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Potential application of beta-blockers on melanoma treatment: an *in vitro* study

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Abstract: Melanoma is the most invasive type of skin cancer, often curable when caught at early stages. However, for advanced stages, the efficiency of the few available treatments is limited. Considering that the number of cases of melanoma cancer is expected to increase in the next few years, there is an urgency to increase the efficiency of treatments. This study aimed to evaluate the potential application of beta-blockers, drugs in the treatment of heart diseases, in melanoma treatment. Thus, A375 cells (melanoma cell line) were exposed up to 72h to non-selective blockers (carvedilol and propranolol), β1 selective blockers (atenolol and metoprolol), and antineoplastics drugs (cisplatin and 5- fluorouracil) and their effects on cell viability studied. Atenolol and metoprolol (β1 selective) had no significant effect on the viability of A375 cells. However, the other tested drugs were able to affect cell viability allowing the determination of median lethal concentrations (LC_{50}). Thus, a toxicity ranking based on the LC_{50} could be established, from highest to lowest, as: cisplatin (2.46 (1.87 – 3.38), 5-fluorouracil (4.77 (4.48 – 5.07)), carvedilol (16.91 (15.47 - 18.99)) and propranolol (58.03 (57.08 - 59.11)). Carvedilol and cisplatin were, respectively, the most toxic beta-blocker and antineoplastic. This research supports the potential use of the non-selective β-blockers as adjuvants in cancer treatment.

Keywords: melanoma; cancer cell lines; beta-blockers; drug repurposing