

# Gold nanoparticles help deliver lethal one-two punch to cancer

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Tagging gold nanoparticles with a small dose of radiation has helped researchers trace the precious metal as it delivers a drug right into the heart of cancer cells, according to new laboratory research being presented at the 2016 National Cancer Research Institute (NCRI) Cancer conference.

Researchers from the CRUK/MRC Oxford Institute for Radiation Oncology have been working on better ways to transport a drug directly into the control room of [cancer cells](#), where the chromosomes are kept. This specific drug targets a molecule - telomerase - that builds up the protective caps at the end of chromosomes called telomeres.

In most cells of the body, telomeres act like an in-built timer to ensure that the cell does not live past its expiry date. Telomeres shorten each time the cell divides. Once a critical length is reached, the cell can no longer divide and it dies. Cancer cells manage to get around this safety check by reactivating telomerase allowing them to continue to grow out of control.

One of the biggest hurdles in treating cancer is getting effective drugs into cancer cells, particularly to where the chromosomes are stored. Gold nanoparticles have proven to be well suited to being absorbed into cells, safely delivering drugs that could otherwise be blocked.

By engineering the gold nanoparticles and adding the [radioactive tracer](#), the researchers were able to prove that their drug was reaching the

desired target in skin cancer cells grown in the lab and was shutting telomerase down, halting cancer's growth.

While the radioactive tracer was used to precisely follow the drug in this study, the same method can also be used to deliver a dose of radioactivity to cancer cells, helping to kill them. This second dose is especially powerful because inactivation of telomerase makes cancer cells more sensitive to radiation.

Professor Kate Vallis, lead researcher based at the CRUK/MRC Oxford Institute for Radiation Oncology, said: "Gold is precious in more than one way. We have used tiny [gold nanoparticles](#) loaded with targeted drugs to kill cancer cells in the laboratory. Our long term goal is to design new treatments for cancer patients based on this promising approach."

Sir Harpal Kumar, Cancer Research UK's chief executive, said: "Gold has been used in medicine for many years and this research adds further insight into its potential. Ensuring that treatment is accurately targeted at cancer and avoids healthy cells is the goal for much of cancer research, and this is an exciting step towards that."

Dr Karen Kennedy, Director of the NCRI, said: "Research continues to shed light on how cancer cells behave and how to effectively deliver a lethal payload to the tumour. This exciting research offers that potential and needs further investigation to see how it would be used in patients. The future looks exciting with research such as this improving the way the disease is treated."

**More information:** [abstracts.ncri.org.uk/abstract ... se-positive-tumours/](https://abstracts.ncri.org.uk/abstract...se-positive-tumours/)

Provided by Cancer Research UK

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