

BIOGRAPHICAL SKETCH

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NAME: Stephen C. Pflugfelder

eRA COMMONS USER NAME (credential, e.g., agency login): STEVENP

POSITION TITLE: Professor and James & Margaret Elkins Chair, Director of the Ocular Surface Center, Department of Ophthalmology, Baylor College of Medicine

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Colgate University, Hamilton, NY	B.A.	05/1977	Biology
SUNY Upstate Medical College, Syracuse, NY	M.D.	05/1981	Medicine
Presbyterian University of Pennsylvania Medical Center, Philadelphia, PA		07/1982	Internship
Baylor College of Medicine, Houston, TX		07/1985	Ophthalmology Residency
University of Miami School of Medicine		07/1986	Cornea Fellowship

A. Personal Statement

I am a clinician scientist with a 30-year interest in the pathogenesis of the ocular surface disease that develops in dry eye. Our Ocular Surface Center at Baylor College of Medicine has discovered that dryness and desiccating stress initiates immune based inflammation that promotes disease of the cornea and conjunctival epithelium. Our center has identified key mediators/pathways involved in the pathogenesis of the ocular surface disease of dry eye (summarized in the referenced reviews). Our current work is focused on developing an infrared laser to shrink redundant conjunctiva in patients with conjunctivochalasis which is a major cause of chronic inflammation and discomfort in the aging eye.

- a. Pflugfelder SC, Stern ME. Mucosal environmental sensors in the pathogenesis of dry eye. *Expert Rev Clin Immunol.* 2014; 30:1-4. **PMID: 25075545**
- b. Pflugfelder SC De Paiva C. The pathophysiology of dry eye disease: What we know and future directions for research. *Ophthalmology.* 2017; 124(11S):S4-S13. **PMID:29055361**
- c. Alam J, de Paiva CS, Pflugfelder SC. Immune - Goblet Cell Interaction in the Conjunctiva. *The ocular surface.* 2020; 18:326-334. **PMID: 31953222**
- d. Yang J, Chandwani R, Gopinath V, Boyce T, Pflugfelder SC et al. Near-infrared laser thermal conjunctivoplasty. *Scientific reports.* Mar 1 2018;8(1):3863. doi:10.1038/s41598-018-22204-0 **PMID: 29497112**

B. Positions, Scientific Appointments, and Honors**Positions and Employment**

1984-1985 Chief Resident and Ophthalmology Instructor - Cullen Eye Institute, Baylor College of Medicine, Houston, Texas

1985-1986	Cornea and External Disease Fellowship and Ophthalmology Instructor - Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida
1986-1992	Assistant Professor of Ophthalmology - Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida
1992-1998	Associate Professor of Ophthalmology- Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida
1998-2000	Professor of Ophthalmology- Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida
2000-present	Professor of Ophthalmology, James and Margaret Elkins Chair, Ophthalmology Department - Baylor College of Medicine, Houston, TX
2018-2020	Clinical Professor, Ophthalmology Division of Head and Neck Surgery, The University of Texas MD Anderson Cancer Center

Other Experience and Professional Memberships

1998-2013	Editorial Board of <i>Cornea</i>
2002-2017	Editorial Board and Associate Editor of <i>American Journal of Ophthalmology</i>
2002-2102	Editorial Board of <i>Eye and Contact Lens</i>
2002-present	Editorial Board of <i>Ocular Surface</i>
2000-2005	Secretary, Tear Film & Ocular Surface Society (TFOS)
2007-2018	Associate Editor of <i>Investigative Ophthalmology and Visual Science</i>
2014-2017	Editorial Board of <i>Scientific Reports</i>
2009-2018	President, International Ocular Surface Society
2017-2021	ARVO Board of Directors, Cornea trustee
2021-2022	ARVO President

Awards and Honors

1991	American Academy of Ophthalmology Honor Award
1990	Outstanding Professor Award for resident education, Bascom Palmer Eye Institute
2000	American Academy of Ophthalmology Senior Honor Award
2000	Named in America's Top Physicians. Consumers' Research Council of America
2001	James and Margaret Elkins Chair, Department of Ophthalmology, Baylor College of Medicine
2002	Research to Prevent Blindness Senior Investigator Award
2003	Best Doctors in Southeastern America, Woodward/White, Inc
2005	Best Doctors in America, Woodward/White, Inc,
2005-2019	Texas Super Doctors, Texas Monthly
2006-2019	Americas Top Doctors, Castle Connolly
2011	LXVII Edward Jackson Memorial Lecture, American Academy of Ophthalmology
2012	Best of the Best Cless Award, University of Illinois Eye and Ear Infirmary
2016	Master Clinician Award, Baylor College of Medicine
2018	American Academy of Ophthalmology Lifetime Achievement Award
2019	Binkhorst Medal Lecture, American Society of Cataract and Refractive Surgeons

C. Contributions to Science

1. My early research was directed toward improving diagnosis and characterization of dry eye. My published studies identified shared and unique features of different tear dysfunction conditions. These studies found that ocular surface inflammation is a common feature of dry eye. In particular, we showed that activity of the inflammatory protease MMP-9 increases in the tears in aqueous sufficient and deficient tear disorders. MMP-9 is now used as a biomarker for dry eye/tear dysfunction. We have found that conjunctival goblet cell loss occurs in aqueous tear deficiency and is associated with greater ocular surface inflammation and epithelial disease. These findings have led to a major change in perception of dry eye from simply a tear deficiency to a disease of altered tear composition that can no longer adequately support and protect the ocular surface. We also developed a desiccation stress model of dry eye in mice that has been used extensively in pathogenesis studies performed in our lab and that has become the standard model used by many dry eye researchers worldwide. I have performed studies to improve imaging of conjunctivochalasis and compare healing response from cautery and infrared laser conjunctivoplasty.

