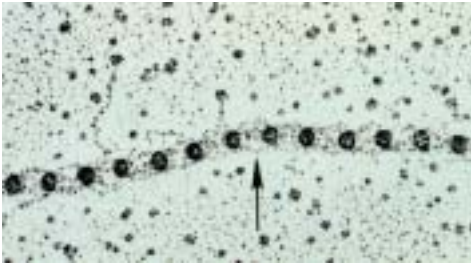


Barbara W. Streeten, M.D.

Ocular Lens Diseases

When light enters the eye, it travels through the cornea, pupil, and lens before it reaches the retina. The lens focuses the light onto the retina where the information is processed and sent to the brain. Diseases of the lens can lead to cataracts, glaucoma, and blindness.



This "beads on a string" structure is a single elastic microfibril, typical of those comprising the zonular fibers, as seen by rotary shadowing. The delicate "strings" (arrow) are made of the protein fibrillin.

Dr. Barbara Streeten focuses her research on diseases of the ocular lens and the zonular fibers that hold the lens in place. A board-certified ophthalmologist, she has advanced our knowledge of abnormal elastic tissue in the eye, particularly the zonular "microfibrils" which are the basic units of the elastic system. If these microfibrils are poorly formed as in several hereditary diseases, the lens becomes dislocated, requiring surgery or treatment for complications of glaucoma and cataract. Dr. Streeten's goal is to understand the mechanism by which abnormal microfibrils disrupt the function of tissues.

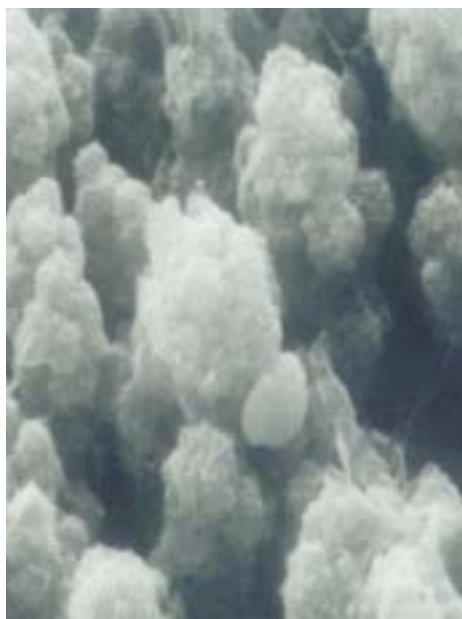
Dr. Streeten is an internationally recognized expert on the pseudoexfoliation syndrome, an important cause of secondary glaucoma in elderly people. In this syndrome, abnormal elastic tissue components are made by the lens epithelial cells, and shed as a dandruff-like material into the eye fluid. These substances clog the pathways by which fluid leaves the eye. When fluid outflow is disrupted, the internal fluid pressure in the eye increases, leading to "open-angle" glaucoma. Dr. Streeten's elastic microfibril theory shows how pseudoexfoliation syndrome is related to the

"We have shown that some of the abnormal elastic material in this disease is widely distributed in the body and are investigating whether it could contribute to clinical disease in these tissues as well as in the eye."



body's elastic system. Her work in identifying these abnormal structural and molecular elastic components will lead to new therapies for glaucoma and its complications.

Another interest of Dr. Streeten's is how elastic tissue develops in the cornea, which normally has none. This occurs in some hereditary diseases and in corneal scarring, resulting in cloudiness of the cornea. Dr. Streeten has also shown that abnormal elastic fibrillar material in the pseudoexfoliation syndrome occurs in other parts of the body, and she is investigating whether this abnormal material can contribute to disease there also.



Clumps of abnormal elastic fibril components deposited on the lens capsule in a patient with pseudoexfoliation glaucoma.

As a result of her achievements, Dr. Streeten has received 27 years of research funding from the National Eye Institute, support from Research to Prevent Blindness, and invitations to speak about her work at other institutions. She has presented her research in journal publications, textbooks, and at meetings of the Association for Research in Vision and Ophthalmology and similar organizations. She has collaborated with leading researchers in the United States and England. Dr. Streeten is particularly grateful to the Lions Club for their interest and support through contributions to the Eye Bank of Central New York and the Department of Ophthalmology.



Large numbers of (blue) zonular fibers, attaching (arrow) all around the peripheral lens to hold it in place.

Dr. Streeten's research requires her to examine tissue at the cellular and molecular levels by electron microscopy. At the CVR, she has worked closely with Drs. Joyce Qi, Hengsheng Fang, and Ann Barker-Griffith who share their expertise in electron microscopy and immunostain-

ing, while Dr. Jerrold Abraham contributes his skill in electron microscopy-energy dispersion x-ray analysis. Drs. Gus Engbretson, Barry Knox, and Robert Barlow provide support in other specialized microscopic techniques.



Dr. Streeten's work is published in 14 professional journals including *Journal of Biological Chemistry*, *Investigative Ophthalmology & Visual Science*, *Archives of Ophthalmology*, *American Journal of Ophthalmology*, *Brain Research*, *Graefe's Archives of Clinical and Experimental Ophthalmology*, *Clinical Immunology and Immunopathology*, and *British Journal of Ophthalmology*. She has served as general editor for *Investigative Ophthalmology and Visual Science* and on the editorial board and editorial advisory committee of *Ophthalmology*. She reviews manuscripts for six journals and has contributed chapters to seven textbooks of ophthalmology, some with multiple editions.

A member of Phi Beta Kappa and Alpha Omega Alpha Honorary Medical Society, Dr. Streeten received the SUNY Upstate Medical University President's Award for Excellence and Leadership in Research for 2000. She received the 1997 Zimmerman Medal for Outstanding Contributions to Ophthalmic Pathology awarded by the American Association of Ophthalmic Pathologists. She was also the 1997 Zimmerman Lecturer at the Joint Symposium of the American Academy of Ophthalmology and American Association of Ophthalmic Pathologists and Guest of Honor at the 1992 European Ophthalmic Pathology Society Meeting in Strasbourg, France. She received the 1991 Award for Excellence from the State University of New York and the United University Professionals Organization and a 1990 Honor Award of the American Academy of Ophthalmology.

Dr. Streeten is a member of eight professional societies and has held office in several. She has served as consultant to the National Advisory Eye Council's Program Planning Subcommittee and submitted an invited report, "Vision Research – A National Plan: 1978-1982, on Directions for Research in Dislocation of the Lens." She also served for three years on an NIH Research Study Section and on the Board of Scientific Counselors, National Eye Institute.