IS IT POSSIBLE TO MEASURE ATP- ase ACTIVITY OF MULTIDRUG RESISTANCE-ASSOCIATED PROTEIN 1 (MRP1) IN ERYTHROCYTE MEMBRANE?

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Expression of membrane pump multidrug resistance associated-protein 1 (MRP1) confers drug resistance to cancer cells. Human erythrocytes constitute a convenient model to study transport activity of MRP1. Our aim was to establish a method allowing to measure ATPase activity of MRP1 in erythrocyte membranes. Erythrocyte membranes are complex model system and many proteins possessing ATPase activity are present there. Therefore we decided to employ a set of ATPase inhibitors (ouabain, sodium azide, EGTA) to block as much of non-MRP1 activity as possible. The results showed that the whole remaining ATPase activity of erythrocyte membranes was sensitive to orthovanadate and beryllium fluoride. MK-571, a specific MRP1 inhibitor, inhibited ATPase activity in the studied system, too. Also the profile of substances that inhibited or stimulated ATPase activity measured by us in erythrocyte ghosts was in general agreement with the one reported by other authors for ATPase activity of MRP1. Basal ATPase activity of erythrocyte membranes averaged 236 ± 6 nmole of inorganic phosphate released per mg of total protein per 60 minutes. The influence of flavonoids (apigenin, acacetin and morin) on ATPase activity of MRP1 was studied using the established method. Morin was found to stimulate this activity. We concluded that preliminary results were promising and the proposed method should be further improved.