Expression of the ABCG2 transporter in canine tumor cells

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$ABCG_2$ (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. $ABCG_2$ 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, $ABCG_2$ expression has been detected in human cancer patients with resistant lymphomas, sarcomas, and carcinomas. Due to the chemotherapy-resistance it imparts, $ABCG_2$ 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 $ABCG_2$ contributes to chemotherapeutic resistance in canine tumors is unknown. Thus, we investigated the hypothesis that $ABCG_2$ is expressed by canine tumor cells.

A variety of archived tumor samples from the Washington State University Oncology Service were evaluated for expression of $ABCG_2$. In total, 4 osteosarcomas, 4 melanomas, 4 sarcomas, 4 carcinomas, and 1 mast cell tumor were examined using RT PCR and each contained functional $ABCG_2$ genotype. Immunoblotting to detect $ABCG_2$ protein was performed on proteins from 2 melanomas, 2 carcinomas, 2 sarcomas, 1 osteosarcoma, and 1 mast cell tumor. $ABCG_2$ expression was confirmed in all cases, except 1 carcinoma and 1 sarcoma.