

A new prototype ELISA for determining TK1 protein levels in canine blood malignancies and its clinical applications



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Thymidine kinase 1 (TK1) is a salvage pathway enzyme for DNA precursor synthesis and its expression is S-phase dependent. Leakage of TK1 out of the cell reflects both the overall degree of DNA synthesis and the number of cells dying in the replicative stage. Serum TK1 enzyme activity is an established biomarker for canine blood malignancies.

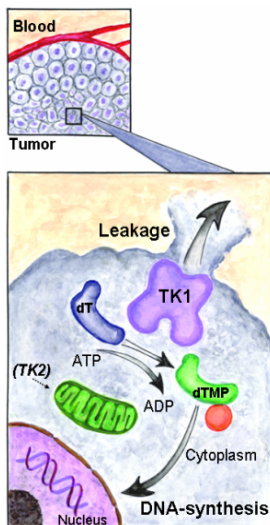
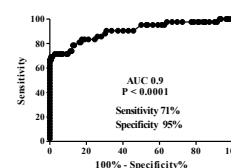


Fig. von Euler et. Al. J vet Intern Med 2004; 10

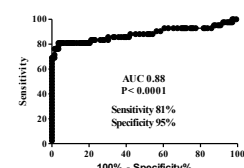
Serum TK1 activity correlates with stage, prognosis, and relapse in dogs with lymphoma. The purpose of this study was to evaluate the performance of a new canine TK1 ELISA for prognosis and therapy monitoring in this type of malignancies.

Materials and methods: Serum samples from dogs with hematologic malignancies i.e. malignant lymphoma (N=37), acute leukemia (n=4) and sera from healthy dogs (n=141), were analyzed for TK1 activity with a [³H]-deoxythymidine (dThd) phosphorylation assay and TK1 protein concentrations by a canine TK1 sandwich ELISA based on two polyclonal rabbit anti dog TK1 antibodies from Alertix Veterinary Diagnostics AB³

References can be provided upon request by corresponding author Dr. Saellström.



Receiver operating curve (ROC) based on TK1 activity values for dogs with hematologic malignancies (n = 41) and healthy dogs (n = 141).



ROC curve analysis of the TK1 protein values from healthy (n = 141) and the hematologic malignancy groups (n = 41) of dogs.

Results: Both TK1 assays showed significantly higher levels in hematologic malignancies compared to healthy dogs (P<0.0001). The ROC-curve analysis demonstrated that the TK1 ELISA has similar sensitivity (81% vs 71%) as the TK1 activity assay (AUC = 0.88 vs 0.90). Furthermore, the levels of serum TK1 (both protein and activity) fluctuate in parallel with clinical outcome parameters during chemotherapy. A combination of the TK1 ELISA or TK1 activity values with the CRP values increased the diagnostic performance by 20%.

Conclusions:

These results showed that the polyclonal canine TK1 ELISA is as precise and sensitive as the TK1 activity assay



for detection and monitoring of therapy in canine hematological malignancies. The combination of TK1 ELISA with CRP may aid in the diagnostics and clinical monitoring of different canine malignancies and thus serve as a valuable tool in veterinary medicine.