Complete regression of solid B16F1melanoma tumors obtained by intratumoral injection of LTX-315 (Oncopore[®])

K. CAMILIO^{1,2}, Ø. REKDAL¹, B. SVEINBJØRNSSON^{1,2} ¹Lytix Biopharma AS, ²University of Tromsø, Norway

Introduction

Melanoma is the most serious type of skin cancer, causing about 75% of skin cancer related deaths worldwide. Standard treatment involves surgery, chemo- and radiation therapy, and immunotherapy for metastatic melanoma. However, these treatments have their shortcomings often leading to relapse post treatment.

LTX-315 (Oncopore[®]) is a chemically modified cationic cytolytic peptide which is equally active against drug-sensitive and drug-resistant cancer cells. Previous *in vivo* studies have demonstrated that treatment of syngeneic murine A20 B-cell lymphomas and CT26WT colon carcinomas with intratumoral (i.t.) injection of LTX-315 resulted in complete tumor regression and long-term protective effect against re-inoculated tumor cells (unpublished data).

B16F1 is a highly aggressive and non-immunogenic murine melanoma syngeneic to the C57BL/6 mouse model.

Aim

The present study was undertaken to investigate whether i.t. injections of LTX-315 induced an antitumor immune response *in vivo* in a highly aggressive murine melanoma tumor model.



Chemical structure of LTX-315 (Oncopore[®])

In vitro: The colorimetric 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazodium bromide (MTT) viability assay was used to investigate the cytotoxic effect of LTX-315 against a selection of human and murine cell lines. Cell lines were incubated with peptide solution for 4 hours.

In vivo: Pre-cultured B16F1 melanoma cells (5 x 104) were subcutaneously inoculated into the abdomen of syngeneic C57BL/6N mice and established tumors treated i.t. with LTX-315 or vehicle (three consecutive injections).

LTX-315

Methods

Results

LTX-315 rapidly kills murine and human melanoma cell lines in vitro. MTT cytotoxicity data for LTX-315 against a selection of normal and melanoma cell lines after 4 hours.

Cell line	Organ	Disease	LTX-315 IC ₅₀ (µM)
MRC-5	Lung	Normal	26
HUV-EC-C	Umbilical vein	Normal	28
RBC	Blood	Normal	>850
B16F1	Skin	Malignant melanoma	20
WM-266-4	Skin	Skin metastasis (primary ephoteloid tumor)	12
A375	Skin	Malignant melonoma	11



LTX-315 eradicates solid subcutaneous B16F1 melanoma tumor in vivo. Growth curves of LTX-315 treated animals (n=8) compared to controls (n=4)



Intratumoral treatment with LTX-315 leads to complete regression of solid B16F1 melanoma tumors. A and B: Animal injected i.t. with vehicle. C and D: Animal injected i.t. with LTX-315.

Conclusion

LTX-315 treatment induced complete regression of established B16F1 melanoma tumors.

Intratumoral administration of a cytolytic peptide might represent a novel local treatment for melanoma malignancies.

LTX-315 is currently being investigated in a Phase I clinical study.

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Intratumoral treatment with LTX-315 causes massive necrosis and cell infiltration

HE staining of tumor sections from control tumors (A+B) and LTX-315 treated tumors (C+D).

