Melanoma is a rare and aggressive skin tumor; the survival of patients diagnosed late is fairly low. This high mortality rate is due to the characteristics of the cells that allow them to be resistant to radiotherapy and conventional chemotherapy. Melanin, the pigment responsible for skin, hair and eye color, seems to be involved in this resistance. The main function of melanin is to protect the cells against UV light by absorbing this radiation and ROS scavenging. But this pigment may also have a role as photosensitizer, because when it is irradiated with UV or visible light, the generation of ROS was detected. Furthermore, the melanogenesis stimulation on B16-F10 cells resulted in cell cycle arrest, induction of a quiescent state, change in the expression of several proteins and alterations on ADP/ATP ratio. The present study aimed to investigate the influence of melanogenesis stimulation by treatment with 0.4mM L-tyrosine and 10mM NH4Cl on mitochondrial function of B16-F10 melanoma cells. We analyzed respiration by high performance respirometry in the absence and presence of ETC inhibitors and uncouplers, and mitochondrial membrane potential (Δψm), through JC-1 fluorescent probe. Our results showed that the induction of melanin synthesis was able to reduce significantly the cell respiration after 48 hours of stimulation, without changes of mitochondrial membrane potential when compared to non-stimulated cells. We suggest that the stimulation of melanin synthesis might be promoting the inhibition of ETC by some intermediate compound from the synthesis of the pigment and this effect could contribute to explain the entrance in the quiescent state.

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Key words: cell respiration, melanoma, melanin.