Medical Xpress

Two-hit therapy for breast tumors using approved drugs looks promising in animal study

October 7 2015

Disabling a cancer-causing pathway and administering an immune-molecule-based mop-up therapy eradicated a specific type of breast tumor in mice, according to researchers in the Perelman School of Medicine at the University of Pennsylvania. They describe their findings in *Cell Reports*.

"This line of research is important to future therapy for Her2-positive breast cancers because it defines a way to make the current treatment better and to use less amount of cancer drugs such as Herceptin by an ordered combination use with before interferon-gamma, which is also a clinically used drug," said coauthor Hongtao Zhang, PhD, a research assistant professor of Pathology and Laboratory Medicine. Anti-erbB2/neu monoclonal antibodies (mAbs) alone are only effective in 30 percent of breast cancer patients carrying the amplified target and cost about $100,000 a year. Currently, this antibody treatment must be combined with chemotherapy to increase the proportion of patients it helps.

The major take-away from this study is that treatment with herceptin or lapatanib followed by interferon-gamma dramatically improves tumor eradication in the mice, said senior author Mark Greene, MD, PhD, the John W. Eckman Professor of Medical Science. This one-two punch, which is a continuation of the pioneered antibody based Her-2 targeted therapy from this lab, renders the tumors highly sensitive to

chemotherapy, which is needed to make the targeted therapy work.

This therapy, when translated for use in people humans, would be beneficial in reducing toxicity because the amount of antibody could be decreased by two-thirds and the amount of chemotherapy by at least half. This in turn, "reduces the cost of treatment so that individuals previously not able to afford targeted therapy will be able to do so. All of the therapeutic agents used in this preclinical study are approved and we expect to try ordered therapy plus interferon in clinical trials soon," Greene said.

"We examined the biologic effects of interferon-gamma alone or after anti-erbB2/neu antibody treatment of erbB2-positive cells and mice," said co-first author Yasuhiro Nagai, PhD, a postdoctoral fellow in the department of Pathology and Laboratory Medicine.

Interferon-gamma is a small protein called a cytokine normally produced by T cells as part of the immune response. Interferon-gamma is a well-known cytokine to immunologists but is not used by oncologists so much because of other side effects. Interferon-gamma works by rendering the tumor cells much more susceptible to Her-2 inhibitors so that tumor cells can be killed more effectively. In addition, this combination therapy also augments host tumor immunity, which can be a good advantage for this therapy.

In a series of experiments in breast cancer cell lines and transgenic mice that develop breast cancer as adults, the team found that interferon-gamma on its own had no effect on tumors. Treatment of the tumors with anti-erbB2/neu mAbs followed by interferon-gamma led to a considerable inhibition of tumor growth and reduction of tumor size in the mice when the therapy is combined with a typical chemotherapeutic agent.

Medical Xpress

Provided by University of Pennsylvania School of Medicine

Citation: Two-hit therapy for breast tumors using approved drugs looks promising in animal study (2015, October 7) retrieved 2 May 2024 from https://medicalxpress.com/news/2015-10-two-hit-therapy-breast-tumors-drugs.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.