Hypercoagulability and Cancer: Role of a Heparinoid from Pacific White Shrimp on Hemostasis and on Tumor Cells Proliferation.

Cavalcante, R.S.¹, Brito, A.S.², Azevedo, F.M.¹, Coelho, L.F.¹, Cruz, A.K.M.¹, Palhares, L.C.G.F¹, Bezerra, I.L.¹, Brito, R.M.M.¹, Luz, J.R.D.¹, Andrade, G.P.V.¹, Oliveira, F. W.¹, Chavante, S.F.¹

¹ Departamento de Bioquímica, UFRN, RN, Brasil.
² Departamento de Enfermagem, FACISA, UFRN, RN, Brasil.

INTRODUCTION: The occurrence of thromboembolic events in cancer patients is directly related to the decrease of survival time of these individuals. In this case, anticoagulant therapy has been indicated for these patients, once besides reducing the risk of thrombus formation, the heparin still have antitumor properties associated with their structure. However, due to the high potential hemorrhagic as well as the risk of thrombocytopenia induced by unfractionated heparins and the high cost of low molecular weight heparins, these anticancer effects are compromised. For this reason, heparin analogous compounds (heparinoid) previously identified in a variety species of marine invertebrates have been extensively investigated, mainly because of reduced side effects. Thus, this work has as objective assessed the potential antiproliferative of heparinoid gray shrimp, as well as their ability to maintain the hemostatic balance in prothrombotic conditions. METHODS: heparinoid was isolated from *Litopenaeus vannamei* by proteolysis and treatment with acetone and then purified by chromatography. The tumor cells proliferation has been evaluated by crystal violet assay and the effects on hemostasis evaluated by activation of tissue factor assay, coagulation (aPTT), anti-Xa activity, anti-thrombotic and hemorrhagic. RESULTS AND DISCUSSION: Compared to heparin, heparinoid was capable to reduce tumor cell proliferation approximately 50%. About the events of hemostasis results showed that this compound has a moderate anticoagulant effect and a low residual hemorrhagic effect besides being effective in reducing thrombus formation and inactivation of factor Xa. CONCLUSION: The results show the heparinoid as promising agent capable of helping in cancer treatment, since it may be effective not only in reducing tumor development but also preventing the complications of thrombotic events, which could provide a longer survival time to cancer patients.

Keywords: cancer, hemostasis, heparinoid, hypercoagulability.