Non-gel Sieving of Tear Proteins

Changes in tear protein concentrations may occur as a result of disease or contact lens use. Lysozyme, albumin, lactoferrin, and gammaglobulin are among proteins found in tears. Their isoelectric points range from 5 – 10 and their molecular weights from 14 to 150 kilodaltons. A run buffer < pH 4 is required to mobilize these proteins in the direction of the detector during capillary electrophoresis. Since close mass-to-charge ratios at low pH prevent resolution of all four proteins, a size separation can be achieved by the use of a longer capillary and addition of linear polymers to the run buffer.

Without sieving agents

1. Lysozyme
2. Albumin
3. Lactoferrin
4. Gammaglobulin

With sieving agents

1. Lysozyme
2. Albumin
3. Lactoferrin
4. Gammaglobulin

Capillary: 20 cm x 25 μm (left) and 35 cm x 50 μm (right), coated
Buffer: 0.1 M sodium phosphate, pH 2.1 (linear polymers in separation on right)
Load Conditions: 8 kV, 8 seconds
Run Conditions: 10 kV, constant voltage, +→− polarity
Detection: UV, 200 nm, 0.5 AUFS