An inactive mutant of the ? subunit of protein kinuse CK2 that traps the regulatory CK2? subunit

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Protein kinase CK2 (casein kinase 2) is a ubiquitous Ser/Thr protein kinase involved in cell proliferation. Mutation of the ? subunit of the Xenopus laevis CK2 to change aspartic acid 156 to alanine (CK2?A156) resulted in an inactive enzyme. The CK2?A156 mutant, however, binds the regulatory subunit as measured by retention of ? on a nickel chelating column mediated by (His)6-tagged CK2?A156. Addition of CK2?A156 also caused ? to shift sedimentation in a sucrose gradient from a (?2) dimer (52 kDa) to an (?2?2) tetramer (130000 kDa). CK2?A156 can trap the ? subunit in an inactive complex reducing the stimulation of casein phosphorylation caused by addition of ? to wild-type ?. This competitive effect depends on the ratio of ?/?A156 and on the amount of ? available. Since ? inhibits the phosphorylation of calmodulin by CK2?, the addition of CK2?A156, in this case, increases calmodulin phosphorylation by the a and ? combination. These results suggest that CK2?A156 may be a useful dominant