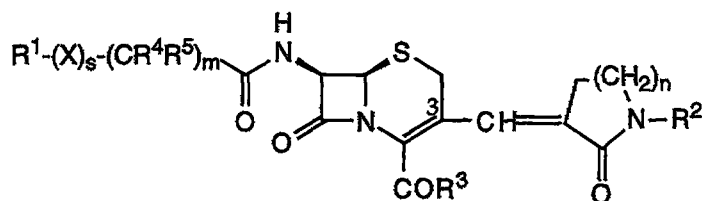


Abstract

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The present invention relates to cephalosporin derivatives of the general formula



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where

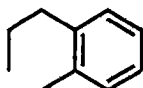
- 10 R^1 is halogen, lower alkyl, phenyl, benzyl, styryl, naphthyl or heterocyclyl; the lower alkyl, phenyl, benzyl, styryl, naphthyl and heterocyclyl being optionally substituted by at least one of halogen, hydroxy, optionally substituted lower alkyl, optionally substituted lower alkoxy, optionally substituted phenyl, amino, lower alkylamino, di-lower alkylamino, carboxy, lower alkyl-carboxy, carbamoyl or lower alkylcarbamoyl;
- 15 R^4, R^5 independently are hydrogen, lower alkyl or phenyl;
- X is S, O, NH or CH_2 ;
- n is 0, 1 or 2;
- 20 m is 0 or 1;
- s is 0 or 1;
- R^2 is hydrogen, hydroxy, $-CH_2-CONHR^6$, lower alkyl- Q_r , cycloalkyl- Q_r , lower alkoxy, lower alkenyl, cycloalkenyl- Q_r , lower alkynyl, aralkyl- Q_r , aryl- Q_r , aryloxy, aralkoxy, a
- 25 heterocyclic ring or a heterocyclyl- Q_r , the lower alkyl, cycloalkyl, lower alkoxy, lower alkenyl, cycloalkenyl, lower alkynyl, aralkyl, aryl, aryloxy, aralkoxy and the heterocyclic ring may be substituted with at least one group selected from carboxy, amino, nitro, cyano, $-SO_2NHR^6$, optionally fluoro substituted
- 30 lower alkyl, lower alkoxy, hydroxy, halogen, $-CONR^6R^7$, $-CH_2CONR^6R^7$, $-N(R^7)COOR^8$, R^7CO- , R^7OCO- , R^7COO- , $-C(R^7R^9)CO_2R^8$, $-C(R^7R^9)CONR^7R^{10}$, wherein R^6 is hydrogen, lower alkyl, cycloalkyl or aryl;



R^7 and R^9 are independently hydrogen or lower alkyl;
 R^8 is hydrogen, lower alkyl, lower alkenyl or a carboxylic acid
protecting group; and
 R^{10} is hydrogen, ω -hydroxy-alkyl, phenyl, naphthyl or
heterocyclyl, the phenyl, naphthyl or heterocyclyl being
unsubstituted or substituted with at least one of the groups of
optionally protected hydroxy, halogen, optionally substituted
lower alkyl or ω -hydroxyalkyl, optionally substituted lower
alkoxy and/or cyano, or R^7 and R^{10} form together group of

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formula

Q is $-CHR-$, $-CO-$ or $-SO_2-$;

r is 0 or 1;

R is hydrogen or lower alkyl; and

R^3 is hydroxy, $-O^-$, lower-alkoxy, or $-OM$ and M represents an
alkali metal;

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as well as readily hydrolyzable esters thereof, pharmaceutically acceptable
salts of said compounds and hydrates of the compounds of formula I and of
their esters and salts, as well as the preparation of such compounds, their
use for the treatment of infectious diseases and pharmaceutical
preparations containing such compounds.

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