Site-directed mutants of the ? subunit of protein kinase CK2 demonstrate the important role of Pro-58

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The following amino acids of the Xenopus laevis ? subunit of protein kinase CK2 (casein kinase 2) were changed to alanine: Pro-58 (?P?A); Asp-59 and Glu-60 and Glu-61 (?DEE?AAA); His-151-153 (?HHH?AAA). The last 37 amino acids of the carboxyl end were deleted (??179-215). Stimulation of CK2? catalytic subunit activity was measured with casein as substrate and the following relative activities were observed: ?P?A > ?DEE?AAA ? ?WT > ?HHH?AAA ? ??179-215. The ?DEE?AAA and ?P?A were similar to ?WT in reducing CK2? binding to DNA but ??179-215 was less active. The results indicate that both Pro-58 and the surrounding acidic cluster play roles in dampening the activation of CK2? and that the carboxyl end of ? is involved in the interaction with CK2?.