

Strand is spearheading pet NGS diagnostics

by offering end-to-end solutions from assay design to reporting



COMPARATIVE BIOINFORMATICS ANALYSIS

- ▶ Strand has developed a tool kit for *in silico* mutational analysis of pathogenic cancer variants in canines by comparing with well-known human cancer variants to predict high confidence orthologs
- ▶ We have built pipelines for analysis of canine cancer whole exome data, analyzed 600+ WES samples, and ported the NGS pipelines in Snakemake for a past client
- ▶ Our comparative genomics tool kit can be extended to other organisms, with minimal modifications and has evolved via several iterations to work offline with short runtimes using publicly available annotations

PANEL VALIDATION

Assay Protocol Standardization

- ▶ Streamline DNA library preparation for enrichment-based panels
- ▶ Optimize qPCR-based estimates of canine cfDNA integrity and quantification for liquid biopsy assays
- ▶ Standardize blood collection protocols, including selecting suitable blood collection tubes, logistics and storage

Analytical Validation

- ▶ Employ bioinformatics analysis to study QC, coverage metrics and limits of detection, with comprehensive documentation
- ▶ Ensure precision and accuracy by evaluation of repeatability and reproducibility across operators, kits and sequencing runs
- ▶ Assess to verify that cross-contamination and carry-over contamination are minimal

Clinical Validation

- ▶ Perform clinical validation in our CAP lab in India using client-procured clinical samples

Additionally, overall assay standardization extending beyond the above can be performed.

PANEL DESIGN & DEVELOPMENT

- ▶ Conduct background research on panel design parameters, including genomic regions, variants, library preparation and sequencing technologies
- ▶ Optimize selected genes and variants based on panel size and budget constraints to create an affordable yet effective panel
- ▶ Perform quality checks to ensure the inclusion of the most relevant genomic regions for the panel and maximize clinical utility for a given panel footprint
- ▶ Our KB and custom bioinformatics approaches have resulted in a panel manifest with clinically relevant genes and variants for early cancer detection in dogs, for a previous canine Dx client

KNOWLEDGEBASE (KB) DEVELOPMENT

- ▶ Strand has curated a canine KB of genes, variants, breeds and diseases
- ▶ The KB is a result of manual curation of >1000 articles on canine cancer capturing information on top breeds, genes, variants and cancers
- ▶ This curated KB not only contributes to panel design but also aids in clinical reporting

BREED CLASSIFICATION

- ▶ We have developed a breed classifier for a canine Dx client based on 4000 germline SNPs across 600 samples from 150 breeds
- ▶ Employing a tree-based approach, the classifier estimates breed composition with 80% sensitivity
- ▶ The breed classifier aids in assessing health risks associated with specific breeds and determining consumer information quotient



We Solve Problems in Genomics.

23
YEARS

~175 SOFTWARE ENGINEERS &
BIOINFORMATICIANS
BIOINFORMATICS & SOFTWARE

23 years of providing bioinformatics solutions to global instrument, diagnostic and pharma companies

16
YEARS

~35 MOLECULAR BIOLOGISTS
CURATION

16 years of curating variants, genes, pathways and diseases for clinical reporting and pharma biotech custom solutions

12
YEARS

~50 LAB SCIENTISTS,
CLINICAL RESEARCH SCIENTISTS
OMICS ASSAYS

12 years of working with sequencing- based diagnostics across oncology and inherited/complex disorders, at our India CAP lab

150+ CURATION PROJECTS

500+ PROJECTS

150+ BIOINFORMATICS PROJECTS

200+ SOFTWARE DEVELOPMENT PROJECTS