# Circulating tumor biomarkers for meningiomas (2020-164)

A biomarker panel for early diagnosis of meningiomas with the potential to improve patient outcomes.

Technology No. 2020-164

**IP Status:** Provisional Patent Application Filed; **Application #:** 63/070,010

## Applications

- Early diagnostic approach for meningiomas
- Biomarkers for clinical trials (patient screening and outcome analysis)
- Basic research for meningiomas
- Therapeutic development

## Key Benefits & Differentiators

- **Early and sensitive detection of meningiomas:** Use of a unique biomarker signature to diagnose meningiomas bypasses the requirement for tumors to have grown to increased size for visual scanning approaches.
- **Minimally invasive and cost effective:** Biomarkers can be detected in serum obtained from a simple blood draw.
- **Potential for improved patient outcomes:** Development of a minimally invasive, sensitive and affordable diagnostic tool facilitates broad patient accessibility as well as early and frequent testing.

## Limited diagnostic tools for meningiomas

Although meningiomas account for 53.1% of all non-malignant brain and other CNS tumors, there are no specific biomarkers for early diagnosis or prognosis. Because of this, doctors rely on visual diagnostic approaches that can only detect tumors above a certain size threshold, which delays diagnosis and increases the risk of poor outcomes. Drs. Nurten Saydam and Okay Saydam at the University of Minnesota identified 14 proteins that show consistent differential expression patterns in the blood serum of patients with meningiomas. These biomarkers have the potential to serve as a diagnostic protein signature for meningiomas, facilitating minimally

invasive, early tumor detection.

# Biomarkers for detecting meningiomas

Most CNS tumors are currently diagnosed primarily via radiology-based modalities like CT or MRI scans followed by validation with genetic or IHC-based diagnostic markers. The major challenge with these approaches is that the tumors can be detected only when they reach a certain size, which increases risk to the patient as tumors can mutate over time to malignant forms. This technology encompasses the application of identified biomarker signatures to diagnose meningiomas as well as their transition from benign to malignant forms. When detected early the 10-year survival rate of meningioma patients 20 - 44 years old is 77% and 39% in patients older than 75 years. Therefore, this approach has the potential to facilitate early detection of meningiomas and improve survival rates for patients.

## Phase of Development

**TRL: 2-3**
Detection of 14 differentially expressed proteins in the sera of the Grade I meningioma patients in comparison to the age- and gender-matched control subjects: (increased serum levels of amphiregulin (AREG), CCL24, CD69, prolactin, EGF, HB-EGF, caspase-3, and decreased levels of VEGFD, TGF-a, E-Selectin, BAFF, IL-12, CCL9, and GH).

## Desired Partnerships

This technology is now available for:
- License
- Sponsored research
- Co-development

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## Researchers

- **Nurten Saydam** Senior Scientist, Department of Biochemistry, Molecular Biology and Biophysics
- **Okay Saydam** Assistant Professor, Department of Pediatrics

# References

Erdogan Pekcan Erkan, Thomas Ströbel, Christian Dorfer, Markus Sonntagbauer, Andreas Weinhäusel, Nurten Saydam and Okay Saydam(Oct 2019),
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https://license.umn.edu/product/circulating-tumor-biomarkers-for-meningiomas-2020-164