US008802651B2

(12) **United States Patent**
Gwon

(10) **Patent No.: US 8,802,651 B2**
(45) **Date of Patent: Aug. 12, 2014**

(54) **HYALURONIC ACID IN THE ENHANCEMENT OF LENS REGENERATION**

(75) Inventor: **Arlene Gwon**, Newport Beach, CA (US)

(73) Assignee: **Abbott Medical Optics Inc.**, Santa Ana, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 2345 days.

(21) Appl. No.: **10/881,426**

(22) Filed: **Jun. 30, 2004**

(65) **Prior Publication Data**

US 2006/0002981 A1 Jan. 5, 2006

(51) **Int. Cl.**

A01N 43/04	(2006.01)
A61K 31/715	(2006.01)
A61K 31/728	(2006.01)
A61K 38/39	(2006.01)

(52) **U.S. Cl.**

CPC ***A61K 31/728*** (2013.01); ***A61K 38/39*** (2013.01)

USPC **514/54**

(58) **Field of Classification Search**

USPC 514/54

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,764,360	A	8/1988	Malson
5,213,579	A	5/1993	Yamada et al.
5,627,162	A	5/1997	Gwon et al.
5,681,825	A	10/1997	Lindqvist et al.
5,792,103	A	8/1998	Schwartz et al.
6,066,172	A	5/2000	Huo et al.
6,086,597	A	7/2000	Fergeus et al.
6,090,596	A	7/2000	Ståhl
6,322,556	B1	11/2001	Gwon et al.
6,368,585	B1	4/2002	Fergeus et al.
6,440,911	B1	8/2002	Bettiol et al.
6,537,795	B1	3/2003	Ståhl
6,558,688	B2	5/2003	Saishin et al.
6,945,971	B1	9/2005	Gwon
7,278,990	B2	10/2007	Gwon
7,741,091	B2	6/2010	DeAngelis et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP	0760863 B1	7/2002
WO	WO 92/14420	3/1992

(Continued)

OTHER PUBLICATIONS

Puhl et al, Intra-articular hyaluronan treatment for osteoarthritis, Annals of the Rheumatic Diseases 1997;56:438-441.*

(Continued)

Primary Examiner — Benjamin Packard

(74) *Attorney, Agent, or Firm* — Abbott Medical Optics Inc.

(57) **ABSTRACT**

The present invention addresses the treatment of ocular conditions by the enhancement of lens regeneration. This is accomplished by the administration of a high viscosity composition including a hyaluronic acid compound. Excess high viscosity composition may be removed by focal laser photophacoablation. Additionally, a collagen product may be injected within the lens capsule to improve lens cell proliferation and differentiation, and to improve the configuration, shape and structure of regenerated lenses. Various embodiments involving the enhancement of lens regeneration are described. For example, lens regeneration may be enhanced by filling the lens capsule bag with the inventive hyaluronic acid compound; by inserting at least one collagen patch in the lens capsule; and/or by injecting a collagen-based product into the lens capsule.

19 Claims, 7 Drawing Sheets