
A Tale of two dogs: Canine CGP uncovers genetic predisposition clue and new hope for treatment

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Beckett and Sherlock, two Bloodhound girls (ages 6 and 5), have dedicated their lives working as search and rescue dogs. But their greatest challenge isn't just in the field, they also face a complex battle with cancer. Despite this, they continue to serve with unwavering commitment. Beckett was first diagnosed with an ovarian mass in 2021, which later progressed to a mediastinal mass with effusion and lung involvement (noted on 8/7/2024). Over the years, she received metronomic chemotherapy, carboplatin, palladia, and gilvetmab. Meanwhile, Sherlock was diagnosed with lymphoma in September 2023 and underwent two rounds of CHOP-based chemotherapy.

Despite Dr. Hamilton's tireless efforts and previous genomic testing, both dogs faced progressive disease, with few treatment options remaining. VetOmics' Canine CGP was pursued to uncover new therapeutic insights.

A shared genetic predisposition clue

Although Beckett and Sherlock had different types of cancer, and distinct overall tumor mutation profiles, both harbored multiple inactivating *FANCD2* mutations (D191fs, V262fs and splice site mutations), likely representing germline variants. *FANCD2* plays a crucial role in DNA repair signaling, and loss-of-function *FANCD2* mutations can lead to genomic instability. In humans, germline *FANCD2* mutations are linked to Fanconi anemia, a cancer predisposition syndrome that increases cancer risk (PMID: 23653579). In dogs, a similar condition has not been documented. However, research has identified mutations in genes associated with the Fanconi anemia pathway in certain canine cancers (<https://www.biorxiv.org/content/10.1101/508101v1.full>)

Precision medicine in action

Based on these findings, carboplatin plus olaparib was recommended as the primary treatment approach for both dogs, with ibrutinib and sirolimus as backup options. Notably, no strong biomarkers suggested immunotherapy would be effective in these cases.

"It's interesting that despite having two different cancers, both dogs were identified as candidates for carboplatin, olaparib, and ibrutinib, and may benefit from similar drugs."

---Dr. MJ Hamilton

Why this matters

Dr. Hamilton highlighted a growing shift in cancer treatment, moving beyond traditional one-size-fits-all approaches to precision medicine, where therapies are chosen based on the tumor's genomic/molecular makeup rather than just its cancer type or location in the body.

For pet owners, this means more hope and more options. For veterinary professionals, it reinforces the power of genomic insights in guiding more effective treatment decisions.

At VetOmics, we believe the true measure of success is how patients respond to genomics-guided therapy. Now, armed with unbiased and comprehensive insights, we eagerly anticipate how Beckett and Sherlock will respond to their new treatment plan. More to come!