

Protein kinase casein kinase 2 holoenzyme produced ectopically in human cells can be exported to the external side of the cellular membrane

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Ectokinases can phosphorylate extracellular proteins and external domains of membrane proteins influencing cell adhesion, movement, and cellular interactions. An ectokinase with the properties of casein kinase 2 (CK2) has been previously described, but little is known about the structural characteristics that allow this enzyme to be exported from the cell. Transfection of human embryonic kidney-293 cells with cDNAs coding for the catalytic (CK2 α or CK2 β) and regulatory (CK2 γ) subunits with hemagglutinin tags allowed us to study the export of ectopically synthesized enzyme. When the catalytic (CK2 α or CK2 β) and the CK2 γ regulatory subunits are cotransfected, the tetrameric enzyme composed of both subunits (holoenzyme) is detected outside the cell. This observation has been confirmed by assaying protein kinase activity in immunoprecipitates obtained with antihemagglutinin antibody by using a CK2-specific peptide substrate and by Western blots as well as by immunofluorescence of nonpermea