COMPARISON THE EFFECT OF FIVE THAI EDIBLE PLANT EXTRACTS ON CANINE MAMMARY GLAND CARCINOMA CELL LINE AND CANINE ADIPOSE-DERIVED MESENCHYMAL STEM CELLS

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Introduction

Canviro®, formulated from extracts of five Thai edible plants—mangosteen, black sesame, soybean,guava, and gotu kola—has shown potential in modulating the immune system by reducing the viral load in HIV human patients and in FIV feline patients. In addition,it is believed that the extracts of five Thai edible plants might affects the cancer cells by induction apoptosis and inhibit cancer cell proliferation. However, the effect of Canviro® on dogs, particularly in an in vitro system, remain unexplored.

Objectives

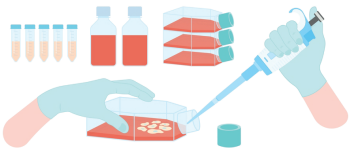
To determine the effects of Canviro® on the proliferation and gene expression of the canine mammary gland carcinoma cell line (CMT-U27) and canine adipose-derived mesenchymal stem cells (CADMSCs).

Methods

1. Canine mammary gland carcinoma cell line (CMT-U27) cells were cultured in RMPI 1640 supplemented with varying Canviro® concentrations for 24 hours
2. Cells were subjected to detect cell viability the MTT assay and subsequently calculated for IC50.
3. The concentration of 100 and 200 µg/ml were selected for supplementing into the growth medium of CMT-U27 and canine adipose-derived mesenchymal stem cells (CADMSCs). Cells were grown Canviro® -containing medium for 24 hours'
4. Cells were evaluated their proliferation via Ki67, Oct-4 expression by immunocy tochemistry.
5. Total RNA was collected from treated CMT-U27 and CADMSCs for analysis of immunomodulatory gene expression by RT-qPCR

Results

- Canviro® reduced CMT-U27 cell viability in a dose-dependent manner, with an IC50 of 208.9 µg/ml.
- Ki67-positive cells in CMT-U27 and CADMSCs slightly decreased with Canviro®.
- The oncogene Oct-4 was detected in both cell types.
- Canviro® downregulated IL-6 expression in both CMT-U27 and CADMSCs.
- PGE2 expression decreased in CMT-U27 but increased in CADMSCs. Additionally, 100 µg/ml of Canviro® decreased IDO expression in CMT-U27 but not in CADMSCs.



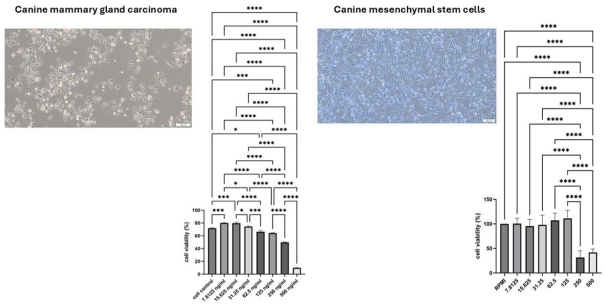


Figure 1. Effect of Canviro® on cell viability of canine mammary gland carcinoma cell line and canine adipose-derived mesenchymal stem cells.

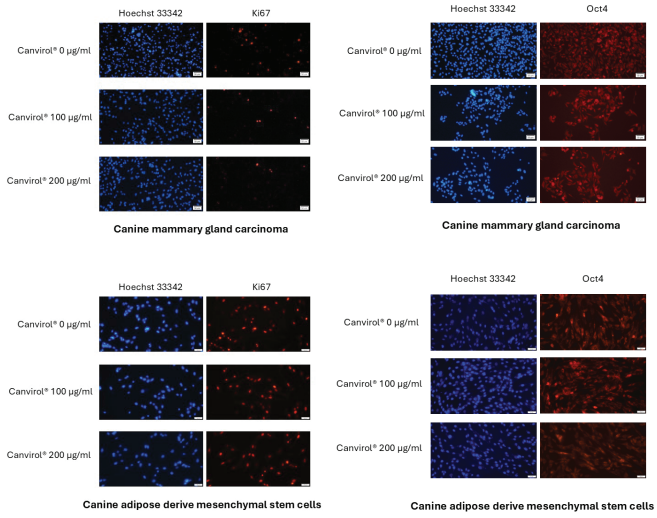


Figure 2. Effect of Canviro® on cell proliferation and oncogene (Oct-4) expression of canine mammary gland carcinoma cell line

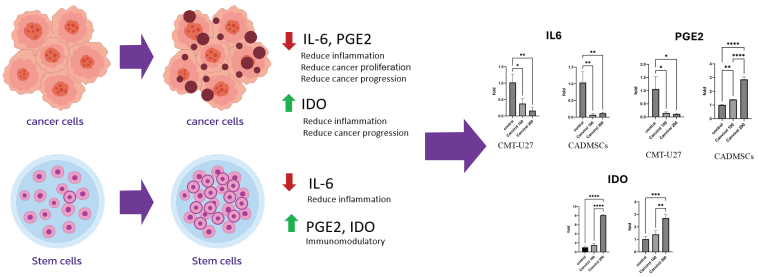


Figure 3. Effect of Canviro® on expression of immunomodulatory genes in canine mammary gland carcinoma cell line and canine adipose derived mesenchymal stem cells

Conclusions

Canviro® inhibited CMT-U27 cell viability and affected the expression of immunomodulatory genes in CMT-U27 and CADMSCs. The differential gene expression warrants further analysis to understand Canviro®'s mechanism in regulating the immune response in canine cancer and stem cells. IL-6 is involved in tumor growth and metastasis; thus, its downregulation can be beneficial in cancer therapy.

Conflict of interest statement

Killer T Cell For Pets Company Limited is the only funding sponsor without influence on the study trial.

References

1. Wiriyachitra P, Wiriyachitra S, Wonghiranyingyot S, et al. ByeByeHIV with Thai Innovation. Clin Immunol Res. 2024; 8(1): 1-7.
2. Wiriyachitra P, Leelahagul P, Wiriyachitra S, et al. Cancer Patient Life Quality Improvement by T-Cell Stimulation with Five Edible Plants. Clin Immunol Res. 2024; 8(1): 1-3.

Canvirol Cancer Research