



# Assessing tumor behavior and response to therapy

**A method to identify biomarkers for the detection of tumor behavior and/or increased risk for tumor metastasis in order to improve patient outcomes in both humans and animals.**

## Applications

- Prognostic testing for osteosarcoma in humans and dogs to inform treatment
- Biomarker development for cancers

## Key Benefits & Differentiators

- **Informs treatment strategy:** Classification of osteosarcoma based on growth and likelihood of metastasis helps determine how aggressively to treat.
- **Applicable to humans and dogs:** Identified transcriptomic biomarkers conserved across both species.
- **Useful in other cancers:** Overall approach can be applied to a variety of other cancers to identify biomarkers in order to classify tumor phenotypes and inform therapeutic approaches.

## Classifying osteosarcoma risk

Overall survival of patients with osteosarcoma (OS) has improved little in the past three decades, and better models for study are needed. In a variety of diseases, biomarkers have shown the potential to predict patient responses to various therapies. The Osteosarcoma Biology Group at the University of Minnesota has identified a set of cancer biomarkers that can be used to stratify and classify osteosarcoma by tumor growth rate and metastatic propensity. The newly identified panel of biomarkers provides tumor-specific information that can be used to individualize cancer treatment mode and intensity in both humans and dogs.

The novel biomarkers were identified using transcriptional profiles of osteosarcoma tumors and cell lines derived from humans, mice and dogs. The researchers identified a Gene Cluster Expression Summary Score (GCESS) that was found to be conserved across species that quantifies tumor heterogeneity and is associated with patient outcome. For osteosarcoma identification and classification, the most relevant GCESS values were linked to immune genes regulating cell cycle and those expressed by immune cells. Using both human and canine samples, this approach was able to successfully categorize osteosarcomas and the likelihood of metastasis in a given patient for both species. This approach has the potential to identify significant biomarkers to measure the metastatic propensity or response to treatment for a wide range of other cancers.

## Phase of Development

### TRL: 3

Biomarker signature identified for characterizing the metastatic propensity or "aggressiveness" of osteosarcomas in both humans and dogs.

## Technology ID

20160224

## Category

Life Sciences/Biomarkers

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## References

1. Milcah C. Scott, et al.(2018) , <https://www.doi.org/10.1158/0008-5472.CAN-17-0576>, Cancer Research