Detection of the abnormality in light scattering at the basement membrane of the cornea in diabetic patients with a new device

Norihisa Takahashi¹, Makiko Wakuta¹, Naoyuki Morishige¹, Tai-ichiro Chikama¹, Teruo Nishida², Yasuhiro Sumii²

¹Department of Biomolecular Recognition and Ophthalmology, Yamaguchi University School of Medicine, ²Konan Medical Inc.

Eosinophils promote the proliferation of and extracellular matrix synthesis by conjunctival fibroblasts

Ken Fukuda, Youichiro Fujitsu, Naoki Kumagai, Teruo Nishida

Department of Biomolecular Recognition and Ophthalmology, Yamaguchi University School of Medicine

The detection of abnormal light scattering at the basement membrane of the cornea in diabetic patients using a new device was investigated. Light scattering intensity (mean ± SD) was 28.1 ± 4.8 in nondiabetic subjects, 35.7 ± 6.3 in diabetic subjects with vascular hyperpermeability, and 42.7 ± 8.6 in diabetic subjects with vascular occlusion. These data suggest that the reproducibility of the LSDS is sufficient for its use in the clinical setting. Furthermore, light scattering increased in a manner dependent on the stage of diabetic retinopathy. We conclude that the LSDS is a useful device for early detection of the abnormality of the corneal epithelial basement membrane in diabetic patients.

Eosinophils promote the proliferation of and extracellular matrix synthesis by conjunctival fibroblasts. Eosinophils were cultured in the presence or absence of IL-5 for 48 h, and the conditioned medium was collected. Culture of conjunctival fibroblasts with cell-free conditioned medium induced cell proliferation in a manner dependent on the number of eosinophils from which the CM was derived. The mitogenic effect of CM from IL-5–stimulated eosinophils was greater than that of CM obtained from unstimulated eosinophils. Enzyme immunoassays revealed that the eosinophil CM also increased the amounts of both fibronectin and the C peptide derived from procollagen type I released by conjunctival fibroblasts. These effects were dependent on the number of eosinophils from which the CM was derived. Our results suggest that a factor (or factors) secreted by eosinophils promotes both the proliferation of and the production of extracellular matrix proteins by conjunctival fibroblasts. These effects of eosinophil-fibroblast interaction might thus contribute to the formation of giant papillae in individuals with vernal keratoconjunctivitis.