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Gram-negative bacterial phagelysates in anticancer therapy

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Application of bacterial preparations for anticancer immunomodulation is one of the promising ways of immunotherapy. Our experimental studies have shown high immunogenicity and less toxicity of E. *coli* and P. *aeruginosa* phagelysates than bacterial thermolysates. We were aimed to investigate antitumor immunomodulatory and adjuvant potential of Gram-negative bacterial phagelysates in cancer-bearing mice. Phage lysate of E. *coli-Shigella* specific Un bacteriophage was obtained by propagation of EcUn-phage in semisynthetic medium and tested for: Sterility, viable bacterial cell content (CFU/ml), phage particles (PFU/ml), optical density (600 nm), protein concentration (Bradford method), endotoxins (LAL tests) and safety. Treatment effects (E. *coli*-Un phage lysate vaccinations 0.25 ml/day; Cyclophosphan 800 mg/m2) in Ehrlich carcinoma-bearing C57BL/6J mice were estimated by: index of malignant growth (using semi-empirical mathematical model V=Vo{exp[(t-to)/T]-1}; cancer growth inhibition percent; CD3CD4, CD3CD8, CD25Foxp3, NK-cells, IL-12, IFN-γ, TGF-β (using FACS-Array Bioanalyzer, BD-FACSCalibur, USA, WST-8 Cell-Proliferation Assay-Kit; ELISA according to manufactures protocol, R&D-systems). It was observed that E. coli-Un phage lysate vaccinations are well tolerated in mice. Chemotherapy inhibited cancer growth, but no increase in lifespan was observed. Phagelysates significantly increased efficacy of chemotherapy. Cancer development was inhibited by 80–90%. In 13%-19% of mice with 250-450 mm3 cancers complete regression of tumors was detected. Increase in Tc-effectors and cytokines and decrease in T-regs indicate E. *coli*-Un phage lysate anticancer immunomodulatory and adjuvant potential. It can be concluded that bacterial phage lysates can be used as powerful adjuvant in anticancer therapy.

Biography

K Gambashidze has completed her PhD from Tbilisi State Medical University, Georgia. She is an Associate Professor and Head of the Scientific Unit of Pathophysiology department of TSMU, Chairman of TSMU Animal Welfare and Use Ethics Committee. She has published more than 90 papers in reputed journals and has been serving as an Editorial Board Member of SOP journals: *Open Journal of Biochemistry*; *Advances in Life Sciences and Health*; Editor-in-Chief of SOP "*Georgian Biomedical Journal*", member of European Society for Medical Oncology (ESMO), CRI Cancer Immunotherapy Consortium (CRI/CIC), Association of Oncologists of Georgia, Georgian Association of Allergology and Clinical Immunology.

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