

## **COMPLEX ANALYSIS OF THE BLOOD PLASMA POLARIZED IMAGES IN THE DIAGNOSTICS OF LACTEAL GLAND CANCER**

### **Introduction**

The incidence of lacteal gland cancer and mortality rate in the structure of cancer diseases in Ukraine and in most countries of the world in recent years occupies the first place. More than half of cases are diagnosed in Ukraine at the late stages of the disease. Undoubtedly that the development of specifying methods for diagnostics of early cancer changes as well as differentiation of early cancer and benign changes of the lacteal gland is of great importance.

### **Method**

There exists a number of markers of cancer changes in various organs. Most methods are based on the determination of concentration of biological substances (metabolites) that are created or increased in the blood in the presence of the tumor process. The suggested technique differs that new class of informative parameters is being studied, namely, changes of optical properties of the blood plasma during irradiation by polarized laser radiation are determined. Evaluation of optical changes is realized by complex analysis of laser images of blood plasma by statistics, correlation and fractal methods.

### **Results**

There had been carried out research of the blood plasma of 56 women with changes in the lacteal gland. The first group of 17 women with cancer of the lacteal gland of 1-2 stage, the second group of 19 women with benign tumors and focal hyperplasia, 20 - healthy. Verification of diagnoses was carried out by standard methods (physical, instrumental, X-ray and ultrasound mammography, morphological - cytological and histological examination).

There had been investigated parameters of the laser polarized images of blood plasma (azimuth, ellipticity and phase shift). Formation of polarized images was carried out on the research polarization installation in the traditional layout of the polarimeter elements. Complex, statistic, correlation and fractal analysis of each polarized image was carried out.

Results of experimental research are correspond to the proposed optical model of blood plasma as a two-component optical anisotropic polycrystalline protein network. Changes of optical properties of blood plasma during cancer processes in the lacteal gland are connected with to the change in the ratio of concentrations of blood plasma proteins.

### **Conclusion**

Ranges of statistic moments changes values, the correlation area, the dispersion and correlation moment at various pathologic processes of the lacteal gland (of the group B and C) and control group A have been determined experimentally.