

# Researchers find potential new leukemia treatment with old antibiotic drug

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Clinician-scientists in the Princess Margaret Cancer Program have found a promising approach to treating leukemia, using an old drug in a new way.

The proof-of-concept research published today in *Cancer Cell* describes how the Canadian team discovered that the antibiotic tigecycline targets and destroys leukemia [stem cells](#) by cutting off the cell's energy production.

"If you think of all the cells in the body as a [power grid](#), we've discovered that tigecycline can cause a [power outage](#) in leukemia stem cells, while still keeping the lights on in all the healthy cells," says Dr. Aaron Schimmer, clinician-scientist at the Campbell Family Institute for [Cancer Research](#) in the Princess Margaret Cancer Program, University Health Network. He is also an associate professor in the departments of medicine, medical biophysics, and Institute of Medical Science at the University of Toronto (U of T).

To identify known drugs with previously unrecognized ability to kill [leukemia cells](#) and leukemia stem cells, the scientific team amassed a library of hundreds of known drugs to try, including tigecycline – an intravenous antibiotic normally used to treat skin and abdominal infections. A high-speed, pipette-handling robot tested varying doses of each drug to see if any affected leukemia cells.

"Technology made this discovery possible. In three days, we found

which potential leukemia drugs might be hiding in plain sight," says Dr. Schimmer. "Sifting through every combination by hand would have taken months."

"We tested more than 500 existing drugs on leukemia. Of the handful that made an impact, tigecycline was the most potent and revealed novel insights into the biology of leukemia at a cellular level," says lead author, Marko Škrtić, an MD/PhD student in the Faculty of Medicine at U of T, completing his PhD studies in Dr. Schimmer's lab.

The Canadian team demonstrated that leukemia cells have unique energy requirements and it is possible to selectively shut down this [energy production](#) in leukemia cells by blocking protein synthesis in the mitochondria.

By looking for new treatments in approved drugs, cancer researchers may be able to rapidly test these new strategies in patients, says Dr. Schimmer, who is now beginning multi-centre clinical trials with tigecycline as a treatment for leukemia.

**More information:** [DOI:10.1016/j.ccr.2011.10.015](https://doi.org/10.1016/j.ccr.2011.10.015)

Provided by University Health Network

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