Title of the project: Antitumor activity of isoquinoline alkaloids

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Co-investigators: M. Pospíšilová, R. Havelek, M. Řezáčová

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Summary of 2018 results

Title of the presentation: Final research report on project Antitumor activity of isoquinoline alkaloids

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Since the early stages of man, plants play an important role as medicine to humans and have made an enormous impact on the discovery of drugs, including anticancer agents. Although, plants have spurred great interest as source of anticancer agents during the past decades, the promise of combinational chemistry and modern synthetic technologies have overshadowed natural products research as source of new drugs. However, the plants are historically the core of medicines and they are still a major source of perspective new drug leads. Even if the plants represent a superb source of the most effective anticancer drugs such as vinca alkaloids, taxanes, podophyllotoxin derivatives and others, a large number of plant-derived compounds have been barely studied and still need to be investigated.
The objective of this project was to characterize antitumor activity of little-known isoquinoline alkaloids and their analogues. Compounds with cytotoxic effect against cancer cell lines were subjected to deeper in vitro testing with the intent to determine their mechanism of action. Hence, we studied their impact on cell cycle, replication, induction of single-strand and double-strand DNA breaks, including induction of apoptosis and we also investigate their ability to affect DNA-damage response intracellular signalling pathways. In this project, scoulerine, haemantamine, haemantidine, lycorine, chelidonine and homochelidonine were subjected to biological evaluations.
To date, three original research articles and one review article were published in peer-reviewed journals with impact factor. These works were financially supported by the Grant Agency of Charles University (Project No. 932616).

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