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Antitumor macrophage response to bacillus pumilus ribonuclease (Binase)

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Abstract

© Copyright 2017 Anna Makeeva et al. Extracellular bacterial ribonucleases such as binase from Bacillus pumilus possess cytotoxic activity against tumor cells with a potential for clinical application. Moreover, they may induce activation of tumor-derived macrophages either into the M1-phenotype with well-documented functions in the regulation of the antitumor immune response or into M2-macrophages that may stimulate tumor growth, metastasis, and angiogenesis. In this study, binase or endogenous RNase1 (but not RNA or short oligonucleotides) stimulated the expression of activated NF-κB p65 subunit in macrophages. Since no changes in MyD88 and TRIF adaptor protein expression were observed, toll-like receptors may not be involved in RNase-related NF-κB pathway activation. In addition, short exposure (0.5 hr) to binase induced the release of cytokines such as IL-6, MCP-1, or TNF-α (but not IL-4 and IL-10), indicative for the polarization into antitumor M1-macrophages. Thus, we revealed increased expression of activated NF-κB p65 subunit in macrophages upon stimulation by binase and RNase1, but not RNA or short oligonucleotides.

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