

DA-6034, a Novel Cytoprotective Flavone, Facilitates Mucin like Glycoprotein Secretion in Animal and Human Conjunctival Cells

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Background and aims: DA-6034 (7-carboxymethoxy-3',4',5-trimethoxy flavone) is a new synthetic flavone showing anti-inflammatory and cytoprotective effects. This study was designed to assess whether DA-6034 increases secretion of mucin-like glycoprotein both in vitro and in vivo.

Methods: Human corneal epithelial cells were incubated with DA-6034 (1-250uM). To investigate mucin secreting activity more directly, isolated rat conjunctival goblet cells were also used. Aqueous tear production, total protein levels and glycoprotein levels in normal rabbits were evaluated after topical application of DA-6034 (0.3, 1, and 3%). Moreover, time-course aqueous tear volume measurement was performed in dry eyes of rabbits that had been given 1% atropine sulfate, topically.

Results: DA-6034 increased mucin-like glycoprotein levels in corneal epithelial cells at concentrations above 100uM. DA-6034 also significantly increased MUC5AC production from conjunctival goblet cells isolated from rats. A single topical application of DA-6034 significantly increased ($p<0.05$) aqueous tear production in a concentration-dependent manner in normal rabbits. There was no change in total protein levels while glycoprotein levels were significantly increased in 3% DA-6034 treated eyes. The increase in aqueous tear fluid was significant compared to vehicle group ($p<0.05$) and lasted for 2h post instillation in eyes of rabbits that had been given 1% atropine sulfate.

Conclusions: These results suggest that DA-6034 might have therapeutic role for the treatment of dry eye through its facilitation of mucin-like glycoprotein secretion.