

## Effect of gamma irradiation of protein solution on the formation of film textures

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It is known that fractal textures are formed on the surface of films of biopolymers (DNA and protein). A study of the factors influencing the formation of these textures shows that one of the key factors is the presence of salts in the initial solution. Previously, it has been found that the formation of zigzag (Z) structures is also dependent on the conformation of the protein and is determined by the presence of chloride ions. For example, the structural change of protein caused by thermal denaturation results in the reduced specific density of Z-structures on the film's surface. It is known that gamma-irradiation of protein solutions alters the structure of protein molecules, which should have effect on the formation of the texture.

The aim of this work is to study the effect of gamma-irradiation of protein-salt solutions on the formation of textures on the protein film surface.

For the preparation of films, a solution of 20 mM of NaCl and 0.5 mg/ml of bovine serum albumin (BSA, DiaM, USA) was used. The structural changes of BSA were induced by gamma irradiation at a dose of 100 Gy, using Co<sup>60</sup> as the radiation source. The fluorescence spectra of BSA-salt solution were obtained in the wavelength range of 290-460 nm. The study of the textures revealed that the specific density of Z-structures on the film obtained from the irradiated solution is 30% less compared to the film obtained from the reference solution. The intensity maximum of the fluorescence spectrum of the irradiated solution decreased by 30% compared to that of the reference solution. This indicates a change of the protein structure by radiation. These data allow to conclude that the structural changes in BSA caused by gamma radiation prevent the formation of Z-structures on the film's surface. This may serve as the confirmation of the hypothesis that the

fractal ( $Z$ ) structures on the protein films' surface have a protein-salt nature.