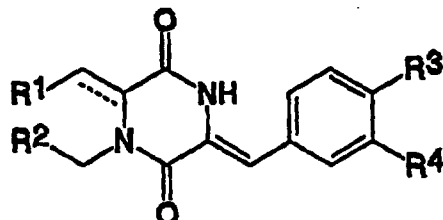


ABSTRACTPHARMACEUTICAL COMPOUNDS

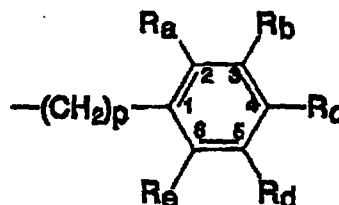
5 A piperazinedione derivative of the formula (I):



(I)

10 wherein

R¹ is (i) a group



15

wherein p is 0 or 2;

each of Ra to Re, which may be the same or different, is independently selected from hydrogen, C₁-C₆ alkyl

unsubstituted or substituted by one or more halogen atoms,

20 C₁-C₆ alkoxy, C₁-C₆ alkylthio, halogen, hydroxy, nitro,

optionally substituted phenyl, cyano, -CH₂OH, -CH₂COOH,

-CO₂R¹¹, -NHCOR¹¹, -NHCO₂R¹¹, -SO₂R¹¹, -CON(R¹¹R¹²), -SOR¹¹,

-SO₂N(R¹¹R¹²), -N(R¹¹R¹²), -O(CH₂)_nN(R¹¹R¹²), -O(CH₂)_nCO₂R¹¹,

-OCOR¹¹, -CH₂OCOR¹¹, -CH₂NHCOOR¹¹, -CH₂SR¹¹, -CH₂S(O)_nR¹¹ wherein

25 m is 1 or 2, -CH₂NHCO(CH₂)_nCO₂R¹¹, -N(R¹¹)COR¹¹, -NHCOCF₃,

-NHCO(CH₂)_nCO₂R¹¹, -NHCO(CH₂)_nOCOR¹¹ and -NHCO(CH₂)_nCO₂R¹¹;

wherein n is 0 or is an integer of from 1 to 6, each of R¹¹

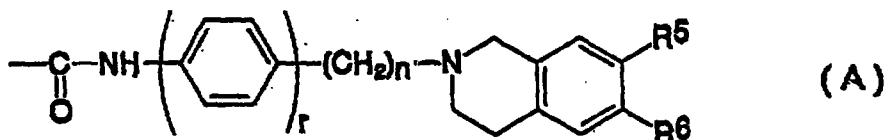


- 97 -

and R^{12} is independently H or C_1-C_6 alkyl and R^{13} is C_1-C_6 alkyl; or any of R_a and R_b , R_b and R_c , R_c and R_d or R_d and R_e together form a methylenedioxy group, or form together with the carbon atoms to which they are attached a benzene ring which is optionally substituted; or

(ii) a 5- or 6-membered heterocyclic ring containing at least one heteroatom selected from O, N and S, which group may be fused to a benzene ring;

R^2 is H, C_1-C_6 alkyl optionally substituted by a group $-N(R^{11}R^{12})$ as defined above, C_1-C_6 cycloalkyl, C_2-C_6 alkenyl, $-COOR^{11}$ wherein R^{11} is as defined above or a phenyl ring as defined under (i) above, but is other than H when R^1 is unsubstituted phenyl; and one of R^3 and R^4 is hydrogen and the other is a group of formula (A):



wherein n is an integer of 1 to 4, r is 0 or 1 and R^5 and R^6 , which may be the same or different, are each H or C_1-C_6 alkoxy, or R^5 and R^6 together form a methylenedioxy group; --- is a double bond or, when R^1 is as defined under (i) above, is a double bond or a single bond; and pharmaceutically acceptable salts thereof have activity as modulators of multi-drug resistance.

This Sheet Has Been Replaced

