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Inhibition of cell growth through inactivation of eukaryotic translation initiation factor 5A (eIF5A) by deoxyspergualin

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Deoxyspergualin, a synthetic derivative of spergualin produced by *Bacillus laterosporus*, and its analogues were first developed as anti-proliferative reagents and have been used as immunosuppressants. The mechanism of inhibition of cell growth by deoxyspergualin was studied using deoxyspergualin analogues showed that both the guanidinoheptanate amide and glyoxyspermidine moieties of deoxyspergualin were necessary to cause inhibition of cell growth. When deoxyspergualin was added to culture medium of mammary carcinoma FM3A cells, there was a strong inhibition of cell growth and formation of active eukaryotic translation initiation factor 5A (eIF5A) at the third day of culture. There were also a marked decrease in cellular putrescine content and a small decrease in spermidine content, and accumulation of decapped mRNA. The inhibitory effect of deoxyspergualin was not reversed by addition of spermidine. These results indicate that inhibition of active eIF5A formation is strongly involved in the inhibition of cell growth by deoxyspergualin.