

CUSTOMER STORY

# Pioneering Personalized Options for Cancer Patients



## EXECUTIVE SUMMARY

When late-stage cancer patients don't respond to the most common therapies, they need new treatment options. Dr. Luminita Castillos, a researcher, and her husband, an oncologist, have a specialty oncology practice focused on finding new options for those patients, and have used Pathway Studio to help understand each patient's unique disease.

When late-stage cancer fails to respond to the “standard of care” treatments, oncologists have historically had little choice but to recommend hospice care for their patients. But new approaches to identifying non-standard therapies for individual cancers are presenting patients and practitioners with more options and hope.

A small oncology practice in Winston-Salem, North Carolina, is among the pioneers offering such personalized cancer treatments to late-stage patients. Personalized Hematology-Oncology of Wake Forest, PLLC, operated by Luminita Castillos, a PhD molecular biology researcher, and her husband Francisco Castillos MD, an oncologist, applies pathway analysis to patients’ gene expression profiles in order to design targeted treatments for each patient’s unique disease.

With more than 15 years of experience in gene expression profiling and cancer microscopy at cancer research centers and the biotech industry, Luminita Castillos oversees lab operations for the practice that she and Francisco started in July 2012. “Our idea was to create a niche that separates us from regular oncology practices,” she says. She relies on an independent, CLIA-certified clinical laboratory to generate expression data from patient tissue samples using the Affymetrix GeneChip and then uses Elsevier’s Pathway Studio in-house to interpret the results, mapping up- and down-regulated genes to the biological

pathways that might be involved in their cancers. Those pathways can point Dr. Castillos to off-label uses for existing approved drugs or to potentially promising clinical trials.

The innovative approach has already altered the prognoses of several late-stage cancer patients. At the Second International Conference on Predictive, Preventative, and Personalized Medicine & Molecular Diagnostics in 2014, Dr. Castillos presented preliminary evidence for three patients who have responded positively to therapies that her husband prescribed based on her analyses of each patient’s cancer expression profile:

- A 66 year-old female with poorly differentiated hepatocellular carcinoma who entered a clinical trial with Vorinostat and Sorafanib is in remission and remains in the trial.
- A 68 year-old female with recurring stage IV breast cancer with lung and brain metastases who was prescribed Gemcitabine and Avastin combined with radiation now has no sign of disease.
- A 74 year-old male with reoccurring stage IV colon cancer with liver and lung metastases who was treated with multiple rounds of Dexamethazone + FOLFOX decided against additional chemotherapy in August 2014.

All three patients had been given very grim chances of survival by their caregivers at major hospitals and came to Personalized Hematology-Oncology of Wake Forest as a last resort, Castillos says. “We believe that in patients with metastasis, or for those who have

exhausted all the treatment options, gene expression profiling changes the working diagnosis and management for the majority of patients,” she says. As for earlier stage patients, Castillos says, “We have a vision for how cancer will be treated 10 years from now.”

**For details on how Castillos worked with Elsevier researchers and the Pathway Studio database to zero in on each patient’s cancer, see our [Use Case: Understanding Cancer Processes in Pathway Studio](#).**

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