INTRODUCTION

The most common proteins such as lipocalin, lactoferrin, alpha-1-protease inhibitors, albumin, transcorneal, lipofuscin, and lysozyme are highly concentrated on the surface of the eye. When proteins are deposited as a contact lens (CL), they may be bound to the base polymer of the lens.1,2 “Much of the traditional research on contact lenses has focused on the side effects that contact solutions have on the ocular surface.3-5 With the patient’s well-being in mind, the goal of the study was to understand the differences in the protein content between contact lenses (CLs). It is critical that we fully understand the entire CL care solution chemistry.

METHODS

Study Design and Patient Sample

- Approved by Biomedical IRB in accordance with the ethical standards of the Declaration of Helsinki.
- This was a two-armed pilot study involving 10 subjects.
- Inclusion criteria: 18-21 years old, ACUVUE® Advance™ wearers.
- Exclusion criteria: Keratoconus, advanced dry eye conditions.
- Contact lenses were switched to the experiment at various assigned care solutions on a random assignment basis.
- After the lens extraction, the solutions were collected and proteins were precipitated using trichloroacetic acid.

Experimental Procedure

- Extraction and Precipitation
- Proteins were extracted and precipitated in 10 contact lenses per arm.
- The extracted proteins were then precipitated using trichloroacetic acid.
- The precipitated proteins were then pelleted by centrifugation and resuspended in water.

RESULTS

Quantification

1. Sodium Dodecyl Sulfate – Polyacrylamide Gel Electrophoresis (SDS-PAGE)

- Sequence information from the MS/MS data was used on each sample to analyze the protein mass bound to SH lenses after lens removal.
- These sequences correspond with a recent in vitro study of ACUVUE® Advance™, which found that the O2Optix polymer may interact and bind with many known tear proteins.4 This higher protein quantity might be due to the nature of the additional protein.

Identification

- Identification of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of lipocalin and proline-rich proteins within the CL or lens itself.
- These lipocalin bands were observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.

Identification

- Identification and characterization of the lipocalin family was observed in Band C.
- The presence of lipocalin was confirmed by analyzing the bands within each sample on the basis of molecular weight and are separated on the basis of molecular weight.