

DEVELOPMENT OF A NATIONAL CANINE CANCER BIOSPECIMEN REPOSITORY

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HEALTH

Background

In June of 2004, an informal collaboration of veterinary and medical oncologists, pathologists, surgeons, geneticists, and molecular and cellular biologists gathered at a meeting hosted by the Broad Institute, in Boston, MA. These investigators shared a common interest, the comparative study of canine and human genomics and cancer. With the availability of the canine genome, they sought to utilize the defined genetics of the companion animal to better understand the biology of cancer, to provide a forum to share ideas and resources, and to guide the development of novel technologies. Early priorities of the Canine Comparative Oncology Genomics Consortium (CCOGC) include advancing the cooperative efforts of human and veterinary medicine, the development of a mechanism to share resources in the community and the development of a biospecimen repository.

Biospecimen Repository

CCOGC collaborators determined that an essential resource needed was the development of well-described repository of tissues (tumor and normal) from tumor-bearing dogs. To be valuable, this biospecimen repository would be:

- Focused on specific cancers of interest to the field

- Centrally housed with multiple contributors
- Populated with prospectively collected tissues and fluids
- Annotated with robust clinical data with standard terminology
- Managed through a web-enabled port
- Publicly accessible based on scientific merit of requesting individuals

The repository has begun with a goal of collecting tissues and fluids from 3,000 dogs with specific cancer types over a three-year period. The specific cancers will represent those that are not only major problems in the dog population, but which also have comparative value in human cancer investigation. Universal and cancer specific standard operating procedures have been defined for the collection of specimens. The bank is housed within a biospecimen repository in Frederick, Maryland with contributors including qualified schools of veterinary medicine in the United States.

In 2006, the CCOGC entered into a strategic partnership with Morris Animal Foundation (MAF) and the AKC Canine Health Foundation (AKC CHF) to seek the funding needed to establish the tissue bank. This partnership resulted in the boards of the CHF and MAF approving funding to the CCOGC of \$250,000 each and

a further commitment to assist in seeking the remaining \$1,700,000. With \$500,000 in initial funding, the CCOGC released a request for proposals from US institutions that wished to be considered as CCOGC collection sites. In the summer of 2007, Pfizer Animal Health provided a lead gift in the amount of \$1,100,000 through a working relationship with the MAF. In recognition of the importance of this gift, the formal name was changed to "Pfizer-CCOGC Biospecimen Repository".

Biospecimen Repository and Its Procedures

The biospecimen physical repository houses tumor tissue, normal tissues, serum, plasma, peripheral blood mononuclear cell preparations, genomic DNA, RNA and urine samples. Each of the 3000 cases will have tumor and normal tissue collected and processed for three different storage methods. Whole blood samples will be collected and processed prior to freezing.

The collection, processing, and shipment of samples (whole blood, serum, plasma, urine, and diseased and normal tissues) are standardized and the personnel are trained in these procedures to ensure the highest quality of the repository. Sample quality and assurance will be reviewed and recorded contemporaneous with sample collections for quality control.

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Pfizer CCOGC Biospecimen Repository Tissues

It was decided that the specific cancers to be selected should represent those that were not only major problems in the dog population, but which also have significant comparative value in human cancer investigation. Cancer specific goals included the collection of 600 samples each from dogs with lymphoma, osteosarcoma and melanoma. Samples collected from each patient will include tumor, normal tissue, blood, and urine. An additional 1,200 samples would represent four other histologies (300 each), selected in consultation with the broader community and sponsoring agencies.

Comparative Pathology Review

For each cancer histology identified for collection a web-based and digital pathology review will be organized. The goal of this pathology review will be to validate the diagnosis of submitted tissues and to provide a forum for comparative assessment of canine and human cancers. These reviews will involve highly regarded veterinary and human pathologists and will yield position papers on the pathological description and comparative description of cancers by histology.

Progress

The Pfizer CCOGC Biospecimen Repository has initiated collection of tissues at three institu-

tions (Colorado State University, Ohio State University and the University of Wisconsin-Madison). Sites were selected based on case-load, experience with sample collection, personnel and physical infrastructure, and institutional commitment to the banking effort. A second request for proposals (RFP) has been recently distributed to all US Colleges of Veterinary Medicine that seeks to identify up to seven additional collection sites that will work towards the initial 3,000 patient collection goals for the repository. 🐾

Dr. Breen is the current Treasurer and was a member of the steering committee for the CCOGC. He is a world renowned researcher in canine cancer.