

# New platinum-phosphate compounds kill ovarian cancer cells

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A new class of compounds called phosphaplatins can effectively kill ovarian, testicular, head and neck cancer cells with potentially less toxicity than conventional drugs, according to a new study published this week in the journal *Proceedings of the National Academy of Sciences*.

The compounds could be less harmful than current cancer treatments on the market such as cisplatin and carboplatin because they don't penetrate the cell nucleus and attach to DNA, said lead author Rathindra Bose. Conventional drugs can interfere with the functions of the cell's enzymes, which lead to side effects such as hearing and hair loss and kidney dysfunction.

Though scientists don't fully understand the mechanism by which the phosphaplatins kill cancer cells, they suspect that the compounds bind to the cell surface membrane proteins and transmit a "death signal" to the interior of the cell, Bose said. The compounds are created by attaching platinum to a phosphate ligand, which can readily anchor to the cell membrane. Future studies will focus on identifying the exact process.

"The findings suggest a paradigm shift in potential molecular targets for platinum anticancer drugs and in their strategic development," said Bose, a professor of biomedical sciences and chemistry and vice president for research at Ohio University who conducted the work while at Northern Illinois University.

The first drug developed for the treatment of ovarian and testicular

cancers, cisplatin, was approved for use in 1982. Though it's 95 percent effective, it works best during the early stages of the disease, and some patients develop a resistance to it. Two drugs introduced later, carboplatin and oxaliplatin (which is used for colorectal cancer), overcame some of those problems, but their potency can harm the immune system of patients, said Bose, who has been studying alternative compounds and targets for these cancers for 25 years.

Phosphaplatins have the potential to be more efficient, more targeted and create fewer side effects in the patient, Bose said. The new study shows that the phosphaplatins can kill ovarian cells at half of the dosage of conventional drugs, but are just as potent. Unlike cisplatin, which can decompose quickly and create additional toxic side effects through the decomposition products, the new compounds show no signs of degradation after seven days, he added.

A U.S. patent is pending on the work; two provisional patents have been filed. Bose and his colleagues next will test the compounds in mice models.

Source: Ohio University

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