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Synthesis and characterization of modified starch hydrogels for photodynamic treatment of cancer

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The objective of the present study was to develop carboxymethyl starch (CMS) and dextran sulfate (DS) hydrogels that are able to efficiently encapsulate 5, 10, 15, 20-tetrakis (*meso*-hydroxyphenyl) porphyrin (mTHPP), a porphyrin-based PS agent. The study showed that the lifetime of the triplet state for porphyrin PS is significantly increase when encapsulate into hydrogel. In addition to the possible enhancement of 1O2 generation, other advantages to incorporating porphyrin-based PS agents into hydrogel include the ability to solubilize these generally hydrophobic agents, the small and uniform size of hydrogels, and potential for passive targeting of solid tumors via the enhanced permeation and retention effect decreasing systemic photosensitization. This novel type of carboxymethyl starch (CMS) hydrogel using dextran sulfate (DS) as a polyanionic polymer was developed to achieve complex coacervation for the incorporation and controlled release of an anti-angiogenesis hexapeptide, this was the first report describing the use of DS to formulate CMS based hydrogels.

Keywords: Modified starch, Dextran sulfate, Hydrogels, Photodynamic therapy, Cancer.

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The significance of fetal hemoglobin in malignant white blood cells and their differentiation

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As supported by accumulating evidences about spontaneous fetal hemoglobin (HbF) gene expression, in leukemia cell lines by our immunohistochemical detection of HbF in morphologically recognized white blood cells (WBC) of leukemia patients, as presented in our poster, we assume that HbF is a potential direct marker of malignant WBC. In leukemic cell lines models, HbF was upregulated at a very early developmental stage (CD34+, CD19-,CD2-), indicating that marking malignant WBC by HbF may have important clinical implications in the early detection of the disease and in monitoring response to therapy, where tumor cells are sparse. Another aspect, deserving investigation, is the involvement of HbF expression, in malignant WBC differentiation. HbF marked erythroid differentiation in the leukemic cell line K562 is considered as opposed to leukemic transformation, and drugs inducing such differentiation have been proposed as anti tumor agents. In order to evaluate the significance of HbF, as a direct marker in leukemia patients, we have recently elaborated a simple and efficient immunohistochemical protocol of staining those cells in bone marrow smears of 19 AML patients and in WBC concentrated peripheral blood smears of 19 CLL patients. In order to evaluate the clinical implication of that method, our purpose is to use it as reciprocated by biochemical measurements of HbF and in parallely comparing the results to the records of the patients.

Biography

Moshe Wolk is a Biologist-Microbiologist (Embryology; Serological and immunohistochemical cancer marking; Epidemiology of *E coli*). He attained his Ph.D. during 1975 from Hebrew University, Jerusalem, on differentiation and cell movement in the early chick embryo blastoderm. Has gained proficiency in the evaluation of fetal haemoglobin (HbF) as a serological and immunohistochemical marker in cancer, through three decades of research in Jerusalem (Tel-Hai Hospital) and in London (Department of Pathology - Barts and the London Medical school, and Department of Oncology ,Charing Cross Hospital). At Emeritus, is placed as Head of laboratory of pathogenic *E coli*, in Central Laboratories, Israel Ministry of Health.

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