness

From the beautiful colors of the rainbow to the dazzling tulip garden, we all enjoy the colors of the wonderful world every day. Seeing the world of colors is such a simple act that we always take it granted. But for **Dusanka Deretic, PhD**, it is a further step forward. She studies the intricate biochemistry of the cell that makes it possible.

The retina, the inner lining of the eyeball, contains almost 120 millions of rod cells and 6 millions of cone cells that make our vision possible. These cells are called “photoreceptors”. Dr. Deretic, PhD, Research Professor of Ophthalmology has dedicated her whole life and career on how these cells function. A world leader in the study of rhodopsin, a molecule that drives these cells, she examines mutations of this molecule in the frog eyes in her lab. “It is an amazing cell in the retina. If it dies, you lose vision,” remarks Dr. Deretic.

Rhodopsin belongs to a group of proteins that maintain healthy photoreceptors. Mutation of these proteins leads to death of these cells. Damage to the photoreceptors results in blindness. Retinitis pigmentosa is a group of rare genetic diseases where the photoreceptors die. Patients lose night vision, and the visual field gets constricted. About 100,000 people in the USA suffer from this disease.



Dr. Deretic’s team has discovered the key proteins, GTPases that direct rhodopsin to cilia and outer part of the cells, rod outer segments. In nature, a stepwise assembly of these complexes maintains vision. Mutation of rhodopsin leads to a defect in assembly of these proteins that causes severe vision loss.

Dr. Deretic's work helps in understanding the molecular underpinnings of inherited retinal diseases. Unlocking the mystery of these complexes may provide novel therapeutic possibilities of future treatments for retinal degenerative diseases for which there is no treatment available currently.

Dusanka Deretic, PhD
Professor

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