the trial, with a median response duration exceeding 11 months.[46] The treatment also shrank brain metastases in close to 60% of patients. Serious treatment-related adverse effects, such as dyspnea and pulmonary embolism, occurred in 27% of patients.

In June 2013, the FDA granted alectinib a breakthrough therapy designation. In 2014, alectinib was approved in Japan for the treatment of advanced or recurrent *ALK*-positive NSCLC. In December 2015, the FDA granted accelerated approval to alectinib for the treatment of patients with metastatic *ALK*-positive NSCLC that has worsened after, or who could not tolerate crizotinib.[47] However, larger studies are needed to confirm the efficacy of alectinib.

Meanwhile, many other ALK inhibitors that seem more potent than crizotinib or are active in crizotinib-resistant tumors are already in clinical trials.[48] Emerging research findings suggest that patients with lung cancers driven by uncommon genetic abnormalities can also benefit from targeted therapies.

In another early clinical trial, crizotinib shrank tumors of 72% of patients with *ROS1* gene rearrangements (this study was funded in part by a grant from the NIH).[49] The median duration of response was more than 17 months. *ROS1* rearrangement is found in only 1% of tumors of patients with NSCLC.

The most common treatment-related toxicities were visual impairment, diarrhea, and nausea. However, nearly all of the reported adverse effects were mild.

Approximately 28% of patients with similarly uncommon *RET* gene rearrangements responded to the targeted drug cabozantinib, which was previously approved by the FDA for the treatment of thyroid cancer.[50] The median time to progression of advanced NSCLC was 7 months. Toxicities were mostly mild and included fatigue, diarrhea, hand-foot syndrome, and low platelets.

Preliminary results from a small trial suggest that the targeted drug dabrafenib is active against advanced NSCLCs harboring a specific mutation in the *BRAF* gene, V600E.[51] The treatment shrank tumors in 63% of the patients, and treatment-related adverse effects were mostly mild. The most common toxicities were fever, diarrhea, nausea, and vomiting. Dabrafenib is approved for the treatment of melanoma with the same mutation.

Finally, a large genomic profiling study identified a rare new subgroup of patients with NSCLC who could potentially respond to targeted MET inhibitors.[52]

Although *ALK*, *ROS1*, *RET*, and *BRAF* mutations are rare in frequency, given the high incidence of NSCLC, thousands of people may be candidates for the new targeted therapies. Further research is needed to determine the best way to screen patients for rare genetic changes.

IN THEIR OWN WORDS

WANDA LUCAS, MBA

My experience with breast cancer has been full of emotions. Like so many others, I was in shock with the news of my diagnosis.

During my treatment, I agreed to participate in a couple of epidemiological studies and the Suppression of Ovarian Function Trial (SOFT). I recognized that treatment choices that were available to me in 2006 were the result of someone agreeing to participate in a trial, at another point in time. In my mind, saying "yes" was an opportunity to make a difference in the lives of others who may be facing a similar diagnosis.

Many patients are simply never asked to participate. Earlier this year, I was in a room with more than 60 African American women who had been diagnosed with breast cancer. When asked how many people had been approached about participating in a clinical trial, only five of us raised our hands. That's unsettling because we were in Washington, DC, which is home to four cancer centers!

My work in advocacy has led me to believe that a better allocation of research funding coupled with more effective research direction is needed. Far too often, many young researchers are not valued or rewarded for their capabilities or potential impact on the progress of cancer research. As a result, many of these brilliant minds are abandoning academic research centers, leaving us with gaps in necessary research, knowledge and breakthroughs.

Funding vehicles should require collaborations, provide incentives for groundbreaking research and foster paradigm shifts. We need programs, such as the Department of Defense Breast Cancer Research Program, that recognize and reward innovative research ideas, particularly those that focus on prevention and stopping metastasis. It is time to stop this disease in its tracks!

Wanda is a 10-year breast cancer survivor and is a founding member of Georgetown Breast Cancer Advocates, a member of the Board of Directors of the National Breast Cancer Coalition and Annie Appleseed Project. See page 22 to learn about the SOFT study Wanda participated in.