

Resolving an uncertain diagnosis of adenocarcinoma favoring gastrointestinal origin

Cancer Care Centers of South Texas, South Texas Medical Center, San Antonio, TX

Initial Diagnosis: Unknown primary adenocarcinoma, gastrointestinal favored

Final Confirmed Diagnosis: Metastatic breast cancer

Initial Staining/Scan History:

- MRI Thoracic and Lumbar spine 9/29/2008 – T10/L3 abnormality
- Mammogram 10/6/08 – benign findings, physical exam of breast normal
- Chest X-ray 10/6/08 – normal
- Bone scan 10/6/08 – abnormality at axial skeleton
- Biopsy source, lower spine 10/21/08
- Magnetic resonance cholangiopancreatography (MRCP) 11/5/08 - normal

Case Summary:

A 45-year-old white female nurse with no family history of breast or ovarian cancers and no smoking history presented at the Cancer Care Centers with lower back pain. An initial evaluation by physical examination was normal. An MRI of the top and lower spine demonstrated lytic lesions suspicious for metastatic disease. Both a mammogram and physical exam of the breasts were normal, as was a chest X-ray. Biopsy of a lesion at the bottom of the patient's spine demonstrated adenocarcinoma favoring gastrointestinal origin. Several weeks later, the oncology team performed an MRCP, which was normal.

The presentation for bone metastasis was unusual for gastrointestinal cancers and the patient's oncologist, Dr. Y. Gia Dice, felt the gastrointestinal diagnosis *"didn't seem right."* Despite the negative physical exam and mammogram, Dr. Dice favored a diagnosis of breast primary. She requested ER/PR/Her2/neu on the bone biopsy and simultaneously ordered a THEROS CancerTYPE ID test to help provide a definitive diagnosis.

"When you have an unknown or uncertain cancer, it's obviously very challenging for both the clinician and the patient to plan," said Dr. Dice. *"I was curious to see how a molecular test could help us get to the bottom of this patient's cancer."* Soon after, the THEROS CancerTYPE ID test results revealed a high confidence prediction for breast cancer. Simultaneously, the receptor stains supported that the patient was estrogen-receptor positive.

With this information in hand, Dr. Dice ordered an MRI, which revealed bilateral breast lesions. *"There is no way insurance would have paid for a bilateral MRI without a mass [evident on a mammogram],"* she said.

"We had a much more positive outcome from this case thanks to the THEROS CancerTYPE ID assay," Dr. Dice said. *"A definitive diagnosis gave this patient a sense of direction and more treatment options. She may be able to live years with the presence of 'bone only' disease. If the primary cancer remains an unknown, neither the patient nor the professional can plan well. Now we know who the enemy is."*



Molecular Diagnostics in Oncology

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Patient & Order Information

Order ID:	
Patient Name:	
DOB:	Sex: Female
Medical Record #:	Site of Biopsy: Bone L2-3
Sample ID:	Date of Collection:
Date Received:	Date Reported:

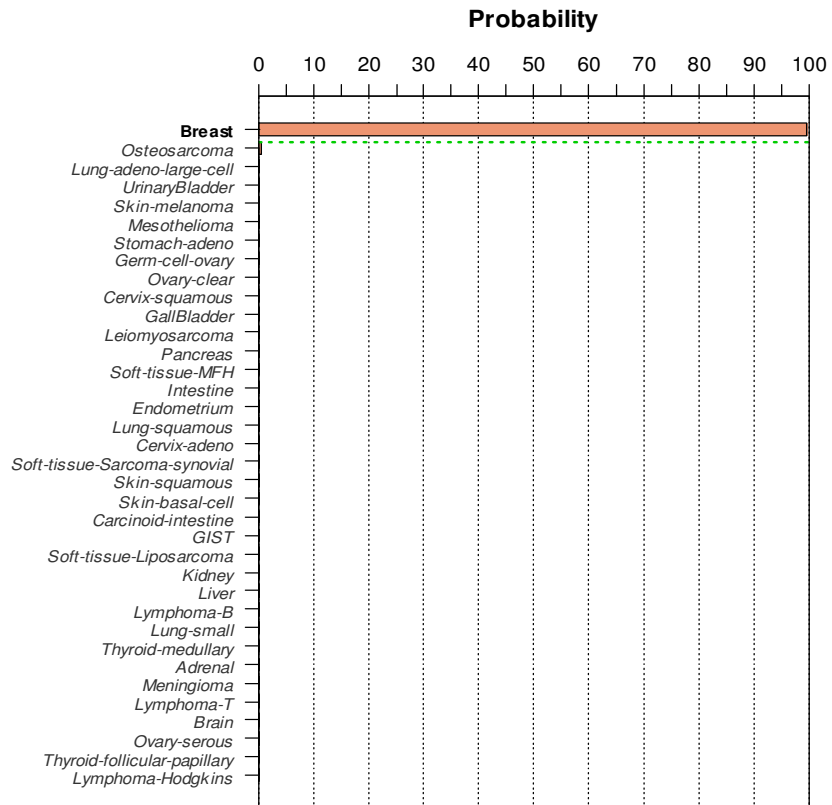
THEROS CancerTYPE ID[®] Molecular Cancer Classification Test

Sample quality:	Sufficient
Microdissection:	No
Cancer Type	Probability
Breast	99.4%

Additional Test Information

The test sample is most similar to the cancer type listed in the table above. The probability is a direct measure of the confidence for the prediction.

How it works. The probability for each cancer type is based on the 92-gene expression profile of the test sample. The probability scores for all cancer types sum to 100%. The cancer type with the highest probability represents the most likely type. When the difference between the highest and the second highest probability is small, the top two or three types are listed as predictions to reach >80% cumulative probability.



Note: cancer types below the horizontal dashed line are ruled out with 95% confidence. Clinical correlation is recommended for cancer types above this line.

Intended Use

THEROS CancerTYPE ID[®] is a molecular test that is recommended to guide the process of cancer classification.

Test Description and Methodology

This test identifies the most likely tumor origin based on the expression profiles of 92 genes analyzed by RT-PCR and is capable of classifying up to 39 tumor classes. The 92-gene expression profile is obtained by extracting mRNA from tumor-enriched sections of formalin-fixed paraffin embedded (FFPE) tissue and performing real-time quantitative RT-PCR using Taqman[™] technology. This RT-PCR based test has been shown to have an accuracy of 86% in classifying 39 cancer types[1,2]. However, cancer types outside of these 39 types may be unclassifiable or potentially misclassified.

1. Ma et al. *Molecular Classification of Human Cancers Using a 92-Gene Real-Time Quantitative Polymerase Chain Reaction Assay. Archives of Pathology and Laboratory Medicine.* 2006;130:465-473
2. Data on File, Technical Report 051909, bioTheragnostics, Inc.

Laboratory Director: Bernard S. Chang, M.D. **CLIA #** 05-D1065725 **CA #** CLF334843

This test was developed and its performance characteristics determined by bioTheragnostics, Inc. It has not been cleared or approved by the U.S. Food and Drug Administration. The FDA has determined that such clearance is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. How this information is used to guide patient care is the responsibility of the physician. This molecular cancer classification predictive testing should be interpreted in the context of additional clinical and/or histopathological findings and not in lieu of such studies.