

Red Wine Compound Increases Anti-Tumor Effect of Rapamycin

Feb. 14, 2011 — Researchers from Cleveland Clinic's Lerner Research Institute have discovered that resveratrol -- a compound found in red wine -- when combined with rapamycin can have a tumor-suppressing effect on breast cancer cells that are resistant to rapamycin alone.

The research -- recently published in *Cancer Letters* -- also indicates that the PTEN tumor-suppressing gene contributes to resveratrol's anti-tumor effects in this treatment combination.

Charis Eng, MD, Ph.D., Chair of the Genomic Medicine Institute of Cleveland Clinic's Lerner Research Institute, led her team to study the effect of combining resveratrol, a chemopreventive drug found in many natural compounds, with rapamycin on breast cancer cells. The research demonstrates an additive effect between these two drugs on breast cancer cell signaling and growth.

"Rapamycin has been used in clinical trials as a cancer treatment.

Unfortunately, after a while, the cancer cells develop resistance to rapamycin," Eng said. "Our findings show that resveratrol seems to mitigate rapamycin-induced drug resistance in breast cancers, at least in the laboratory. If these observations hold true in the clinic setting, then enjoying a glass of red wine or eating a bowl of boiled peanuts -- which has a higher resveratrol content than red wine -- before rapamycin treatment for cancer might be a prudent approach."

Rapamycin, an immunosuppressant drug used to prevent rejection in organ transplantation, has been considered for the use of anti-tumor activity against breast cancer. Resveratrol is a type of polyphenol that is found in the skin of red grapes and is a constituent of red wine, and has been considered for multiple uses regarding cellular therapies.

Despite the potential for tumor suppression, rapamycin's efficacy with respect to growth inhibition differs markedly among various breast cancer cell lines.

The effect of resveratrol and rapamycin, alone and in combination, on cell growth of three human breast cancer cell lines was assessed. Rapamycin, resveratrol, and combinations of these agents inhibited cell growth in a dose-dependent manner. In all three cell lines tested, the presence of low concentrations of resveratrol and rapamycin was sufficient to induce 50 percent growth inhibition. Although relatively early, these observations may suggest resveratrol as a powerful integrative medicine adjunct to traditional chemotherapy.

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