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S-allylcysteine, a water-soluble garlic derivative, suppresses the growth of a human androgen-independent prostate cancer xenograft, CWR22R, under in vivo conditions.

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Abstract

OBJECTIVE: To evaluate the effect of S-allylcysteine (SAC) on CWR22R, a human androgen-independent (AI) prostate cancer xenograft, in nude mice. Despite extensive research worldwide there is no effective way to control the growth of prostate cancer, and we previously reported that SAC and S-allylmercaptocysteine (SAMC), two water-soluble derivatives of garlic, inhibit cancer cell invasion through restoration of E-cadherin expression in vitro.

MATERIALS AND METHODS: The effects of SAC on tumour cell proliferation markers such as Ki-67 and proliferating cell nuclear antigen, and apoptotic regulators including Bcl-2 and cleaved caspase-3, were assessed by immunohistochemical staining. The inhibitory effects of SAC on prostate cancer invasion was examined by immunoreactivity of E-cadherin and its binding proteins alpha, beta and gamma-catenins. The serum prostate-specific antigen (PSA) level at three different times (initiation, middle and end of treatment) and toxicity of SAC on several organs after treatment were assessed.

RESULTS: Treatment with SAC resulted in inhibition of the growth of CWR22R, with no detectable toxic effect on nude mice. The SAC-induced growth reduction was correlated with a concurrent reduction in serum PSA level and proliferation rate of xenografts, together with an inhibition of invasion through the restoration of E-cadherin and gamma-catenin expression. Furthermore, the apoptotic rate of SAC-treated tumours increased together with a decrease in Bcl-2 and increase in cleaved caspase-3.

CONCLUSION: These results suggest that this garlic-derived compound might be a potential therapeutic agent for suppressing AI prostate cancer.

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