PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
C07D 401/12, 405/14, 401/14, 409/12, A61K 31/445, 31/50, 31/495

A1

(11) International Publication Number: **WO 00/00488**

(43) International Publication Date: 6 January 2000 (06.01.00)

(21) International Application Number: PCT/US99/12821

(22) International Filing Date: 28 June 1999 (28.06.99)

(30) Priority Data:
09/107,983 30 June 1998 (30.06.98) US

(63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Application
US 09/107,983 (CIP)
Filed on 30 June 1998 (30.06.98)

(71) Applicant *(for all designated States except US)*: SCHERING CORPORATION [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US).

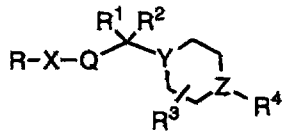
(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: KOZLOWSKI, Joseph, A. [US/US]; P.O. Box 7391, Princeton, NJ 08543 (US). MCCOMBIE, Stuart, W. [GB/US]; 28 Hanford Place, Caldwell, NJ 07006 (US). TAGAT, Jayaram, R. [US/US]; 133 Boynton Court, Westfield, NJ 07090 (US). VICE, Susan, F. [US/US]; 1144 Sawmill Road, Mountainside, NJ 07092 (US).

(74) Agents: MAGATTI, Anita, W. et al.; Schering–Plough Corporation, Patent Dept., K–6–1 1990, 2000 Galloping Hill Road, Kenilworth, NJ 07033–0530 (US).

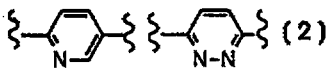
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GD, GE, HR, HU, ID, IL, IN, IS, JP, KG, KR, KZ, LC, LK, LR, LT, LU, LV, MD, MG, MK, MN, MX, NO, NZ, PL, PT, RO, RU, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, US, UZ, VN, YU, ZA, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.
With amended claims.

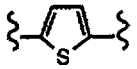
(54) Title: MUSCARINIC ANTAGONISTS



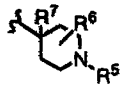
(I)



(2)



(3)



(4)

(57) Abstract

Heterocyclic derivatives of di–N–substituted piperazine or 1,4 di–substituted piperidine compounds in accordance with formula (I) (including all isomers, salts and solvates), wherein one of Y and Z is –N– and the other is –N– or –CH–; X is –O–, –S–, –SO–, $-SO_2-$ or $-CH_2-$; Q is (1), (2), (3); R is alkyl, cycloalkyl, optionally substituted aryl or heteroaryl; R^1, R^2 and R^3 are H or alkyl; R^4 is alkyl, cyclolalkyl or (4); R^5 is H, alkyl, –C(O)alkyl, arylcarbonyl, $-SO_2$alkyl, aryl–sulfonyl–C(O)Oalkyl, aryloxycarbonyl, –C(O)NH–alkyl or aryl–aminocarbonyl, wherein the aryl portion is optionally substituted; R^6 is H or alkyl; and R^7 is H, alkyl, hydroxyalkyl or alkoxyalkyl; are muscarinic antagonists useful for treating cognitive disorders such as Alzheimer's disease. Pharmaceutical compositions and methods of treatment are also disclosed.