US009409870B2

(12) **United States Patent**
Armani et al.

(10) **Patent No.: US 9,409,870 B2**
(45) **Date of Patent: Aug. 9, 2016**

(54) **COMPOUNDS**

(71) Applicant: **CHIESI FARMACEUTICI S.p.A.**, Parma (IT)

(72) Inventors: **Elisabetta Armani**, Parma (IT); **Carmelida Capaldi**, Parma (IT); **Jonathan Mark Sutton**, Harlow (GB); **Robert Andrew Heald**, Harlow (GB)

(73) Assignee: **CHIESI FARMACEUTICI S.p.A.**, Parma (IT)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/953,183**

(22) Filed: **Nov. 27, 2015**

(65) **Prior Publication Data**

US 2016/0168101 A1 Jun. 16, 2016

(30) **Foreign Application Priority Data**

Dec. 15, 2014 (EP) 14198044

(51) **Int. Cl.**

A61K 31/513	(2006.01)
C07D 233/70	(2006.01)
C07D 403/04	(2006.01)
C07D 405/14	(2006.01)
C07D 403/14	(2006.01)
C07C 309/29	(2006.01)
C07C 53/06	(2006.01)
C07D 401/14	(2006.01)

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

CPC ***C07D 233/70*** (2013.01); ***C07C 53/06*** (2013.01); ***C07C 309/29*** (2013.01); ***C07D 401/14*** (2013.01); ***C07D 403/04*** (2013.01); ***C07D 403/14*** (2013.01); ***C07D 405/14*** (2013.01)

(58) **Field of Classification Search**

USPC 514/183, 248, 359, 381

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2006/0100204	A1	5/2006	Cogan et al.
2014/0018345	A1	1/2014	Capaldi et al.

FOREIGN PATENT DOCUMENTS

EP	2 740 728	6/2014
WO	2007/129962	11/2007

OTHER PUBLICATIONS

Hall; Acta Crystallographica Section E: Structure Reports Online (2013), 69(7), o1102-o1103.*

Extended European Search Report in Application No. 14198044.1 issued Mar. 18, 2015.

* cited by examiner

Primary Examiner — Pancham Bakshi

(74) *Attorney, Agent, or Firm* — Oblon, McClelland, Maier & Neustadt, L.L.P.

(57) **ABSTRACT**

Compounds of formula (I) described herein are imidazolone derivatives having human neutrophil elastase (HNE) inhibitory properties and are useful for the treatment of diseases and conditions in which HNE is implicated.

12 Claims, No Drawings