Copolymers of glutamic acid and tyrosine are potent inhibitors of oocyte casein kinase II

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Polypeptides rich in glutamic acid are strong inhibitors purified from isolated nuclei of Xenopus laevis oocytes of casein kinase II. The presence of tyrosine in these peptides greatly enhances their inhibitory capacity. Using casein as a substrate, copolyglu:tyr (4:1) has an I50 value of 20 nM, 250 fold lower than that of polyglutamic acid which is 5 ?M. A similar large difference is observed when a synthetic peptide is used as substrate. The inhibition of copolyglu:tyr is competitive with casein and can be completely reversed by high ionic strength. The relative inhibitory capacity of the polypeptides tested, in descending order, is copolyglu:tyr (4:1) > copolyglu:tyr (1:1) > polyglu > copolyglu:phe (4:1) > copolyglu:ala (> copolyglu:leu (4:1). The high affinity for tyrosine-containing acid peptides is shared by rat liver and yeast casein kinase II so that it seems to be a general property of these enzymes. © 1990.