How does personalized medicine for canines compare with the human version?

Companion animal genome projects provide the basis for increased genetic testing of dogs. Breeders and owners drive selection of genetic traits and testing for hereditary conditions; there is no parallel in human medicine.

Findings

Direct to consumer canine genetic testing is promoted by commercial laboratories and some veterinary college laboratories. Veterinary colleges tend to offer health-related tests while commercial laboratories offer disease testing, breed and trait (color) and parentage testing, as well as DNA storage.

Three comparison areas are parentage testing, disease screening, and pharmacogenomics.

Genetic testing for von Willebrand’s disease in humans and dogs allows for preventive practices in surgery.

Canine pharmacogenetic investigations include drug sensitivity testing for the mutant MDR1 gene. This test is available to owners who submit cheek brush samples by mail for analysis. As there is not a MDR1 test for humans, it was compared with the Cytochrome P450 2C19 test.

Exploration

Breed organizations and associated disease registries play an extensive role in promoting and funding canine genetic testing research and its commercial applications. The American Kennel Club is a purebreed registry whose Canine Health Foundation maintains Linkage and Direct DNA Canine Genetic Tests Offered, a list by disease, breed and laboratory. The 4/22/09 list had 63 tests from 3 commercial labs, the Animal Health Trust (private U.K. charity), and 10 universities. In comparison, the human GeneTests database contains 603 laboratories testing for 1,716 diseases.

The Orthopedic Foundation for Animals is a disease registry which licenses DNA-based disease testing on degenerative myelopathy and Fanconi syndrome in collaboration with the University of Missouri.

Conclusions

Society permits DNA testing of dog samples for purposes that would have ethical ramifications in humans. Commercial DNA testing to identify dog breeds contributing to a mixed breed dog is common, where tests to identify race and ancestry are a highly charged psychosocial, ethical, legal, political and health-related issue (1).

Criminal DNA testing of dog feces to identify dogs is taking place in Israel, Italy and other countries. The U.S.-based BioPet Vet Lab has the PooPrints program, which allows dog droppings to be matched to specific canines in a registry. It costs $29.95 to register a dog’s DNA initially and waste analysis runs $49.95 per sample (2,3). A high throughput sample for STR markers for the FBI’s CODIS (Combined DNA Index System) costs about $50 (4).

Lessons from canine genetic testing about test advertising, costs, available information, as well as risk, test interpretation and resulting carrier status implications may indicate where the marketplace aspects of human personalized medicine are headed.

References


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