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Antiviral Activity of Bacterial Extracellular Ribonuclease Against Single-, Double-Stranded RNA and DNA Containing Viruses in Cell Cultures

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Abstract

© 2016, Springer Science+Business Media New York.Binase, a small guanyl-preferring extracellular ribonuclease of Gram-positive non-pathogenic soil bacteria Bacillus pumilus. Binase is a well-known bacterial ribonuclease, and the most essential properties of the enzyme were characterized. Binase has demonstrated antiviral activity in various virus-infected animal models. Most experiments associated with binase treatment of virus-infected animals were performed using single stranded RNA viruses. It is still unclear, whether binase is able to inactivate the double stranded RNA virus. Moreover, the phenomenon of the antiviral activity of binase against the DNA containing virus in animal model is not explained. Here, we presented the experimental results reflecting binase effect towards eukaryotic cells infected with viruses containing different types of nucleic acids. The obtained data revealed the bacterial ribonuclease binase mode of action against single stranded RNA influenza A virus, double stranded RNA reovirus and DNA containing herpes virus to prove future application of new antiviral tool with a broad range of activity.

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Keywords

Antiviral agent, Binase, Herpes virus, Influenza A virus, Reovirus, Ribonuclease