



Matthew Breen



Oscar J. Fletcher Distinguished  
Professor of Comparative  
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### Title: Comparative genomics for accelerating cancer gene discovery

#### Research emphasis:

Dr. Matthew Breen's research focuses on genomics, genome mapping and the comparative aspects of animal cancers, with emphasis on cancers in the domestic dog. In addition his lab is using high throughput molecular cytogenetics for anchoring emerging genome assemblies and for evaluating the changes to genome structure that occur during speciation. The lab is developing new molecular assays for diagnostic and prognostic use in veterinary medicine. In addition, we are working with new approaches to tackle illegal animal killing/trafficking and aid wildlife conservation.

#### Application :

- Molecular cytogenetics
- Canine cancer surveillance
- Comparative genomics
- Cancer genomics
- Wildlife forensics

#### Collaboration potential:

- Canine models of cancer
- Cytogenetics
- Clinical genomics
- Forensics

#### Selected publications:

Ingegerd Elvers, Jason Turner-Maier, Ross Swofford, Michele Koltookian, Jeremy Johnson, Chip Stewart, Cheng-Zhong Zhang, Steven E Schumacher, Rameen Beroukhim, Mara Rosenberg, Rachael Thomas, Evan Mauceli, Gad Getz, Federica Di Palma, Jaime F Modiano, Matthew Breen, Kerstin Lindblad-Toh, Jessica Alföldi. (2015). Exome sequencing of lymphomas from three dog breeds reveals somatic mutation patterns reflecting genetic background. [Genome Res. 25: 1634-1645](#)

Shapiro, S, Knapp, D, and Breen, M. (2015). A cultured approach to canine urothelial carcinoma: molecular characterization of five cell line. *Canine Genetics and Epidemiology* 2:15 [on-line access](#)

Schiffman, J.D. and Breen, M. (2015). Comparative Oncology: What dogs and other species can teach us about humans with cancer. [Philosophical Transactions of the Royal Society B: Biological Sciences. 370 \(1673\)](#)

Shapiro, S.G., Raghunath, S., Williams, C., Motsinger-Reif, A., Cullen, J.M., Liu, T., Albertson, D., Ruvolo, M., Bergstrom Lucas, A., Jin, J., Knapp, D. Schiffman, J.D. and Breen, M (2015). Canine urothelial carcinoma: genomically aberrant and comparatively relevant. [Chromosome Research 23:311-331](#)