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Fluorescent studies of lymphocytes subpopulations in colorectal cancer patients

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The novel fluorescent probe ABM (derivative of benzanthrone) was used to characterize lymphocyte membranes from colorectal cancer patients at stages II-IV and advanced cancer. The aim of the study was to evaluate the potential utility of measures of ABM fluorescence parameters as a standard tool in the analysis of organism immune status and for a clinical interpretation of lymphocytes functional activity in patients. ABM spectral parameters in lymphocytes reflect interrelated properties of the cells: 1) outer membrane physicochemical state, 2) membrane microviscosity, 3) proliferative activity, 4) lipid metabolism, and/or 5) phenotypical profile. Specific relatioship was obtained between ABM fluorescence in lymphocytes and characteristics of cells: Anisotropy index, binding constant, binding sites number etc. The lymphocyte distribution among the subsets also differed. Interestingly, the ABM fluorescence intensity in the cell suspension correlate with select immunological parameters (CD4+, CD8+, ratioCD4+/CD8+, level of immunoglobulines IgA, IgG, IgM etc). Decrease in the CD4+/CD8+ ratio mainly depend on an increase in the T-suppressor cells in patients without metastases, whereas it is due to a decrease in the T-helper cell in most patients with metastatic disease. Surgical treatment affects immunological parameters and apperead to elevate lymphocytes functional activity. Immunosuppression increased gradually with progress of cancer. In advanced cancer, in contrast to other groups, the absolute number of lymphocytes had direct (not inverse) correlation with ABM fluorescence intensity. The higher level of lymphocytes number, T-cell proliferative activity has a beneficial effect on overall survival. Significant note: Excellent agreement is obtained between changes in spectral characteristics and both clinical and pathological estimates of disease severity. Measures of ABM fluorescence intensity values in lymphocytes (as reflection of their functional activity) might be a useful tool in the evoluation of the immune status of patients in clinics including prognosis, prediction of therapeutic efficacy, treatment outcomes. The fluorescence-based method is less expensive, not very time-consuming, technically simple, 100 times more sensitive than standard ones.

Biography

Inta Kalnina is a biochemist and Dr. of Med. She graduated from Latvia State University in 1972. She is a fieldworker at Inst. Biol. and Medical Chemistry, Moscow, Russia; Inst. Biomedical Problems, Moscow, Russia. She is a Leading Researcher at Daugavpils University, Latvia. Her research interests include fluorescent based methods for development of structural and functional properties of membranes and plasma albumin in different pathologies, immune status of patients. She is a board member of J. India Research Publications and has 220 publications, participated in ~100 conferences and congresses and is the coauthor of 5 patents.

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