

Nucleic acids can regulate the activity of casein kinase II

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Casein kinase II purified from nuclei of *Xenopus laevis* oocytes is inhibited by several specific nucleic acids. This kinase, the main phosphorylating activity of the oocyte nucleus, is markedly inhibited by poly U at 10 μ g/ml, and this polymer is a competitive inhibitor of the phosphorylation of the substrate casein (K_i 80 nM). M13 phage ssDNA and unfractionated yeast tRNA also inhibit between 50 and 200 μ g/ml. Poly C, poly A, poly AG, dsDNA and *Escherichia coli* rRNA do not alter activity significantly at similar concentrations. Inhibitions are reversed by RNase (poly U, tRNA) or S1 nuclease (ssDNA). Oocyte casein kinase I or rabbit cAMP-dependent protein kinase are not inhibited by poly U at 200 μ g/ml. The sensitivity of the casein kinase II to these inhibitors suggests a regulatory role for nucleic acids in nuclear phosphorylation reactions. © 1989.