

Effect of Hypoxia on the Response of Canine Mammary Gland Tumor Cells to Bovine Lactoferrin, Doxorubicin and Recombinant Human Erythropoietin

Felina Tan Peck Yen, ¹How Chee Wun, ¹Teo Guan Young & ^{1,2}Rasedee Abdullah

¹Institute of Bioscience

*²Department of Veterinary Pathology and Microbiology, Faculty of Veterinary Medicine
Universiti Putra Malaysia*

Abstract

The exact role of hypoxia in tumor biology remains controversial because there is no conclusive evidence on its effect on tumors. There is concern that tumor hypoxia is one of the causes of chemoresistance in cancer cells. Recently, erythropoietin receptors have been found in human breast cancer cells indicating that recombinant human erythropoietin (rHuEPO) treatment of cancer-related anemia can influence the functions of the cells. Bovine lactoferrin (bLF) was also shown to have antiproliferative effects on cancer cells. The aim of this study was to determine the *in vitro* effects of rHuEPO, bLF and Doxorubicin (DOX) on a canine mammary gland tumor cell line, CMT-stylo cells, under hypoxic condition. The cells were treated with bLF, rHuEPO, DOX, rHuEPO and DOX and bLF, rHuEPO combinations. These treated cells were subjected to MTT assay. The results showed that hypoxia lowered the proliferation rate of the CMT-stylo cells while combination treatments showed improved killing. Flow cytometry analysis showed that DOX had cytotoxic while bLF had antiproliferative effects on the CMT-stylo cells.

Keywords: hypoxia, canine mammary gland tumor, MTT assay, flow cytometry, Doxorubicin, bovine lactoferrin, recombinant human erythropoietin.