MMSL
Military Medical
Science Letters
Since 1925

Mil. Med. Sci. Lett. (Voj. Zdrav. Listy) 2022, 91 (supplementum 1)
ISSN 0372-7025 (Print)
ISSN 2571-113X (Online)

MEETING ABSTRACTS

DIFFERENCES IN THE BIOLOGICAL EFFECTS OF BACTERIAL AND SYNTETIC MELANIN

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Melanins are heterogeneous polymeric dark pigments colored in black with relatively diverse properties, functions and rather non-defined structure. Many of commercially available melanins used in scientific studies have been produced synthetically or isolated from natural sources (1, 2).

We studied two types of melanin, i.e. commercially available synthetic melanin (SM) and biotechnologically obtained bacterial melanin (BM) from *Bacillus thuringiensis*. The topical aim of our study was to estimate the biological effects of both melanins in the neuroblastoma SH-SY5Y cell line. After melanin treatment (0-200 μg/mL), cell viability, glutathione levels (3) and cell respiration were assessed.

Both melanins were structurally characterized in detail and BM was more hydrophilic. After melanin treatment of SH-SY5Y cells, we found that SM at similar dosage caused always larger cell impairment compared to BM. In addition, more severe toxic effect of SM was found in mitochondria. In general, we conclude that more hydrophilic BM induces lower cell impairment in comparison to SM. Although additional elucidation of the toxicity mechanism is needed, it seems that the difference in level of toxicity induced by melanins can be dependent on their water solubility. Our findings can be usable for neuroscientific studies estimating the potential use for study of neuroprotection or neuromodulation.

The financial support was received from the Ministry of Education, Youth and Sports of the Czech Republic via projects IT4Neuro(degeneration), Reg. No. CZ.02.1.01/0.0/0.0/18_069/0010054.

Keywords: Bacterial melanin; Synthetic melanin; Neurotoxicity; Neuroblastoma cells; Mitochondrial impairment

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