Молодые сотрудники ВШПФиКТ на конференции SPbOpen 2017

С 3го по 6е апреля в Санкт-Петербургском Национальном Исследовательском Академическом Университете прошла четвертая ежегодная международная школа-конференция, посвященная последним достижениям в области физики и технологий "Saint-Petersburg OPEN 2017". Традиционно в конференции принимают участие студенты и молодые ученые Политеха.

В 2017 году со стендовым докладом выступила магистрантка, сотрудница высшей школы прикладной физики и космических технологий, Савченко Екатерина, представившая работу на тему: "*Registration of fluorescence in biomolecular solutions using dynamic pin-photodiode*".

И магистр, инженер высшей школы прикладной физики и космических технологий, Баранов Максим с работой "*Methods of non-destructive testing in the study of self-organization processes in the protein films*".

Молодые ученые работают под руководством исполнительного директора ВШПФиКТ, Величко Елены Николаевны с третьего курса бакалавриата и уже добились значительных успехов. Их работы публикуются в известных мировых журналах, индексируемых в базах WoS и Scopus.

Желаем нашим ребятам дальнейших успехов в их научной карьере!


POLYTECH
Peter the Great St.Petersburg Polytechnic University
Methods of non-destructive testing in the study of self-organization processes in the protein films
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OBJECT OF STUDY
ALBUMIN PROTEIN
The main protein of blood plasma. Its amount in the blood plasma is about 55%. Possesses set of functions, starting with the withdrawal of exchange products, joining various chemical nature of substances and ending with the delivery of vitamins and trace elements. This the variety of albumin functions is due to its structure (conformation). With different external factors of conformation can be imputed, which leads to a partial or complete violation of protein functions.
Samples
Bovine serum albumin protein in aqueous solution with the addition of a magnetic fluid Fe3O4, a solution of albumin and NaCl, an aqueous solution of the albumin protein with the addition of acetic acid CH3COOH in various proportions, also analogous solutions of albumin with acetic acid with the addition of a magnetic fluid.
METHOD OF INVESTIGATION
The most accessible and simple method for studying the processes of self-organization is the method of visual study of the dynamics of the process of protein condensation and its phase transitions in nonequilibrium conditions: in an open protein-water system, far from thermodynamic equilibrium.
This method consists in evaporation of water from the colloidal protein-water system (dehydration) with further dynamic visualization of the process of condensation and self-organization of the protein in equilibrium and in nonequilibrium conditions in
The colloidal protein-water system of various nature
mbin) is placed on a solid wettable substrate (glass)
n open system at room temperature and
ure. The dynamics of the process is visualized
roscope and a sensitive CCD camera.
ERIMENTAL SETUP
SELF-ORGANAIZED STRUCTURES
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1 - aqueous solution of albumin, 2 - aqueous albumin on a single magnetic field, 3 - aqueous solution of albumin on a double magnetic field, 4 - aqueous protein solution with addition of 1 µl of acetic acid, 5 - an aqueous solution of the protein with the addition of 2 µl of acetic acid, 7 - the aqueous solution of the protein with the addition of 2 mcl of acetic acid, 8 - aqueous protein solution by adding 2 mcl of acetic acid per unit magnetic force 9 - aqueous protein solution is supplemented with 2 µl acetic acid on double magician itrom field, 10, 11, 12 - solution of albumin protein and NaCl.
Note. All studies were carried out on a magnetic field to magnetic fluid by adding a solution of 1 µl of FeSO4.
RESULTS
In the course of the work, films of albumin protein obtained by dehydration of various solutions of this protein were studied.
1. Experiments have shown that a constant magnetic field affects the structure formation of spiral nuclei: the higher the magnetic field, the smaller the characteristic rings around the central nuclei, and the smaller the size of the "cells".
2. It can be seen from the experimental data obtained that the increased acidity of the initial solution has a significant effect on the formation of protein structures, violating their "helicity".
3. As can be seen from the figures, the increased acidity of solutions when applying an external magnetic field does not have a significant effect on the structure formation of spiral nuclei. However, it is noticeable that the number of turns has increased.
4. It can be seen from the experimental data that physiological saline has an entirely different effect on the formation of protein films, in contrast to distilled water.
Experimental data show that this method of research is the basis for the study of self-organization processes. It allows one to visualize in the
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SAMARA UNIVERSITY
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In the course of studies have bee
investigated depending on the p
diffractive optical elements was
Introduction
One of the traditional methods
on the formation of micro-relie
with the deposition of thin metal
mask. Moreover, the patterns ar
laser writing system. Further, the
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