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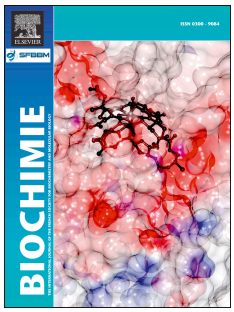

The antimicrobial peptide nisin Z induces selective toxicity and apoptotic cell death in cultured melanoma cells

Angélique Lewies, Johannes Frederik Wentzel, Hayley van Dyk, Lissinda Hester Du Plessis

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Abstract

Reprogramming of cellular metabolism is now considered one of the hallmarks of cancer. Most malignant cells
Reprogramming of cellular metabolism is now considered one of the hallmarks of cancer. Most malignant cells
present with altered energy metabolism which is associated with elevated reactive oxygen species (ROS) generation. This is also evident for melanoma, the leading cause of skin cancer related deaths. Altered mechanisms affecting mitochondrial bioenergetics pose attractive targets for novel anti-cancer therapies. Antimicrobial peptides have been shown to exhibit selective anti-cancer activities. In this study, the anti-melanoma potential of the antimicrobial peptide, nisin Z, was evaluated *in vitro*. Nisin Z was shown to induce selective toxicity in melanoma cells compared to non-malignant keratinocytes. Furthermore, nisin Z was shown to negatively affect the energy metabolism (glycolysis and mitochondrial respiration) of melanoma cells, increase reactive oxygen species generation and cause apoptosis. Results also indicate that nisin Z can decrease the invasion and proliferation of melanoma cells demonstrating its potential use against metastasis associated with melanoma. As nisin Z seems to place a considerable extra burden on the energy metabolism of melanoma cells, combination therapies with known anti-melanoma agents may be effective treatment options.

Keywords

Melanoma; Antimicrobial peptide nisin Z; Mitochondrial respiration; Glycolysis; Reactive oxygen species (ROS); Anti-cancer therapy