

TITLE

Anti-cancer efficacy of novel phenolic polymer from *Symphytum asperum* and *S.caucasicum* (Boraginaceae) against androgen-dependent and -independent human prostate cancer cells

V. Barbakadze

Tbilisi State Medical University, Tbilisi

High-molecular (>1000 kDa) preparations from the crude polysaccharides of *Symphytum asperum* and *S.caucasicum* roots were isolated by ultrafiltration on membrane filters with cut-off values of 1000 kDa and the elucidation of their principal structural units was carried out. According to IR, ¹³C NMR, ¹H NMR, 2D heteronuclear ¹H/¹³C HSQC spectral data the main structural element of these preparations was found to be a regularly substituted polyoxyethylene, namely poly[oxy-1-carboxy-2-(3,4-dihydroxyphenyl)ethylene] or poly[3-(3,4-dihydroxyphenyl)glyceric acid] (PDPGA). Such phenolic biopolymer to our knowledge has not been known and has been identified for the first time. This compound represents a new class of natural polyethers with a residue of 3-(3,4-dihydroxyphenyl)glyceric acid as the repeating unit. PDPGA possesses anticomplementary, antioxidant and anti-inflammatory activities.

We examined the efficacy of PDPGA of *S.asperum* (PDGPA-SA) and *S.caucasicum* (PDGPA-SC) in androgen-dependent (LNCaP) and -independent (22Rv1 and PC3) human prostate cancer (PCA) cells. PDPGA-SA treatment (100 mcg/ml for 48h) decreases the live cell number by 65, 64 and 35% and increases the cell death by 16, 8 and 12 folds in LNCaP, 22Rv1 and PC3 cells, respectively. Similarly, PDPGA-SC treatment (100 mcg/ml for 48h) decreased the live cell number by 87, 25 and 33% and increased the cell death by 19, 10 and 9 folds in LNCaP, 22Rv1 and PC3 cells, respectively.

Overall, present study identified the strong efficacy of these novel phytochemicals against PCA cells, and suggested that their pre-clinical efficacy studies in PCA models are needed in future to move them forward for possible translational potential in PCA patients.

Biography

1978 and 1999 has completed his Ph.D and his D.Sci. at the ages of 33 and 54 years from Zelinsky Institute of Organic Chemistry, Moscow, Russia and Durmishidze Institute of Biochemistry and Biotechnology, Tbilisi, Georgia, respectively. 2006 up to date he is the head of laboratory of plant biopolymers at the Tbilisi State Medical University I.Kutateladze Institute of Pharmacochimistry. 1996 and 2002 he has been a visiting scientist at Utrecht University (faculty of pharmacy, department of pharmacognosy), The Netherlands, by Utrecht University Scholarship and NATO Scientific Program, respectively. He has published more than 50 papers in reputed journals.