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Serum HER2 as a biomarker to monitor breast cancer patients for treatments

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Abstract

Over-expression of the HER2/neu receptor occurs in 15 to 30 percent of breast tumors and is linked to poorer prognosis. Currently HER2/neu expression status determines whether patient will receive trastuzumab- based treatment. In clinical practice, over-expression of HER2/neu is identified using IHC or FISH, both of which are invasive approaches requiring tissue samples. Serum assays for HER2/neu receptor have been reported but the use is very limited due to serum interference factors (e.g. human anti-animal antibodies) that lead to false test results and inconsistency with tissue Her2 status. We have developed an ELISA based approach implementing an MBB buffer to eliminate false results and to obtain more accurate assessment of HER2/neu levels. Using this refined assay we retroactively measured HER2/neu levels from 56 patients. Pre-treatment (e.g. surgery, radiation, or chemotherapy) samples were available from 12 patients, of which 6 patients were tissue HER2/neu positive and the other six were negative. All the HER2/neu positive samples had higher serum levels than negative ones ($p < 0.05$). We observed a decrease in serum HER-2/neu values after surgery in two out of 5 patients. In 5 patients experienced recurrence or metastasis, HER2/neu level significantly increased from the treatment-established baseline, accompanying recurrence and before metastasis. Our results indicate that we can monitor HER2 ECD as a biomarker over the course of disease progression and treatment.

Biography

Hongtao Zhang has been a Research Assistant Professor in the Department of Pathology and Laboratory Medicine at the University of Pennsylvania Perelman School of Medicine since 2007. He graduated from University of Pennsylvania in 1999 with a Ph.D. degree in Pharmacology. Currently he focuses on the ErbB receptor- targeted therapies using antibodies, antibody-like proteins, or small molecules. He is also devoted to the identification of serum biomarkers that can help the diagnosis and provide therapeutic guidance for breast cancer and melanoma. He has published more than 50 papers and serves as an editorial board member for several journals.