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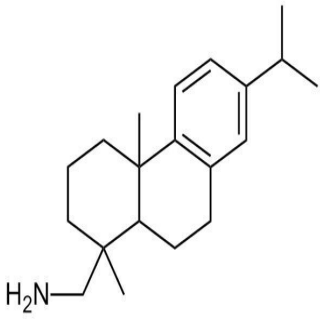
Nanoparticle May Spur Leelamine Clinical Testing In Humans



A team of researchers at Penn State College of Medicine have developed a nanoparticle that can deliver a melanoma-fighting drug, leelamine, directly to cancer cells. The results of the research have been reported in *Molecular Cancer Therapeutics*.

This is an important development since delivering cancer drugs directly to the tumours is quite difficult. Scientists have been working on identifying new approaches that could help overcome the limitations of drugs and one such approach is loading the drug into nanoparticles.

According to Gavin Robertson, Director of the Penn State Hershey Melanoma Center and Professor of Pharmacology, Pathology, Dermatology and Surgery, "The drug is packaged into a lipid ball significantly smaller than the width of a hair to make it soluble in the blood stream and prevent negative side effects. The drug-containing nanoparticle ball then travels in the bloodstream to the tumour, where it accumulates and the drug is released in the tumour to kill the cancer cells."

Robertson had already discovered the cancer-fighting characteristics of leelamine in previous research. Leelamine is the first of a new class of drug that can inhibit the movement of cholesterol around a cancer cell and can shut down signals that cancer cells need to survive. However, leelamine cannot be given by mouth because of its poor uptake in the GI tract. It is also not possible to give leelamine intravenously as it can cause damage to red blood cells.

That is why Robertson and his team developed a nanoliposome that loads leelamine. The nanoliposome is called Nanolipolee-007 and it can be injected intravenously without any damage to red blood cells. Nanolipolee-007 accumulates in the tumours where it releases the drug that can kill cancer cells. When given to mice through intravenous injection, the researchers found that leelamine inhibited tumour development without any detectable side effects.

With this new development, the researchers believe that leelamine is now one step closer to the clinic. It has not been possible to give it to humans before but through this nanoparticle, this hurdle could be crossed. Penn State has already patented this discovery and has licensed it to Melanovus Oncology, partly owned by Penn State and Robertson. However, the FDA requires more research before the drug can be tested in humans.

The research team also included Raghavendra Gowda, SubbaRao V. Madhunapantula, Omer F. Kuzu and Arati Sharma and the research was funded by the National Institutes of Health, The Foreman Foundation for Melanoma Research and the H.G. Barsumian, MD Memorial Fund.

Source: Newswise

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