FEBS Letter **459**, 123-127 (1999)

Biosynthesis and turnover of anandamide and other N-acylethanolamines in peritoneal macrophages

Toyoyasu Kuwae (桑江 豊保), Yasuo Shiota (塩田 泰生),
Patricia C. Schmid, Randy Krebsbach, Harald H.O. Schmid

Polyunsaturated N-acylethanolamines (NAEs), including anandamide (20:4n-6 NAE), elicit a variety of biological effects through cannabinoid receptors, whereas saturated and monounsaturated NAEs are inactive. Arachidonic acid mobilization induced by treatment of intact mouse peritoneal macrophages with Ca^{2+} ionophore A23187 had no effect on the production of NAE or its precursor N-acylphosphatidylethanolamine (N-acyl PE). Addition of exogenous ethanolamine resulted in enhanced NAE synthesis by its N-acylation with endogenous fatty acids, but this pathway was not selective for arachidonic acid. Incorporation of ^{18}O from $H_2{}^{18}O$-containing media into the amide carbonyls of both NAE and N-acyl PE demonstrated a rapid, constitutive turnover of both lipids.