



Going to the dogs?

Do medical lab scientists yet know the extent to which researchers have been using animals as lab testers? Do they see technology — not Rover, Lassie, or Fido — as solving lab problems with accuracy? As *MLO* recently reported, trained African rats accurately detected positive-TB rates at 44% over traditional microscopy rates in 10,000+ sputum samples from Tanzanian patients — 620 new TB-positive patients (see the December 2010 *Am J Trop Med Hyg* at www.ajtmh.org).

After the rats received global acclaim, a talented black Labrador retriever hit the news: “Dogs can learn to detect disease, protect humans, experts say” barked the headline. A new study adds to mounting evidence that man’s best friend cannot only learn to “heel” but also “heal” by detecting invisible signs of disease. The specially trained 8-year-old “Labrador laboratory” detected colorectal cancer 91% of the time when sniffing patients’ breath and 97% of the time when sniffing stool from among the 185 patients with and without cancer, says the Japanese researchers’ Jan. 31 article in the British journal *Gut*.

The dog beat the fecal occult blood test, which positively predicts colorectal cancer only 10% of the time. The dog’s “scent judgment” was not affected by whether patients were smokers or not and was not confused by conditions like inflammation or infection. For compensation, all the dog expected was the chance to play with a tennis ball. (You asked for *what?*)

Introducing a doggie’s scent judgment into clinical practice, says the study, is expensive, besides which, it varies among dogs — even with “same dog, different day” — making standardization of canine-based diagnostic tests tough. In the past five years, credible, peer-reviewed studies have shown various breeds and ages, after a few weeks of training, can become experts at spotting cancer in breath, blood, urine, and tissue samples from patients with lung, breast, ovarian, and bladder cancers. (You thought dogs were just cute, right?) Depending on the breed, a dog’s sense of smell is estimated to be up to 1 million times better than that of a human’s. Dogs have been trained to smell chemicals signaling seizures in epileptics and elevated blood-sugar levels in diabetics (<http://tinyurl.com/4af8b26>).

In New South Wales, Australia, a 1-year-old Cavalier King Charles Spaniel is being trained by prison inmates to pick up changes in people’s body odor or breath so he can be a diabetic-alert dog. Once he learns that sweet, fruity smells warn of high blood-sugar levels, while rusty, acidic smells indicate low blood sugar, he will be given to a family with a diabetic child to alert the parents to changes in his glucose levels (<http://tinyurl.com/4wccqjj>).

At Hungary’s Dogs Against Cancer and For Life Foundation, dogs can recognize malignant tumors by sniffing air samples exhaled by humans. Experiment results show lung cancer is recognized with 99% accuracy, while breast cancer is diagnosed with 88% accuracy by dogs sniffing people’s breath, whereas their correctness, on average, is 60% to 80% (<http://tinyurl.com/3gzjof>).

Using chromatography and mass spectroscopy, which can detect trace amounts of chemicals in a sample, scientists want to find out precisely what it is that these dogs smell, which might shed light on what cancer is and how best to attack it at the molecular level.

But do not jump to conclusions! Animals will *not* replace lab personnel. What these dogs do not yet know is that their scientist-trainers hope one day to build an electronic nose as good — but not nearly as *wet* — as a dog’s. So, if a dog comes to sniff in your lab, keep a straight face and do not mention the e-nose!


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