Clarithromycin as an anti-cancer agent

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An antibiotic may join the ranks of drugs suitable for repurposing as anti-cancer treatments, according to new research from the Repurposing Drugs in Oncology (ReDO) project published in *ecancermedicalscience*.

Clarithromycin is a very common and effective antibiotic. It is traditionally used for many types of bacterial infections, treatment of Lyme disease and eradication of gastric infection with *Helicobacter pylori*. It is noted in the World Health Organisation's list of essential medicines, ensuring it will remain available worldwide at low cost. Dr. Vikas P. Sukhatme of the ReDO project and GlobalCures says "The multiple mechanisms of action of this drug make it particularly attractive for repurposing."

"Clarithromycin is a canonical example of a drug that may have limited antitumor activity on its own, but is extremely valuable against cancer in combination with other drugs," says An Van Nuffel, PhD, lead author of the paper and member of the ReDo project and the Anticancer Fund.

An international collaboration between anticancer researchers from across the world, the ReDO project is dedicated to promoting the cause of common medicines which may represent an untapped source of novel therapies for cancer.

In partnership with ecancer, the ReDO project is publishing a series of papers on drugs with enough evidence to be taken to clinical trials. Future papers will address the potential anti-cancer uses of nitroglycerin, itraconazole and diclofenac.

Dr Gauthier Bouche of the ReDO project and the Anticancer Fund describes a serendipitous use of clarithromycin for the treatment of chronic myeloid leukaemia (CML).

In 2012, Italian doctors led by Dr Carella prescribed clarithromycin for an infection in a patient with CML. The patient had developed resistance to his treatment, which reversed after treatment with clarithromycin, reinstalled when the drug was discontinued and then reversed again after re-challenge.

Low- and middle-income countries (LMIC) may pave the way for drug repurposing. The latest randomised trial done with clarithromycin was done in Egypt, demonstrating that patients with a certain form of lymphoma lived longer when clarithromycin was added to chemotherapy.

The faster development of new - but expensive - drugs in High Income Countries may create a role for LMIC to further develop drug repurposing in oncology. Could LMIC with no access to the recent drugs perform trials with clarithromycin?

"If clarithromycin were a new drug with the anticancer potential that it has, we would see companies pushing hard for clinical trials and aiming to get to market quickly," says Pan Pantziarka, PhD, member of the ReDO project and the Anticancer Fund. "Why isn't that happening now in multiple myeloma or resistant leukaemias?"

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