

Electron and proton transport in chloroplasts: mathematical model and its comparison with experiment

Andrej Dubinsky, Keldysh Institute of Applied Mathematics, Moscow, Russia.

ABSTRACT

A mathematical model is constructed for electron flow and proton transport coupled with transmembrane transfer of protons in thylacoids of chloroplasts. It is assumed that the rate of electron transfer is controlled by the value of the intrathylacoid pH, and depends on mechanism of proton leakage through the thylacoid membrane and also on its geometric form. The set of equations for describing the processes of interest contains non-linear and so-called "diffusion" terms. If we take into account the Q-cycle around the b/f-complex we obtain the dependence of the electron flow on the proton efflux under the various conditions. The results agree with the experimental data.

References

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Contact Address: `dubinsky@mm.mpei.ac.ru`