



Detecting cancer and other serious health problems with Rametrix® Molecular Urinalysis (RMU)

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Unfortunately, dogs get cancer. In fact, nearly 50% of dogs over middle age (5-7 years) old will either suffer from cancer or die as a result of cancer. In a study of malignancy (cancer) in Bernese Mountain Dogs and Golden Retrievers, for example, more than 58% of the dogs died from cancer (multiple types, including lymphoma and histiocytic/soft tissue sarcoma). Dog owners are well-aware of the devastating toll that cancer takes on their dogs and the people/families that own them.

We would like to change this narrative. First, we need to understand the unique aspects of cancer in Westies, including onset, progression, and outcomes. Genomic studies eventually will help pinpoint specific genomic risk factors (mutations) driving cancer initiation and progression. We also need to develop tests to detect the onset of cancer and to find more effective ways to treat cancer once it is detected.

Rametrix Technologies, Inc., a medical/veterinary medical research and development company (www.rametrixtech.com), has developed a **urine-based technology (RMU)** to detect cancer in dogs (and people). The technology uses Raman spectroscopy to profile the molecular composition in urine – detecting changes associated with alterations in metabolism and inflammation associated with cancer. We published a paper (available on the website) describing cancer detection in dogs using this technology. We have been able to detect lymphoma, mast cell sarcoma, urothelial/transitional cell carcinoma, and osteosarcoma – using changes in the molecular composition of urine - with at least 90% accuracy using RMU technology. The urine-based test is simple (requires less than 10 ml of ‘free-catch/voided’ urine), fast (results within 30 minutes), and economical (about the same price as a standard urinalysis at the veterinarian’s office).

We realize that there are other common metabolic, digestive and musculoskeletal problems in Westies. Some of these problems, especially affecting kidney function and metabolism, may be detectable as variations in the molecular composition of urine. For example, in studies we conducted on human urine, we were able to detect diabetic nephritis, lupus nephritis, chronic kidney failure, and bladder cancer. We will use this **translational information** gained from humans in the proposed work on Westie health.

To further validate RMU and to precisely focus it for Westies, we are proposing to conduct a **500-dog study** (250 healthy dogs, 250 dogs with cancer or other health problems, including kidney disease) in concert with and the sponsorship of the Westie Foundation of America. The study would occur over 2-3 years and has these specific goals:

- Develop a Westie-specific molecular fingerprint of urine in healthy Westies; this will document normal metabolism, physiology, and state of kidney function;

- Determine how the urine molecular fingerprint of healthy dogs compares with the urine molecular fingerprint of dogs with cancer (especially bladder cancer) or other health problems;
- See if changes occur in the urine molecular fingerprint of dogs that were previously healthy (i.e., samples collected before disease) when dogs develop cancer or other diseases – this will result from analysis of samples from the same dogs over time;
- Detect and profile (with RMU) other health problems that are or have been common in Westies.

Our goal is to develop a readily-available technology for detecting cancer and serious health problems in Westies – with the ultimate goal of early disease detection and helping to develop effective treatments that can **alleviate suffering and save dog's lives**.

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