Ácido bórico inibe a atividade do PSA in vitro

Inhibition of the enzymatic activity of prostate-specific antigen by boric acid and 3-nitrophenyl boronic acid

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Abstract

Background: Prostate specific antigen (PSA) is a well-established marker of prostate cancer, but it can also degrade extracellular matrix proteins such as fibronectin and could be involved in tumor progression and metastasis. In this study, we have addressed the use of boric acid and 3-nitrophenyl boronic acid (NPBA) as PSA inhibitors in vitro.

Methods: The inhibition of PSA by boric acid was studied by using specific fluorogenic substrates. Fibronectin, a biologically relevant substrate for PSA, was used as a substrate in a zymographic assay, and the degradation of fibronectin by PSA in the presence of boric acid and NPBA was followed by Western Blot.

Results: Low concentrations of boric acid partially inhibited the proteolytic activity of PSA toward a synthetic fluorogenic substrate. Also, by Western blot, we have found significant inhibition in the proteolysis of fibronectin by PSA in the presence of boric acid as well as NPBA. Results indicate that the boronated compounds used in this study can be used for the modulation of PSA activity.

Conclusion: PSA activity is inhibited in vitro by boric acid and NPBA. If degradation of fibronectin by PSA were, in fact, an important step in the

progression of prostate cancer, then borate-induced inhibition of PSA activity should help reduce the development and proliferation of prostate carcinomas.