

Title of the project: Antitumor activity of isoquinoline alkaloids

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Summary of 2017 results

Title of the presentation: Bersavine and its biological activity

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Bersavine is a new isoquinoline alkaloid, isolated alongside berbamine and berberine, from *Berberis vulgaris* L. also known as common barberry. Barberry is a shrub in the genus *Berberis*. Its fruits are edible and have been used to prepare jam, jelly and juice. Salishan elders have also used barberry to treat acne and native American Indians utilized it to treat scurvy. Some other folk medicines made use of barberry in the treatment of fever, gout, renal and biliary diseases, rheumatic symptoms or diarrhea. In the most recent years *Berberis vulgaris* L. became a source of new isoquinoline alkaloids with promising anticancer activity. At first we evaluated bersavine's antiproliferative effect on panel of 9 different cell lines (Jurkat - acute T cell leukemia, MOLT-4 - acute lymphoblastic leukemia, A549 - lung carcinoma, HT-29 - colorectal adenocarcinoma, PANC-1 - pancreas epithelioid carcinoma, A2780 - ovarian carcinoma, HeLa - cervix adenocarcinoma, MCF-7 - breast adenocarcinoma and SAOS-2 - osteosarcoma cell lines). All cells were exposed to a single 10 μ M dose of bersavine for 48 hours. Human cancer cell lines MOLT-4, Jurkat, HT-29, HeLa and MCF-7 appear to be the most sensitive to the antiproliferative effect of bersavine. Follow-up experiments on MOLT-4 and Jurkat cells revealed that bersavine reduced their cell viability and proliferation in a dose dependent manner within 24 h of treatment. Moreover, the reduction of cell viability was even more pronounced 48 h following the treatment. The decrease in cell viability was caused by the induction of apoptosis and activation of caspases 48 h after the application of bersavine. Furthermore, our experiments revealed significant accumulation of MOLT-4 cells in G1 phase of a cell cycle after 20 μ M concentration. Last but not least our test revealed that bersavine does not induce DNA strand breaks, since no significant DNA damage was found 24 following the treatment. So far our results show great potential for continuing research on bersavine.

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