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(54) **FIXED DOSE COMBINATIONS AND FORMULATIONS COMPRISING ETC1002 AND EZETIMIBE AND METHODS OF TREATING OR REDUCING THE RISK OF CARDIOVASCULAR DISEASE**

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,152,148 A 10/1964 Easterly et al.
3,441,605 A 4/1969 Blake
3,773,946 A 11/1973 Creger
3,930,024 A 12/1975 Creger
4,281,200 A 7/1981 Snoble
4,287,200 A 9/1981 Kawa et al.
4,584,321 A 4/1986 Manghisi et al.
4,613,593 A 9/1986 Yamatsu et al.
4,634,119 A 1/1987 Pesthy
4,634,719 A 1/1987 Takaishi et al.
4,639,344 A 1/1987 Ueno et al.

4,689,344 A 8/1987 Bar-Tana
4,711,896 A 12/1987 Bar-Tana et al.
4,714,762 A 12/1987 Hoefle et al.
4,896,344 A 1/1990 Grady et al.
5,166,174 A 11/1992 Ueno et al.
5,225,439 A 7/1993 Ueno et al.
5,284,858 A 2/1994 Ueno et al.
5,380,709 A 1/1995 Ueno et al.
5,428,062 A 6/1995 Ueno et al.
5,502,198 A 3/1996 Picard et al.
5,504,073 A 4/1996 Homan
5,570,569 A 11/1996 Masuda
5,578,639 A 11/1996 Homan
5,633,287 A 5/1997 Lee et al.
5,648,387 A 7/1997 Bisgaier et al.
5,750,569 A 5/1998 Bisgaier et al.
5,756,344 A 5/1998 Onda et al.
5,756,544 A 5/1998 Bisgaier et al.
5,783,600 A 7/1998 Bisgaier et al.
5,834,596 A 11/1998 Ageland et al.
5,886,034 A 3/1999 Ueno et al.
5,968,963 A 10/1999 Homan
5,981,595 A 11/1999 Picard et al.
6,004,925 A 12/1999 Dasseux et al.
6,017,905 A 1/2000 Roark et al.
6,037,323 A 3/2000 Dasseux et al.
6,093,719 A 7/2000 Bocan
6,093,744 A 7/2000 Lee et al.
6,124,309 A 9/2000 Bocan
6,143,755 A 11/2000 Bocan
6,207,822 B1 3/2001 Thiruvengadam et al.
6,362,236 B1 3/2002 Aviram et al.

(Continued)

FOREIGN PATENT DOCUMENTS

BR PI0318046 B1 3/2019
CA 2513660 A1 8/2004

(Continued)

OTHER PUBLICATIONS

Ackerly, et al., 1995, "A novel approach to dual-acting thromboxane receptor antagonist/synthase inhibitors based on the link of 1,3-dioxane-thromboxane receptor antagonists and -thromboxane synthase inhibitors", J. Med. Chem. 38:1608-1628.

Acton, et al., 1996, "Identification of scavenger receptor SR-B1 as high density lipoprotein receptor", Science. 271 (5248):518-20.

Ahrens, et al., 1967, "A direct method for preparing pyridoxal and 4-pyridoxic acid (1)", J. Heterocycl. Chem. 4:625-26.

Akdim et al., "Efficacy and Safety of Mipomersen, an Antisense Inhibitor of Apolipoprotein B, in Hypercholesterolemic Subjects Receiving Stable Statin Therapy," J. Am. Coll. Cardiol., vol. 55, Apr. 13, 2010, pp. 1611-1618.

(Continued)

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(57) **ABSTRACT**

Disclosed herein are compositions comprising fixed doses of ETC-1002 and Ezetimibe. Also disclosed herein are methods for using fixed doses of ETC-1002 and Ezetimibe. Uses include methods of treating cardiovascular disease or reducing the risk of cardiovascular disease in a subject. Uses also include methods of treating hypercholesterolemia in a subject.

8 Claims, 3 Drawing Sheets