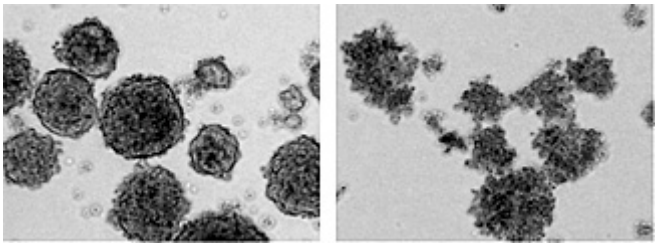
Statins May Enhance Chemotherapy's Potency

By Christina Johnson | March 25, 2014

If experiments in mice are any indication, a common cholesterol-lowering statin drug may offer a glimmer of hope for a grim form of brain cancer known as glioblastoma.

In a recently published paper in the *Journal of Translational Medicine*, Pengfei Jiang, PhD, a postdoctoral researcher at the UC San Diego Moores Cancer Center, and colleagues have shown that adding a statin to a standard chemotherapy treatment significantly diminished the size and growth of tumors in mice.

Notably, the benefits could be reaped at much lower doses and thus with fewer side effects. Mice administered the statin in conjunction with the chemotherapy drug did not suffer weight loss.



Cultured brain cancer cells before (left) and after treatment with a novel drug combination (right).

In in vitro studies, the drug combination also increased the number of cancer cells destroyed by the chemotherapy treatment 40- to 70-fold, depending on the particular cancer cell line exposed to the drug combination.

Perhaps as promisingly, both the statin (pitavastatin) tested in the experiments and the chemotherapeutic (irinotecan) already have FDA approval, meaning that a combo therapy could potentially become available much earlier, and at a fraction of the cost.

"Our results highlight the potential ability to identify and accelerate drug development by intelligently combining drugs that are already on the market," Jiang said.

Any advance for glioblastoma treatments would be welcome. Most patients with the rare but lethal disease succumb within one to two years of being diagnosed. Median survival without treatment is 4.5 months. An estimated 10,000 Americans die from complications of glioblastomas annually.

The mechanism by which the statin enhances the potency of the chemotherapy is not completely understood, but cholesterol is a building block of cell membranes and plays key roles in cell

signaling and metabolism. Like healthy cells, cancer cells need cholesterol to grow.

"When a tumor is deprived of cholesterol, we think it is being deprived of the raw materials it needs to divide and make new cancer cells," explained Santosh Kesari, MD, PhD, director of neuro-oncology at UC San Diego Moores Cancer Center and a study co-author.

The cholesterol-starving effect of statins also seems to help prevent "multi-drug resistance," in which cancer cells learn to recognize and avoid the effects of therapeutic chemical agents.

Kesari and his team are attempting to optimize the dosing of the drug combination and characterize its efficacy in advance of what they hope will begin clinical trials in the near future.

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