Diabetes drug metformin inhibits multidrug-resistant breast cancer

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The drug metformin, typically prescribed to treat type 2 diabetes, keeps breast cancer cells from developing multiple drug resistance (MDR) and can reverse MDR after it¹s appeared, according to a study published December 6, 2017 in the open-access journal *PLOS ONE* by Terra Arnason from the University of Saskatchewan, Canada, and colleagues.

Previous studies have shown that metformin has some antiproliferative activity against multiple types of cancer cells. Moreover, clinical meta-analysis studies on cancer patients who already take metformin to treat diabetes have hinted that the drug may boost their survival and prevent the emergence of new tumors.

Arnason and colleagues probed the effect of metformin on the widely studied breast cancer cell line MCF7. Metformin, they found, had an antiproliferative effect on MCF7, including cells that were resistant to the common chemotherapeutic Doxorubicin. When cells were pretreated with metformin, the development of drug resistance was prevented or delayed. In addition, experiments conducted in both cell cultures and mouse models of aggressive breast cancer revealed that metformin reversed protein markers associated with MDR after its onset.

These findings establish that metformin has the potential to both reverse MDR in cell lines and prevent its onset. Future research will need to extend the timeline of the study to follow cancer cells for many months and determine if the effect of metformin is permanent or short-lived.

More information: Gerald Davies et al, Metformin inhibits the development, and promotes the resensitization, of treatment-resistant breast cancer, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0187191

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