高等学校化学学报 2008 , 29 (2): 314—318 ISSN: 0251-0790 CN: 22-1131/O6

研究论文

环腺苷二磷酸核糖类似物的合成、表征及性质

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收稿日期 2007-6-29 修回日期 网络版发布日期 2008-2-27 接受日期

摘要 通过次黄嘌呤N^1-位取代及分子内环合等反应, 合成了由带芳基支链的含氮链替代天然北区核糖结构的环腺苷二磷酸核糖(cADPR)类似物cIDPRN. 该化合物与Jurkat T淋巴细胞在37 ℃下孵育18 h后, 经毛细管电泳分析, 结果表明该化合物具有良好的稳定性. 荧光分光光度计测定, 结果表明, 在有钙离子和无钙离子环境下, 该化合物胞外给药后均能引起浓度依赖性的钙离子释放. 由以上结果确定该化合物为具有膜透性的促细胞内钙释放激动剂.

关键词 核苷酸 cADPR类似物 钙激动剂 稳定性

分类号 0629.74

Chemical Synthesis, Characterization and Biological Properties of a Novel Cyclic ADP-Ribose Analogue

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Abstract For the investigation of the structure-activity relationship of the analogues of cyclic ADP-ribose (cADPR), a novel cyclic IDP-ribose analogue, cIDPRN, in which the northern ribose was replaced by *N*-carbobenzyloxy-alkylimine bridge was designed and synthesized. The enzymatic stability of cIDPRN was evaluated by the incubation with Jurkat T-lymphocytes for 0, 2 and 18 h. The result analyzed by capillary electrophoresis indicated that cIDPRN antagonized the hydrolysis, whereas cADPR was easily hydrolyzed. The Ca^{2+} signal release behavior was investigated in intact Jurkat T-lymphocytes by spectrofluorometer. It showed that cIDPRN induced calcium release either in extracellular Ca^{2+}-containing or Ca^{2+}-free condition. The result indicated that cIDPRN was a mild membrane-permeant agonist of cADPR/RyR signaling system. This study provided further information for understanding the effect of structure of northern ribose moiety of cIDPR on the calcium motivation activity.

Key words Nucleotide Analogues of cADPR Calcium agonist Stability

DOI:

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