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New Method for Membrane Vesicle Polarization

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Previously it was theoretically predicted that Gibbs-Donnan equilibrium can be used for creation stable and relatively high (about 70 mV) transmembrane potential with different charge in a system 'incubation medium – membrane vesicle'. For such calculations principles of particles balance, equality of electrochemical potentials and electrical neutrality were used. It was calculated that the higher difference between compartments 'vesicle' and 'medium' the higher potential is. Also potential meaning dependence on location of impermeable ion in diverse compartment was shown. Sufficient value of potential was obtained only when impermeable ion located in incubation medium.

Existence of potential was confirmed by changing in fluorescence level of potential-sensitive probe DiOC₆(3) in system KCl in vesicle and choline chloride in medium; and by spectrum shift in other potential-sensitive probe – oxonol VI in system KCl in vesicle and potassium citrate in medium. Obtained result allows further application of designed method for investigation of transmembrane protein properties which depend on potential.

The authors are grateful to prof. Kosterin S.O. and Shkrabak O.A. for the experimental results discussion.