Exploring New Ways to See the Eye-Brain Connection

Why the Retina Matters

The retina is a thin layer at the back of the eye that connects directly to the brain. Because of this connection, studying the retina can give us clues about brain health. Diseases like Alzheimer's and Parkinson's, as well as eye conditions that cause blindness, can show up in the retina.

What We Aim to Do

We are developing a new method to study how nerve cells in the mouse eye react to light. This research could help us better understand brain diseases and eye problems, potentially leading to new treatments. Our goal is to see how the retina's nerve cells react to different light patterns using a special imaging technique called Spatio-Temporal Optical Coherence Tomography (STOC-T). This method creates detailed, 3D images of the retina, showing how it changes in response to light.

How We'll Do It

1. **Building the Imaging System**: We've designed a unique system that works well with the tiny eyes of mice. This system can capture clear images without losing detail.
2. **Testing Light Patterns**: We'll shine various types of light on the mice eyes, changing how bright it is, how long it lasts, and how it flickers. By watching how the retinal cells respond, we can learn more about their functions.
3. **Analyzing Data**: We'll use advanced computer programs to study the images we capture. This will help us find the best light conditions for studying retinal activity.

Early Results

Our first experiments show that our system can detect tiny changes in the retina of mice. We found even differences in how different type of mice respond to light, proving our method is sensitive and effective.

Why This Matters

This research could change how we study and treat brain and eye diseases. By understanding how the retina responds to light, we can develop better ways to diagnose and treat these conditions. This method could also help us study the effects of new drugs and gene therapies on the retina.

We aim to create a simple, high-quality method for studying the retina. This could lead to big improvements in understanding and treating brain and eye diseases, offering new hope for patients.

Our work highlights the importance of studying the retina to gain insights into overall brain health and pave the way for future medical advancements.