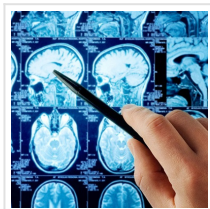


## New Platinum-based Nano-drugs Can Combat Glioblastoma Drug Resistance



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Glioblastoma (GBM) is the most common and deadly brain tumor in adults. At present, temozolomide (TMZ) is its first-line anticancer drug, but people have been plagued by its drug resistance. A group of researchers developed a platinum-based nanodrug to tackle TMZ resistance on mouse models.

It is known that the acquired mismatch repair defects and overexpression of O6-methylguanine-DNA-methyltransferase (MGMT) are involved in the TMZ resistance. It is urgent to find new treatment options and drugs with different action mechanisms.

In a study published in [Nature Biomedical Engineering](#), the research group led by Prof. XIAO Haihua from the Institute of Chemistry of the Chinese Academy of Sciences ([CAS](#)) and Prof. Mark W. Saltzman from School of Engineering and Applied Sciences at [Yale University](#) developed a platinum-based nanodrug to tackle TMZ resistance on mouse model.

The researchers first designed a reduction-responsive biodegradable polymer to encapsulate a platinum(IV) prodrug of oxaliplatin and a platinum(II) DNA intercalator 56MESS separately to form two nanoparticles. They established TMZ-resistant patient-derived glioma primary cells and an acquired drug-resistant transgenic engineered glioma cell line to screen these two platinum-based nanoparticles in vitro, and found that both of them can reverse TMZ resistance.

Then, the researchers developed a TMZ-resistant patient-derived xenograft mouse model of GMB in vivo. With the help of advanced convection-enhanced delivery technology (CED), these nanoparticles were able to directly deliver the drugs to the target brain area for bypassing the blood-brain barrier in mice. They found that nanoparticles loaded with the DNA intercalator 56MESS can work better to inhibit the growth of drug-resistant GMB tumors and

prolong their survival rate.

Finally, through RNA-sequencing, the researchers found that the signal transduction and metabolic pathways altered by 56MESS-based nanoparticles are quite different from those of TMZ, confirming the unique mechanism of action.

This study provides a new perspective to treat resistant GBM.

Read the [original article](#) on Chinese Academy of Sciences (CAS).