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The Use of Radioimmunotherapy for the Treatment of Metastatic Melanoma

In 2017, an estimated 7 200 Canadians (91 000 Americans) were diagnosed with melanoma skin cancer. While surgical resection of the primary tumour can be effectively accomplished, there is no satisfactory treatment for patients with metastatic melanoma who do not respond or become resistant to immunotherapy. This reality projected that approximately 1 250 diagnosed Canadians (9 300 Americans) will have succumbed to the disease by the end 2017. Thus, there is a need for alternative effective approaches to treatment of metastatic melanoma. The approval of 223-Radium chloride (Xofigo) for treatment of metastatic prostate cancer and of 177-Lutetium-labeled somatostatin receptor binding peptides for neuroendocrine tumors, as well as recent successes of 177-Lu-A617 compound in patients with metastatic prostate cancer demonstrate the potential of targeted alpha or beta emitting radionuclides in treatment of cancers resistant to all other therapies. Through the use of targeted antibodies containing therapeutic radionuclides it becomes possible to deliver a site-specific lethal dose of radiation to cancer cells providing a direct and effective method for the treatment of metastatic melanoma. Biodistribution and microSPECT/CT imaging results show that a humanized antibody that targets “free”melanin in the tumour microenvironment, has high tumour uptake in B16F10 murine melanoma tumours in C57Bl/6 mice, while little to no uptake in naturally melanized tissues. Initial results indicate that 213Bi (alpha emitter) is more effective than 177Lu (beta emitter) for treatment of metastatic melanoma while both radiolabels did not produce significant side effects. Currently MTD and fractionation studies are underway to determine the best course of treatment.

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