

Pituitary adenylate cyclase activating polypeptide (PACAP) is an important signaling molecule in many parts of the central and peripheral nervous system for neurotransmission, cell growth, differentiation, and survival. PACAP can bind to three G protein coupled-receptor subtypes; further the PACAP-selective PAC1 receptor can be expressed as different isoforms resulting in different downstream signaling events. Examining the different mechanisms of action of the PAC1 receptor isoforms may help illuminate its endogenous functions. For these studies, our lab uses HEK293 cells stably transfected with either the PAC1-Null or the PAC1-Hop1 PACAP receptor isoforms which vary in the type of cassette inserts into the third cytoplasmic loop of the G protein coupled receptors. By treating the cells with PACAP or various analogs/drugs before running Western blot experiments or immunohistochemical (IHC) experiments we aim to define differences in the temporal or magnitude of the PACAP-induced increases in ERK activation. The studies are ongoing but preliminary work has suggest that there may be differences in PAC1 receptor-mediated ERK responses depending on the nature of the ligand.