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Biologically active compounds of plant origin and their synthetic derivatives: Prospective therapeutic agents

Plant extracts are still among the most attractive sources for drug development as they are believed to have no or minor side effects and thus, considered safe for use in humans. However, chemical constituents of many extracts represent serious risks to the human health. Thus, it is necessary to justify biological effects that are present in the vegetal products which are obtained from medicinal plants. For years, our research group is focused on chemical and pharmacological investigation of comfrey (*Symphytum asperum* and *S. caucasicum*) and bugloss (*Anchusa italica*) in order to determine the principal constituents responsible for their diverse curative properties. We succeeded in detecting and obtaining novel biopolymer that is Poly[3-(3,4-Dihydroxyphenyl) Glyceric Acid] (PDGA) from Boraginaceae family representatives *Symphytum asperum*, *S. caucasicum* and *Anchusa italica* and synthesis of its Monomer 3-(3,4-Dihydroxyphenyl) Glyceric Acid (MDGA). Pharmacological properties of PDGA and MDGA were studied both *in vitro* and *in vivo* experiments for antioxidant, wound healing, anticancer, leucopoietic properties. The obtained results revealed that, *in vitro* antioxidant activity and anti-complementary activity due to the inhibition of Xanthine oxidase complement convertase, respectively, abrogation of melanoma cells adhesion to tumor conditioned medium and VEGF-activated endothelial cells and also inhibition of prostate cancer cells growth. Consistent with *in vitro* results, *in vivo* study showed strong inhibition of 22Rv1 tumors growth without any toxicity, rapid burn and wound healing due to the shortening of the second phase of wound healing that is the inflammatory response and significant stimulation of leucopoiesis in mice drug-induced leucopenia. From the above observed effects, it suggests that PDGA and MDGA have high therapeutic potential.

Biography

Karen Mulkijanyan is the Head of the Department of Pharmacology at Tbilisi State Medical University Institute of Pharmacochemistry and Adviser on Technology Commercialization to afore-named Institute's Administration. He obtained his MS in Biochemistry in 1981 and PhD in Pharmacy in 2005. His research areas are pharmacology of anti-inflammatory, wound healing and microcirculatory drugs, analysis of SAR and prediction of bioactivity of natural, modified and synthesized compounds. He is the author and co-author of more than 90 papers in peer reviewed journals, about 30 presentations at international scientific meetings, and 2 patents.

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