Expression of the ABCG2 transporter in canine tumor cells

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ABCG2 (ATP-Binding Cassette sub-family G, member 2) is a membrane-spanning protein that transports xenobiotics unidirectionally out of cells, preventing the intracellular accumulation of pharmaceutical agents. ABCG2 was initially identified in a highly chemotherapy-resistant breast cancer cell line, and was demonstrated to be responsible for the resistant phenotype. Since its initial discovery, ABCG2 expression has been detected in human cancer patients with resistant lymphomas, sarcomas, and carcinomas. Due to the chemotherapy-resistance it imparts, ABCG2 expression is a poor prognostic indicator in a variety of human tumor types including squamous cell carcinomas, leukemias, lung tumors, and others. Whether or not ABCG2 contributes to chemotherapeutic resistance in canine tumors is unknown. Thus, we investigated the hypothesis that ABCG2 is expressed by canine tumor cells.

A variety of archived tumor samples from the Washington State University Oncology Service were evaluated for expression of ABCG2. In total, 4 osteosarcomas, 4 melanomas, 4 sarcomas, 4 carcinomas, and 1 mast cell tumor were examined using RT PCR and each contained functional ABCG2 genotype. Immunoblotting to detect ABCG2 protein was performed on proteins from 2 melanomas, 2 carcinomas, 2 sarcomas, 1 osteosarcoma, and 1 mast cell tumor. ABCG2 expression was confirmed in all cases, except 1 carcinoma and 1 sarcoma.