Turnover of mu-opioid receptors in neuroblastoma cells.

Afify EA.

Department of Pharmacology, Faculty of Pharmacy, University of Alexandria, Egypt. afify001@hotmail.com

This study investigated the turnover of mu-opioid receptors (MOR) in neuroblastoma (N2A) cells under basal and agonist-stimulated opioid receptor down-regulation. Cells were labeled with [35S]methionine for 24 h and MOR degradation was quantified by immunoprecipitation using monoclonal anti (MOR) antibody followed by sodium dodecyl sulfate-polyacrylamide gel electrophoresis autoradiography. Treatment of N2A cells with the selective mu-opioid ligand (DAMGO) increased the rate of MOR degradation. The radiolabeled immunoprecipitable receptor was lost from the cells with a half-life (t(1/2)) of 12 and 7 h in the absence and presence of DAMGO, respectively. On the other hand, the protein synthesis inhibitor cycloheximide (10 microg/ml) produced a decrease in the rate of receptor degradation, t(1/2)=22 h indicated that the rate of MOR turnover was attenuated almost 2-fold following the inhibition of protein synthesis. Furthermore, when N2A cells were exposed to a combination of DAMGO and cycloheximide, the t(1/2) was 9.7 h. These data provided the first evidence that MOR is down-regulated during agonist stimulation and that the turnover rate of MOR is sum of both accelerated receptor degradation and decreased receptor biosynthesis.

PMID: 12393267 [PubMed - indexed for MEDLINE]