

The membrane potential is one of the most important parameters of the living cell. It can be measured using carbocyanine fluorescent probes. In this thesis we examined parameters of several dyes of this family. For further experiments three of them were chosen – diOC₃(3), diIC₁(3) and diIC₂(5) as a supplement to diSC₃(3) and diSC₃(5), which represent standard probes used at biophysical department of Institut of Physics. We compared the rates of their accumulation in *S. cerevisiae* cells to determine if they were MDR pumps' substrates. The other goal of this work was to decide whether the results obtained using different probes are equivalent and to determine if the presence of a probe affects the spectral characteristics of another. For this purpose we have chosen diSC₃(3) and diSC₃(5). With those dyes we examined the influence of the acidification on membrane potential of the yeast *S. cerevisiae*. We showed that the information on depolarization obtained using both probes were matching very well.