

The University of Iowa

Stephen A. Wynn Institute for Vision Research

The University of Iowa Stephen A. Wynn Institute for Vision Research was created to accelerate the eradication of heritable human blindness through interdisciplinary research, education and clinical care. In August, 2013, the Institute was named for Stephen A. Wynn by the Board of Regents, State of Iowa in recognition of Mr. Wynn's widespread and longstanding philanthropic support of vision research.

The Institute's mission is to develop effective treatments for all forms of genetic blindness, ranging from very common conditions like Age-related Macular Degeneration and Glaucoma that affect millions of people worldwide, to individually rare but collectively common disorders like Retinitis Pigmentosa, Stargardt Disease, Best Disease, Usher Syndrome, and Leber Congenital Amaurosis.

The path to this ambitious goal will take advantage of the intrinsic interchangeability of biological systems to create a series of "reusable parts" that can be combined in a wide variety of ways to engineer effective treatments for every phase of even the rarest genetic eye diseases. Philanthropic support will be especially important to help scientists work across departmental, collegiate and institutional boundaries to develop these reusable tools as rapidly as possible.

The University of Iowa Stephen A. Wynn Institute for Vision Research supports and coordinates the vision research activities of 29 faculty members who work in eight different departments and four colleges of the University of Iowa.

College of Medicine

- Ophthalmology

- Pediatrics

- Biochemistry

- Physiology

College of Engineering

- Biomedical Engineering

- Electrical and Computer Engineering

College of Public Health

- Biostatistics

College of Liberal Arts and Sciences

- Biology

- Statistics and Actuarial Sciences

Using a targeted research approach, and with sufficient resources, scientists of the University of Iowa Stephen A. Wynn Institute for Vision Research are confident that many forms of heritable blindness will become treatable within the next 10 years, and that many patients who have lost vision from one of these disorders will be able to get some of it back. The Institute's pursuit of these ambitious goals are divided into three major efforts:

Genetic Testing. A precise molecular definition of the cause of a patient's disease is critical to the design and delivery of treatment. The John and Marcia Carver Nonprofit Genetic Testing Laboratory at the University of Iowa provides low cost, high quality genetic tests for inherited eye disease for patients living in all 50 states and 60 countries around the world.

Gene Therapy. Gene replacement therapy for inherited retinal disease has been a reality since 1997, when scientists in Philadelphia and Florida first replaced a retinal gene responsible for a form of childhood blindness known as Leber Congenital Amaurosis. In collaboration with scientists at the Children's Hospital of Philadelphia, scientists of the University of Iowa Stephen A. Wynn Institute for Vision Research brought this form of treatment to Iowa in early 2013. The challenge now is to extend this approach to as many other inherited retinal diseases as possible, as rapidly as possible.

Patient-derived Stem Cell Research. University of Iowa Stephen A. Wynn Institute for Vision Research scientists are using patient-derived stem cells to pursue the goal of vision restoration. After taking a small skin biopsy from the patient, skin cells are isolated and reprogrammed to a stem cell state by artificially expressing four genes in a process first described by Nobel Laureate Shinya Yamanaka. The resulting "pluripotent" stem cells are then differentiated into retinal cells to study the mechanism of a patient's disease. In the future, scientists are hopeful that these cells will also be usable to replace retinal cells that have been lost to disease.