Recent advances in the study of gamma subunit (FXYD2) effects on Na,K-ATPase from pig kidney medulla and PMCA from pig erythrocytes.

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Na,K-ATPase is a P-ATPase with 3 subunits (alpha, beta and gamma). The gamma subunit is a FXYD protein (FXYD2) isolated from Na,K-ATPase of pig kidney medulla by a chloroform-methanol (1:1) extraction. We have been demonstrated that FXYD2 cross-react with Ca2+-ATPases from pig erythrocytes (PMCA), suggesting that the anchoring site of gamma subunit could be conserved among P-ATPase family. The Ca2+ uptake from PMCA is doubled by a pretreatment of this enzyme with FXYD2, but surprisingly, pretreatment with PKA or PKC-phosphorylated form of FXYD2 caused a reduction of 50% of the Ca2+ uptake. We also show, with calorimetric assays (ITC) in the presence of sodium, that binding of gamma subunit on Na,K-ATPase is increased. In a medium with high potassium and no sodium this binding is slower.

Our results with PKA and PKC phosphorylation of gamma subunit suggest that it might be a specific regulatory event during catalytic cycle of Na,K-ATPase and other P-ATPases. The calorimetric experiment suggests that in the presence of sodium, the gamma subunit could interact more readily with alfa-subunit at its docking site.

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