Effect of metal ions on the activity of cascein kinase II from Xenopus laevis

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CaSein kinase II purified from the nuclei of Xenopus laevis oocytes as well as the recombinant ? and ? subunits of the X. laevis CKII, produced in E. coli from the cloned cDNA genes, were tested with different divalent metal ions. The enzyme from both sources was active with either Mg2+, Mn2+, or Co2+. Optimal concentrations were 7-10 mM for Mg2+, 0.5-0.7 mM for Mn2+ and 1-2 mM for Co2+. In the presence of Mn2+ or Co2+ the enzyme used GTP more efficiently than ATP as a phosphate donor while the reverse was true in the presence ofMg2+. The apparent Km values for both nucleotide triphosphates were greatly decreased in the presence of Mn2+ as compared with Mg2+. Addition of Zn2+ (above 150 ?M) to an assay containing the optimal Mg2+ ion concentration caused strong inhibition of both holoenzyme and ? subunit. Inhibition of the holoenzyme by 400 ?M Ni2+ could be reversed by high concentrations of Mg2+ but no reversal of this inhibition was observed with the ? subunit. © 1993.