Invention
The invention is a plasma biomarker for breast cancer, the levels of which correlate closely with disease stage. The marker can be used for less invasive diagnosis of breast cancer and to monitor treatment efficacy.

Background
Breast Cancer is the 2nd leading cause of death for women in the US with 150,000 new cases and 44,000 deaths per year. Diagnosis is currently performed by mammography and clinical examination followed by invasive biopsies. The current diagnostic methods result in many false positive and false negative diagnoses, particularly in women under 50 years old. The currently used serum breast cancer biomarkers CA15.3, CA27.59 and VEGF lack sensitivity for the detection of early stage disease and are not specific. There is a need for more sensitive and specific biomarkers for breast cancer.

CRKL is a soluble protein, part of a group of proteins involved in intracellular signaling for cell migration, invasion and survival. Recent studies have shown that the unphosphorylated form is secreted from cancer cells and can be detected on the cell membrane where it binds to integrin and activates pathways that lead to cell migration and proliferation. High expression of CRKL has been observed in gastric, lung, prostate, hepatocellular carcinoma and breast cancer tumors. The high expression level correlates with high tumor grade, proliferation and in breast cancer with poor prognosis and survival. Researchers at Houston Methodist have discovered that CRKL can be detected in serum and that the levels of CRKL in plasma correlate with disease stage.

Advantages
- Simple, non-invasive blood test.
- More specific and sensitive than current plasma markers for breast cancer.
- Avoids use of invasive biopsies.
- Good correlation between serum protein level and stage of disease.
- Can be used as a diagnostic, particularly for detection of early stage disease.
- Can be used for prognosis.
- Can be used to follow treatment efficacy.

For more information, contact the Office of Technology Transfer by e-mail at OTT@HoustonMethodist.org.

About Houston Methodist
Houston Methodist is comprised of a leading academic medical center in the Texas Medical Center® and four community hospitals serving the greater Houston area. Houston Methodist Hospital, the system's flagship, is consistently listed among U.S. News & World Report's best hospitals and we extend that same level of quality care across the system. Houston Methodist Research Institute is home to some of the world’s brightest physician-scientists, working in a collaborative environment on more than 700 clinical trials. The Research Institute is making strides in the new 440,000-square-foot facility, bringing us even closer to medical breakthroughs in cardiovascular disease, cancer, infectious disease, neurosciences, diabetes and more.

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