

Melatonin effects in normal and tumoral skeletal muscle cells: a preliminary study

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Melatonin (MEL), also chemically known as N-acetyl-5-methoxytryptamine, is a hormone found in animals, plants, and microbes. It exhibits strong antioxidant effects and thanks to its structure it is able to diffuse through all the biological membranes, also overcoming the blood-brain barrier and the placenta (Salucci et al., 2014). Numerous *in vitro* and *in vivo* studies have documented Mel ability to induce apoptosis in tumor cells while inhibiting it in the normal ones (Cristofanos et al, 2009; Lanoix et al., 2011).

In this study MEL activity has been investigated *in vitro* both in murine skeletal muscle (C2C12) and in alveolar rhabdomyosarcoma (RH30) cell lines by means of morpho-functional approaches. If MEL low concentrations are well tolerated by normal skeletal muscle cells, its effect appears completely different in tumor cells, where MEL can be considered a powerful apoptotic trigger. In RH30 cells, blebbing, chromatin condensation and margination, apoptotic bodies occur as well as necrotic cell death features. The latter appeared after prolonged exposure to MEL. In conclusion, the neuro-hormone shows a strong dose and time dependent pro-apoptotic activity and it could represent a potential tool in association with the current chemotherapeutic compounds to resolve alveolar rhabdomyosarcoma, the most common pediatric skeletal muscle tissue malignancy.

References

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Keywords

Melatonin, C2C12 and RH30 cells, anti-apoptotic and pro-apoptotic effect, morphology.