The study of fluorescent dye diffusion in murine brain tissue using confocal microscopy-based fluorescence recovery after photobleaching

Alexander Ilyich Dubrovskiy✉, Alexander Vladimirovich Dmitrenko, Ivan Fladlenovich Fedosov

Saratov State University, Scientific Medical Center, laboratory "Smart Sleep" (Saratov, Russia)
✉paskalkamal@mail.ru

Proper understanding of brain tissue characteristics and functions plays an important role in modern day biomedical and biophysical fields. Creating a mathematical model for interactions of liquids with brain intercellular space, blood vessel and lymphatic vessel networks can further the studies related to curing neuro-degenerative diseases, such as Alzheimer's disease, as well as other brain-related disorders.

This study describes a potential method for calculating brain tissue diffusion coefficient. We performed an imaging of fluorescein isothiocyanate-dextran fluorescence recovery after photobleaching utilizing a laser scanning confocal microscopy system. Implementing z-stack scanning alongside the imaging time-lapse partially offsets the micro-movements of the specimen during a potential *in vivo* experiment. The diffusion coefficient of the brain tissue can be calculated based on the changes in fluorescence intensity over time in a predetermined area of the sample.

Key words: fluorescent dye diffusion, fluorescent microscopy, photobleaching.

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