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Canine Genomes Study by Elaine Ostrander Helps Researchers Get a Better Grasp of the Complexity of “Man’s Best Friend”
Featured at 2014 ACVIM Forum, June 4-7 Nashville, Tennessee

(Denver, Colo.) Step-by-step, twist-by-twist, the National Institutes of Health Canine Genome Study is providing everyone with a better understanding of this creature we call “man’s best friend.”

Elaine Ostrander, head of the Comparative Genetics Unit at the National Human Genome Research Institute at National Institutes of Health, Bethesda, Md., says, “We are working on developing tools that allow us to gain information from families or populations when only a small number of individuals have been provided DNA for study.”

Ostrander, who will be addressing attendees at the 2014 ACVIM Forum Thursday, June 5 2:10–3:00 p.m. at the Gaylord Opryland Resort & Convention Center in Nashville, Tennessee on “Genomics on Both Ends of the Leash,” says that by using statistical tools “we can infer the DNA sequence that is missing with high accuracy,” which, in turn allows her team “to paint a complete picture of a DNA sequence common to a family or a population.”

Certain breeds, Ostrander says, are predisposed to particular diseases. Previously the community had the reference sequence of the boxer and a few other spurious breeds. “Our large and systematic data analysis of many breeds will make it possible for people studying any of the common breeds to compare the sequence of dogs that have a particular disease to the sequence of healthy dogs from the same breeds, thus making it possible to find disease genes with much greater ease.”

Researchers in the Ostrander lab and others have been working on the canine genome project for two decades, beginning by making maps of the dog genome which allowed investigators to navigate the dog chromosomes long before any genome was sequenced.

In recent years, Ostrander’s team has been interested in genes—the blueprints in life—that are important in controlling the variation of body types between breeds, such as the giant Saint Bernard and Great Dane vs. the tiny Pekingese and Chihuahua, or the long legs of the Irish wolfhound vs. the short-legged corgi.

“We are trying to understand the genes that control differences in body type, for example, skull shape,” she adds. “Think pushed-in face like a pug vs. the narrow, elongated face of the collie. It turns out that a modest number of genes are important in controlling those differences and the same ones likely play a role in mammalian craniofacial development. We are trying to link these, including candidates like the BMP3 gene (known for its ability to induce bone and cartilage development), to specific craniofacial disorders.”

Canine skull shape, she continues, is complex and involves many genes and their interactions. But by studying more than 400 breeds worldwide researchers can unsnarl such traits as skull shape, which in some breeds is a defining feature and the result of selective breeding.

The study’s revelations, Ostrander says, are important for human health and biology, especially for children born with craniofacial deformities. “This is a way to figure out what sort of genetic variation matters and what doesn’t,” she explains.
To extend the canine map to more projects, breeds from groups previously underrepresented are being added such as terriers—Irish terrier, rat terrier and Bedlington terrier—and the number of small and large breeds are being increased by including the Dogue de Bordeaux, Neapolitan mastiff, Affenpinscher and Japanese Chin. Ostrander’s team is also collecting native breeds such as the Cirneco dell’Etna from Italy, Tazi from Kazakhstan, Tibetan mastiff from China and Azawakh from Republic of Mali. Overall, the Ostrander lab believes that by learning about the genome of the dog we can improve the health of both man and his best friend.

**Media Note:** Accredited members of the media may attend the 2014 ACVIM Forum at no charge. However, you are required to register with the ACVIM. For media registration, please fill out a **registration form** or contact Laurie Nelson at [Laurie@ACVIM.org](mailto:Laurie@ACVIM.org) or 303.231.9933.

**On-site Press Room**
Location: Gaylord Opryland Resort & Convention Center
Hours:
- Wednesday June 4, 2:00–5:00 pm
- Thursday June 5, 8:00 am–5:00 pm
- Friday June 6, 12:00–5:00 pm
- Saturday June 7, 8:00 am–12:00 pm

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The ACVIM hosts the ACVIM Forum, an annual continuing education meeting where cutting-edge information, technology and research abstracts are showcased for the veterinary community. More than 3,000 veterinary specialists, veterinarians, technicians and students attend.

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