

**Photosynthetic pigments in organisms and anisotropic systems *in vitro* - Barwniki fotosyntetyczne w organizmach i anizotropowych układach modelowych**

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The subjects of the article are results of the study of the orientation of photosynthetic pigments in thylakoid membrane and anisotropic systems *in vitro* by polarized spectroscopic methods. It examines the influence of the orientation on thermal deactivation in the pigments and energy transfer between them. It contains the evaluation of the configuration of the transition moments in the frame of the molecules and orientation distribution functions of chlorophylls oriented in the nematic liquid crystals, as well as the investigation of the orientation of pigments in chloroplasts, thylakoids and isolated pigment-protein complexes. PS2 and LHC, were embedded in the stretched polyvinyl alcohol film. It is shown that the deficiency of LHC may change the orientation of the rest complexes in the thylakoid membrane. The participation of *chl a* and *b* and  $\beta$ - carotene in thermal processes is proved by means of absorption and photoacoustic measurements: differently oriented pigments give the different contribution to thermal deactivation. There are observed the different yield of energy transfer between differently oriented pigments which indicates the existence of at least two pathways of energy transport in the anisotropic medium. This conclusion is supported by the polarized fluorescence decay measurements.