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СОФИЯ

INTERACTION OF CELLS WITH MODIFIED POLYETHYLENGLYCOL SURFACES

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Keywords: Tissue Engineering, cell attachment, biomaterials, PEG

The use of a polymer as a biomaterial, as material touching the tissue, blood, proteins and other biological fluids inside or outside the human body requires solving serious problems biocompatibility. There are numerous opportunities for improving, of polymer surfaces, enabling the creation of uncharged, positively or negatively charged and contain various surface functional groups. The aim of this work is to find opportunities to improve bio-compatibility of silicone rubber which pre grafted acrylic acid with different density and plasma treated surface with subsequent grafting PEG with different density and chain length. The maximum of cell adhesion and survival received on a surface with an average density of PEG graft.

NITRIC OXIDE (NO[•])-SCAVENGING ACTIVITY OF THE METHANOLIC EXTRACTS OF IN VITRO CULTURES OF SOME MEDICINAL PLANTS CHARACTERISTIC FOR THE BALKAN FLORA

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Keywords: *Clinopodium vulgare*, *Artemisia alba*, *Hypericum* species, medicinal and aromatic plants biotechnology, NO[•] - scavenging activity

Here, we report a part of our continuing study on the biotechnological development of Balkan medicinal and aromatic plants some of which are poorly investigated. In this work, we obtained methanolic extracts from the aerial parts of *in vitro* cultured *Clinopodium vulgare*, *Hypericum tetrapterum*, two endemic representatives of the *Hypericum* genus – *H. rumeliacum* and *H. richeri* and *Artemisia alba* (aerial and root parts) and evaluated their NO[•] scavenging capacity. The extracts from the not well-studied *H. rumeliacum*, *H. richeri* and *H. tetrapterum* exhibited remarkably higher activity (0.18, 0.17 and 0.97 mg/ml, respectively)

compared to *C. vulgare* and *A. alba* (aerials and roots) ($SC_{50} = 3.45, 2.93$ and 2.62 mg/ml, respectively). Vitamin C was used as a reference compound, exhibiting $NO^{\cdot-}$ -scavenging activity of 0.26 mg/ml.

The presented results are indicative of the high therapeutic potential of the extracts derived from *in vitro* systems of the studied plants and are a good basis for further more detailed research.

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AMMONIUM VANADATE DECREASES VIABILITY AND PROLIFERATION OF CULTURED RETROVIRUS-TRANSFORMED CHICKEN HEPATOMA CELLS

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Keywords: ammonium vanadate, cell culture, chicken hepatoma, cytostatic/cytotoxic activity, myelocytomatosis virus.

Vanadium compounds have been reported to possess anti-neoplastic potential especially against chemically-induced liver, mammary, and colon carcinogenesis in rodents. According to the literature available, the anticancer activity of vanadium compounds in virus-transformed tumor cells has not been clarified yet. The aim of the study presented was to evaluate the effect of ammonium vanadate (NH_4VO_3) on viability and proliferation of cultured LSCC-SF-Mc29 cell line established from a transplantable chicken hepatoma, induced by the myelocytomatosis virus Mc29. The cells carry specific viral oncogene – v myc, and it is well known that *myc* (*c-myc*, *L-myc*, *N-myc*) proto oncogenes are involved in pathogenesis of > 80% of human malignancies. The investigations were performed by thiazolyl blue tetrazolium bromide (MTT) test, neutral red uptake cytotoxicity assay and double staining with acridine orange and propidium iodide. The results obtained revealed that applied at a concentration range of 0.1 – 20 μ g/ml for 24–72h NH_4VO_3 expresses significant cytotoxic and/or cytostatic effects that are time- and concentration dependent.

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EXOGENOUS TREATMENT BY PLANT GROWTH REGULATORS AFFECTS *ARTEMISIA ALBA* TERPENOID PROFILE BY ALTERING MORPHOGENESIS, PHYSIOLOGICAL STATUS AND ENDOGENOUS CYTOKININ LEVELS *IN VITRO*

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Keywords: *Artemisia alba* in vitro, endogenous cytokinins, Photosystem II, plant growth regulators, terpenoid profile

Modifications of plant growth regulators (PGRs) supplied to *Artemisia alba* in vitro cultures have been previously shown to affect plant morphogenesis and terpenoid profile of the essential oil of aerial parts. In continuation of this research we report here on the effects of PGRs on the terpenoid profile, structure of photosystem II in vitro as well as on the endogenous cytokinin (CK) levels of both above- and underground parts. The contents of CK bioactive forms (free bases and ribosides) were followed. It was revealed that the PGR-modified growth and development as well as the alterations of photosystem II structural organization were related to the CK levels of *Artemisia alba*. Thus, elevated monoterpenoid levels were associated with a higher peripheral antennae aggregation and elevation of *trans*-zeatin riboside, dihydrozeatin and dihydrozeatin riboside as well as *N*⁶-(2-isopentenyl)adenine in the aerals of the respective PGR treatments. These results imply of the role of exogenous factors such as PGR supplementation in affecting the terpenoid biogenesis in vitro by altering the levels of endogenous CKs and physiological status of the plant organism.