- a. Jones DT, Yen M, Monroy D, Ji X, Atherton SS, Pflugfelder SC. Sjogren's syndrome: cytokine and Epstein Barr viral gene expression within the conjunctival epithelium. *Invest Ophthalmol Vis Sci* 1994; 35:3493-3504. **PMID: 8056525**
 - b. Pflugfelder SC, Tseng SCG, Yoshino K, Monroy D, Felix C, Reis B. Correlation of goblet cell density and mucosal epithelial mucin expression with rose bengal staining in patients with ocular irritation. *Ophthalmology* 1997; 104:223-235. **PMID: 90526262**
 - c. Gumus K, Pflugfelder SC. Increasing prevalence and severity of conjunctivochalasis with aging detected by anterior segment optical coherence tomography. *American journal of ophthalmology*. Feb 2013;155(2):238-242.e2. doi:10.1016/j.ajo.2012.07.014 **PMID: 23036571**
 - d. de Souza RG, Huang D, Prah S, Nakhleh L, Pflugfelder SC. Comparison of Efficacy and Inflammatory Response to Thermoconjunctivoplasty Performed with Cautery or Pulsed 1460 nm Laser. *International journal of molecular sciences*. Mar 17 2023;24(6)doi:10.3390/ijms24065740 **PMID:36982810**
2. In the last fifteen years, we have used our mouse dry eye model in numerous studies investigating the pathogenesis of the ocular surface disease in dry eye and we developed a model to adoptively transfer T cells from dry eye donor mice to naïve recipients. These studies have found that IL-17 produced by Th17 cells stimulates production of MMPs that disrupt corneal barrier function and IFN- γ from monocyte/macrophage, Th1 and NK cells that causes apoptosis of the ocular surface epithelium and inhibits conjunctival goblet cell differentiation and mucin production. We have also found that the Th2 cytokine IL-13 stimulates goblet cell proliferation and production of mucus and immunomodulatory factors. Loss of conjunctival goblet cells is associated with a higher number of mature antigen presenting cells and this is due in part to loss of goblet cell produced retinoic acid. These findings form the basis for our current investigations of the functional immunomodulatory properties of conjunctival goblet cells and the conditioning activity of retinoid nuclear receptors. These studies have provided important new insight into the mechanisms responsible for inflammatory mediated ocular surface disease. The following publications report significant findings during this 15-year period (selected from 185 peer-reviewed publications).
- a. Niederkorn JY, Stern ME, Pflugfelder SC, de Paiva CS, Corrales RM, Gao J, Siemasko K. Desiccating stress induces T cell-mediated Sjogren's Syndrome-like lacrimal keratoconjunctivitis. *J Immunol*. 2006;176:3950-7. **PMID: 6547229**
 - b. Tuckler Henriksson JC, T.G.; Corry, D.B.; DePaiva, C.S.; Pflugfelder, S.C. IL-13 stimulates proliferation and expression of mucins and immunomodulatory gene in cultured conjunctival goblet cells. *Investigative ophthalmology & visual science*. 2015;56: 4186-97. **PMID: 26132778**
 - c. Ko BY, Xiao Y, Barbosa FL, de Paiva CS, Pflugfelder SC. Goblet cell loss abrogates ocular surface immune tolerance. *JCI Insight*. 2018 Feb 8;3(3). pii: 98222. doi: 10.1172/jci.insight.98222. [Epub ahead of print] **PMID: 29415888**
 - d. Xiao Y, De Paiva CS, Yu Z, Guimaraes de Souza R, Li DQ, Pflugfelder SC. Goblet cell produced retinoic acid suppresses CD86 expression and IL-12 production in bone marrow derived cells. *Int Immunol*. 2018 Jul 12. doi: 10.1093/intimm/dxy045. [Epub ahead of print] **PMID: 30010888**
3. Our group has also characterized the ocular surface inflammation that develops in human dry eye disease using a number of techniques that have been developed or refined by our group. We have also investigated the acute ocular surface response to experimental desiccation.
- a. Lam H, Bleiden L, de Paiva CS, Farley W, Stern ME, Pflugfelder SC. Tear cytokine profiles in dysfunctional tear syndrome. *Am J Ophthalmol*. 2009;147:198-205. **PMID: 18992869**
 - b. Moore QL, DePaiva CS, Pflugfelder SC. Effects of dry eye therapies on environmentally induced ocular surface disease. *Am J Ophthalmol* 2015;160(1):135-42 **PMID: 25868759**
 - c. Pflugfelder SC, Moore QL, Volpe EA, Li DQ, Gumus K, Zaheer ML, Corrales RM. Aqueous tear deficiency increases conjunctival interferon-gamma (IFN- γ) expression and goblet cell loss. *Investigative ophthalmology & visual science*. 2015;56(12):7545-50. **PMID: 26618646**
 - d. Coursey TG, Tukler Henriksson J, Barbosa FL, de Paiva CS, Pflugfelder SC. Interferon-gamma-Induced Unfolded Protein Response in Conjunctival Goblet Cells as a Cause of Mucin Deficiency in Sjogren Syndrome. *The American journal of pathology*. 2016;186(6):1547-58. **PMID: 27085137**

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/myncbi/stephen.pflugfelder.1/bibliography/40323596/public/?sort=date&direction=ascending>