

In vivo studies of cyclic AMP phosphodiesterase activity in microinjected amphibian oocytes

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Using the microinjection technique it has been possible to measure the hydrolysis of (³H) cAMP injected into *Xenopus laevis* oocytes. A very active cAMP phosphodiesterase activity hydrolyzes its substrate to 5'AMP at a rate of 20 pmoles per minute per oocyte. An apparent K_m of 5×10^{-4} M can be estimated for the in vivo reaction. Endogenous levels of cAMP range from 2 to 6×10^{-6} M in full grown oocytes. Germinal vesicle (nuclear) concentrations are about 10 fold higher. Coinjected cGMP does not inhibit the hydrolysis of cAMP whereas 5×10^{-4} M theophylline inhibits 40%. Slow hydrolysis of microinjected cGMP was measurable at very low concentrations (10^{-6} M) but was significant at higher levels. The endogenous level of cGMP in full grown oocytes is below 10^{-7} M.