

## Bisphosphonates (Yissum)

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Bisphosphonates, pharmaceutical compositions, and process for the treatment of irregularities in calcium metabolism

### Abstract

Novel bisphosphonates comprise compounds of the formula (I) ##STR1## wherein m and l are independently 1 or 2; R.sub.1 represents hydrogen, a lower alkyl group, or an alkali metal cation; R.sub.2 represents hydrogen, a lower alkyl group or an alkali metal cation; Y represents .dbd.0 or .dbd.N--OH, or --OH; and X represents --(CH.sub.2).sub.n --, a branched alkylene group, or a branched or straight alkenylene or alkynylene chain optionally substituted by one or more oxygen or nitrogen atoms, wherein n is an integer from 3 to 24; with the provision that when l.dbd.m.dbd.1, Y is .dbd.0, and R.sub.1 and R.sub.2 denote a lower alkyl group, n represents an integer from 9 to 20; and with the provision that when l.dbd.m.dbd.2, Y is --OH and R.sub.1 and R.sub.2 are methyl groups, n represents an integer from 9-24; and with the further provision that when l.dbd.m.dbd.2, Y is --OH and R.sub.1 and R.sub.2 are hydrogen, n represents 3, 5 or an integer from 7 to 24; or X is wherein p and p' are independently integers from 1 to 5 and q is an integer from 1 to 6; or X is wherein t and t' are independently integers from 1 to 6 and s is an integer from 2 to 12; or X is wherein B represents a branched group or straight alkylene, or an alkenylene or alkynylene chain optionally substituted by one or more oxygen or nitrogen atoms, and A represents an aromatic group such as phenylene, naphthalenediyl, thiophenediyl or furandiyl.

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