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Diamond-studded drug patch may help in cancer care

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CHICAGO - A new drug patch material studded with tiny specks of diamonds may one day allow cancer patients to get chemotherapy just where they need it, U.S. researchers said on Thursday.

The flexible microfilm, which looks something like plastic wrap, is embedded with tiny bits of diamonds that can release a common chemotherapy drug slowly over time, limiting exposure to the drug's toxic side effects.

"The thin device -- a sort of blanket or patch -- could be used to treat a localized region where residual cancer cells might remain after a tumor is removed," Dean Ho of Northwestern University, whose research appears in the journal ACS Nano, said in a statement.

The material is made of nanodiamonds, fragments of diamond dust comprised of only a few clusters of carbon atoms. Clusters of nanodiamonds have a high surface area that makes them ideal for carrying drugs.

Ho's team sandwiched nanodiamonds embedded with the chemotherapy drug doxorubicin between layers of thin films of a polymer called parylene to form the patch material.

Then they tested it to see how well it released drugs over time. They found the drug released slowly and evenly for a month, with doxorubicin to spare.

Because of their small size, the researchers said nanodiamonds are compatible with tissues in the body. Prior studies in Ho's lab found they do not cause inflammation in cells. And they can be produced in large quantities.

"The nanodiamonds are quite economical and have already been mass-produced as lubrication components for automobiles and for use in electronics," said Robert Lam, a graduate student in Ho's lab who led the study.

The team hopes this diamond-studded technology can be used to complement injected chemotherapy to reduce dosages and decrease its side effects.

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