Research Highlight

Experimental Evidence of Fluid Secretion of Rabbit Lacrimal Gland Duct Epithelium

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The lacrimal gland (LG) is the major source of tears that lubricate, nourish, and protect the integrity and function of the eye, most notably the ocular surface. Dysfunction of the LG may cause dry eye, the most common disease in eye clinics. While most of the research has focused on the acinar cells, little is known about the ductal cells, although these cells long have been suggested to have a role in LG fluids secretion and absorption.

In the current issue of *Investigative Ophthalmology and Visual Science*, Katona et al.[1] employed the novel technique they developed several years ago, clarified the myth, and gave us an unequivocal answer that ductal cells, indeed, can secrete on their own. By using perfused isolated rabbit LG ducts, with both ends of the duct sealed after overnight incubation and, therefore, forming a closed luminal space, they observed a rapid and sustained secretory response from these ducts in response to forskolin, which was completely inhibited by bumetanide. On the other hand, carbachol elicited a rapid, but short, secretion from these ducts, which was blocked completely by atropine.

These studies showed, for the first time, direct observation of the LG duct's ability to secrete by themselves. This is critical information as it confirmed earlier notions of functional role of these ducts in LG secretion, and paved the way for future drug development to treat dry eye by targeting these ducts.

Artificial tears currently are the major approach to manage dry eye, but only alleviate the symptoms on a temporary basis, without treating the root cause of the disease. While the etiology of dry eye is hugely diverse and largely unknown, most of the previous efforts have focused on acinar cells, without adequate consideration of these ducts. The LG ducts clearly are underinvestigated, and, therefore, the data presented are especially valuable.

References

1. Katona M, Vizvári E, Németh L, et al. Experimental evidence of fluid secretion of rabbit lacrimal gland duct epithelium. *Invest Ophthalmol Vis Sci*. 2014;55:4360–4367.

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