

# Activity of Recombinant $\alpha$ and $\beta$ Subunits of Casein Kinase II from *Xenopus laevis*

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Casein kinase II (CKII) is a ubiquitous protein kinase, found predominantly in cell nuclei, which has two subunits in a tetrameric  $\alpha_2\beta_2$  or  $\beta_2\alpha_2$  conformation. The catalytic center is present in the  $\alpha$  subunit which is active by itself while  $\beta$  is a regulatory subunit that can greatly enhance the activity of  $\alpha$ . The cDNA genes of *Xenopus laevis* coding for the  $\alpha$  and  $\beta$  subunits of CKII have been expressed in *Escherichia coli* and extensively purified. The recombinant subunits reconstitute a fully active holoenzyme when incubated in stoichiometric amounts. Mutations that change serines in positions 2 and 3 of the  $\alpha$  subunit for glycines completely eliminate the autophosphorylation site present in this subunit but do not significantly affect the capacity of  $\alpha$  to activate  $\beta$ . A fusion protein composed of glutathione transferase linked to the *X. laevis* CKII  $\alpha$  subunit can also activate  $\beta$ . This fusion protein binds to glutathione-agarose beads and can mediate the binding of the  $\beta$  subunit to this matrix.