

NEWS FROM THE WORLD OF ONCOLOGY

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The Role of COX-2 Inhibition in Cancer Treatment

A growing body of evidence now exists which demonstrates value for the use of cyclooxygenase (COX) inhibitors in treatment protocols for many different types of cancer.

Many tumours have been demonstrated to over express the COX-2 receptor. The major function of COX-2 is to modulate the production of pro-inflammatory prostaglandins (PG). Within a tumour many substances can induce COX-2 activity. These include the pro-inflammatory cytokines (IL-1, IL-6, TNF- α), growth factors and oncogenes. With the expression of these factors, PG production is induced and the end result is an inhibition of immune surveillance, promotion of angiogenesis and inhibition of apoptosis.



Circulating PG inhibits the function of T and B-lymphocytes, cytotoxic T cells and natural killer cells. When these cells are inhibited, the regular function of the immune system is interrupted. This means the immune system is less able to mount an appropriate protective response against the cancer. The promotion of angiogenesis essentially creates a "pro-growth" environment within the tumour. Tumour cells must be within 1mm of a blood vessel to survival, thus angiogenesis supports the growth and development of a tumour. The function of many tumour suppressor genes (e.g. p53) is down regulated by COX-2 expression. This essentially makes tumours able to evade the signals for programmed cell death being sent from the body's immune system. COX-2 expression therefore plays a very important role in creating a "pro-cancer" environment.

Recently the use of COX-2 inhibitors has become part of multi-modality treatment protocols for many different cancers. There have been studies investigating survival advantages with the inclusion of this class of drugs in treatment protocols. There have also been many studies proving that some tumours over-express the COX-2 receptor, the suspicion being that COX-inhibition will also provide a survival advantage.

Currently I recommend that COX-2 inhibitors be combined into the treatment protocol and long-term treatment plan for any tumour demonstrated to be an expresser of the COX-2 receptor.

Tumour	COX-2 Expression Demonstrated	Survival Advantage with COX-2 Demonstrated
Transitional Cell Carcinoma	Yes	Yes (dogs and cats)
Prostatic Carcinoma	Yes	Yes
Oral Squamous Cell Carcinoma (dogs and cats)	Yes	Yes (dogs)
Oral Melanoma	Yes	Yes
Cutaneous Squamous Cell Carcinoma (dogs)	Yes	No
Mammary Gland Adenocarcinoma (dogs)	Yes	No
Osteosarcoma (dogs)	Yes	Yes
Renal Cell Carcinoma (dogs)	Yes	No
Nasal Cell Carcinoma (dogs)	Yes	No
Colorectal Tumours (dogs)	Yes	No

Dr. Kevin Finora is a board certified Oncologist and Small Animal Internist. He sees patients Wednesday (including evenings) to Saturday at VEC/RC South. Please do not hesitate to contact Dr. Finora if you have any cancer related questions.

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