

## Assessment of pharmacokinetics and biological effects of lignin-derived polyphenolic compositions BP-C3 and BP-C2 in in vivo models

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Keywords: lignin, polyphenolic composition, BP-C3, BP-C2, pharmacokinetics, effects

doi: 10.36291/HIT.2019.panchenko.096

BP-Cx-1 is a water-soluble multicomponent composition of polyphenolic compounds derived from lignin-based enterosorbent - Polyphepan® treated in the alkaline medium at the elevated pressure and temperature with continuous supply of oxygen [1]. BP-Cx-1 is used as base for a number of compositions with different activities. BP-C3 is a formulation, which comprises BP-Cx-1 with iron complex, selenium, ascorbic acid and retinol. Long-term treatment with BP-C3 had anticarcinogenic and geroprotective activity in female SHR mice [2]. BP-C3 was found to reduce the toxic effect of 5-fluorouracil against hematopoiesis and intestinal epithelium which was evident by preserved organ/body ratios for the lymphopoietic organs, anemia reduction and intestinal crypt survival [3]. BP-C2 is a composition which comprises BP-Cx-1 with ammonium molybdate, developed as radioprotector/radiomitigator [4]. BP-C2 was tested in two total body gamma-irradiation models (CBA and C57BL/6 mice) and exhibited a radiomitigating effect in the midlethal range of radiation doses. BP-C2 improved animal survival, protected intestinal crypts and Lgr5+ stem cells and enhanced extramedullar hematopoiesis in the spleen. Neither BP-C2 nor BP-C3 administered to intact animals has effects on blood count or biochemistry, body weight or animal behavior. For pharmacokinetics, the labeled [3H]-BP-Cx-1 was administered intravenously or by gavage once to BALB/c mice. In case of i.v. administration the primary organs of accumulation were the lungs, liver, kidneys and spleen (50-5000 µg/g tissue). BP-Cx-1 has low oral absolute bioavailability, its concentration in animal organs is several orders of magnitude lower than when administered i.v. (2-18 µg/g tissue). The present study demonstrated the feasibility of using a lignin derived polyphenolic compositions to diminish the toxic effects of chemotherapy and radiation injury. Both studied compositions provide significant protection effect against intestinal injury caused by chemical (BP-C3) or radiation (BP-C2) exposure. The extensive therapeutic potential of lignin derived polyphenolic compositions is yet to be explored.

This work was supported by Russian Science Foundation (grant #16-15-00142) and by Russian Foundation for Basic Research (grant # 18-33-20147).

### References

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