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## Biology Faculty Member Given \$360,000 Grant to Study the Optic Nerve

Winthrop University

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### Quick Facts

- Birgbauer wrote in his application for the three-year grant that visual impairment is a significant unmet medical need. Glaucoma is the second leading cause of blindness due to damage to Retinal Ganglion Cells (RGCs) and the optic nerve.
- Damage to the optic nerve from injury or disease, such as glaucoma, is permanent and regrowth does not normally occur. However, during embryonic growth and development of the fetus before birth, he said, vibrant nerve growth does occur.



*Eric Birgbauer*

ROCK HILL, S.C. – The [National Institutes of Health](#) recently awarded a \$360,000 grant to Winthrop University biology faculty member [Eric Birgbauer](#) to continue his studies on how the **optic nerve** grows and can possibly be regenerated.

Birgbauer wrote in his application for the three-year grant that visual impairment is a significant unmet medical need. Glaucoma is the second leading cause of blindness due to damage to **Retinal Ganglion Cells (RGCs)** and the **optic nerve**.

Damage to the optic nerve from injury or disease, such as glaucoma, is permanent and regrowth does not normally occur. However, during **embryonic growth** and **development of the fetus before birth**, he said, vibrant nerve growth does occur.

“We are using embryonic development in chickens to understand how the optic nerve grows and connects normally to find therapies that will induce regeneration after disease or damage,” **Birgbauer** said.

He added that his long-term goal will be to focus on developing therapies to induce **RGC regeneration** to restore sight. His approach is to analyze the normal development of RGC axons and the optic nerve during the time when nerve growth occurs naturally in order to obtain clues for **regenerative therapy**.

“Toward this goal, we are investigating the molecules that guide RGC axons to their correct targets. Specifically, we are analyzing the role of a novel class of signaling molecules, the **lysophospholipids**, specifically lysophosphatidic acid (LPA),” said the assistant professor of biology. “We postulate that LPA, acting through the cognate receptor LPA4, is a guidance molecule for retinal ganglion cell (RGC) axons during development.”

Birgbauer said undergraduate students will help in the investigation to learn analytical skills and an understanding of the scientific process.

For more information, contact **Judy Longshaw**, news and media services manager, at 803/323-2404 or [longshawj@winthrop.edu](mailto:longshawj@winthrop.edu).

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