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A novel antitumor protein from *Calloselasma rhodostoma* venom in Vietnam

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Introduction: There are over thirty thousand of snakebite victims annually in Vietnam (VN). Two venomous snake families cause the big medical problem. In this, Calloselasma rhodostoma (CR) is the most dangerous snake of viperidae. Therefore, since 2001, the scientific research collaboration between VN and University of Southern California (USC) has been established and approved by VN government. The aim of the 1st project was determined the technological process for purification of disintegrin from CR venom of VN (CRd.VN), looking for a new candidate drug of cancer treatment.

Method: The process of collection, lyophilization of CR venom from VN. Its protein concentration was determined by BCA assay. High Performance Liquid Chromatography (HPLC), SDS-PAGE, Mass spectrometry (MS) analysis and sequencing by tryptic digestion were used for purification of CRd.VN and determined its molecular weight (MW) and structure. Standard cell biological methods were employed to characterize CRd's abilities (*in vitro*) to inhibit platelet aggregation, adhesion, migration and invasion of tumor cells. The anti-cancer activities of CRd.VN in the breast cancer (BC) of mice model (in vivo) were tested.

Results: The peak No 7 of HPLC (CRd.VN) showed a single (MW≈10 kDa) band on SDS-PAGE gel. CRd.VN's MW was 7.33 kDa. Its molecular structure and the sequence were a monomer, containing 68 amino acids with RGD motif (position 49-51) and 6 disulfide bonds. The anticancer activities of CRd.VN were very strong and safe.

Conclusion: We have shown that CRd.VN is a possible anti-tumor agent with clinical potential. The next step for CRd.VN recombinant production, preliminary pharmacokinetics, and toxicological properties are opening before coming to a preclinical trial course.

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