Researchers create new cancer fighting compound

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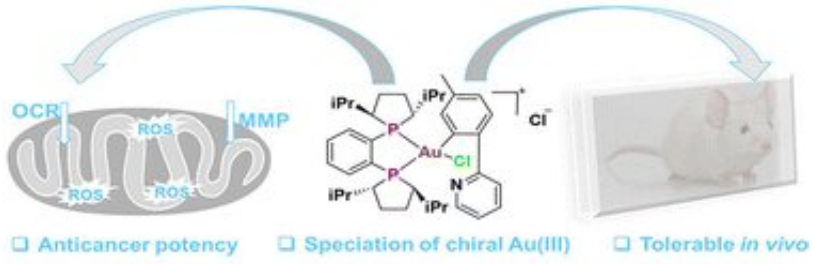

Graphical abstract. Credit: *Chemical Communications* (2022). DOI: 10.1039/D2CC03081K

A University of Kentucky Markey Cancer Center researcher's team developed new chemical compounds that show promise as a potential anticancer therapy to treat aggressive tumors.

The study led by Samuel G. Awuah, Ph.D., was published in *Chemical Communications* with Adedamola Arojojoye, a graduate student in Awuah's lab as the paper's first author.

The new gold-derived compounds created by Awuah's lab were toxic to cancer cells but well-tolerated by mice, giving them potential in the development of new cancer drugs that could make it to the clinic.

Many metal-based therapies have proven to be effective against cancer, with platinum-based drugs a first line chemotherapy for testicular,

bladder, lung, colon and ovarian cancers. Some metal-based compounds, like gold(III), have promise as anticancer agents, but lack the stability needed to continue therapeutic development.

Awuah's lab synthesized a new class of gold(III), which had a different structure that was more tolerant to therapeutic use.

In the lab, the new chiral gold(III) compounds were studied on a panel of cancer cell lines to test their effectiveness and understand how they attack cancer cells.

The compounds showed anticancer activity against aggressive triple negative breast cancer cells. They also possessed a new mechanism that caused the cells' mitochondria to dysfunction.

Awuah says developing drugs that cause mitochondria dysfunction deprive cancer cells of energy and is a new relevant strategy to inhibit cancer growth that would be useful in combination with existing therapies.

"Continuing to develop gold-based compounds has the potential to generate new mechanisms of drug action and understanding how they alter cancer cells has significant implications in drug design and is of clinical relevance," Awuah said.

Awuah is an assistant professor in the College of Arts and Sciences' Department of Chemistry and holds a joint appointment in the College of Pharmacy's Department of Pharmaceutical Sciences. His lab focuses on developing new methods to create chemical tools that interrogate complex biological processes as therapeutics for several diseases, including cancer.

More information: Adedamola S. Arojojoye et al, Chiral gold(iii)

complexes: speciation, in vitro, and in vivo anticancer profile, *Chemical Communications* (2022). DOI: 10.1039/D2CC03081K