

UCLouvain research

World first: drug prevents human breast cancer recurrence and metastasis

SYNOPSIS:

- Scientists at University of Louvain (UCLouvain) have succeeded in **preventing the recurrence and spreading of a human breast cancer in mice**, in conditions very similar to clinical practice, thanks to a new **drug** (the molecule MitoQ)
- **What next?** MitoQ has already been tested in people during an initial clinical phase and its toxicity is slight. Phase 2 and 3 tests are expected shortly.
- This highly promising **world first**, published in the scientific journal *Cancers*, shows that relapses and metastases, the main causes of cancer mortality, can be prevented more effectively.

PRESS KIT:

[HTTPS://DRIVE.GOOGLE.COM/DRIVE/FOLDERS/1IL6WWXOLCXAD9MZF9UYM5NFG_LRL_I8F0?USP=SHARING](https://drive.google.com/drive/folders/1IL6WWXOLCXAD9MZF9UYM5NFG_LRL_I8F0?USP=SHARING)

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Even when detected early, some cancers are more aggressive and more fatal than others. This is the case, for example, with **triple negative breast cancer** which accounts for **10 to 15% of all breast cancers**. This cancer affects 1,000 patients per year in Belgium, while the figure worldwide is 225,000. Around **half of the patients** will develop **local recurrences** and **metastases**, regardless of the treatment they receive. **No specific treatment is currently** capable of preventing these two events. Patients suffering from pervasive triple negative breast cancer have only a one-in-ten chance of a cure.

In 2014, Pierre Sonveaux, a researcher at the University of Louvain (UCLouvain) Institute for experimental and clinical research, succeeded in demonstrating the principle that it was possible to prevent the appearance of melanoma tumour metastases in mice. However, the experimental molecules used at the time were far from being drugs.

Since then, the UCLouvain researcher and his team, including post-doctoral researcher Tania Capeloa, have continued their work thanks in particular to sponsorship obtained by the UCLouvain Foundation. They have now succeeded in establishing that a drug developed for diseases other than cancer, **MitoQ, avoids the appearance of metastases in 80% and local recurrences of human breast cancer in 75% of cases in mice**. Conversely, most of the mice not treated suffered a recurrence of their cancer, which spread.

To do this, the researchers treated mice affected by human breast cancer. They treated them as hospital patients are treated, i.e. by combining surgery with a carefully dosed cocktail of standard chemotherapies. However, the UCLouvain researchers supplemented this standard treatment with the new molecule, MitoQ. They not only demonstrated that the administration of MitoQ is compatible with standard chemotherapies, but also that this innovative treatment prevents both relapses and metastases of breast cancer in mice. *"We expected to be able to block the metastases, says Pierre Sonveaux enthusiastically. But preventing the recurrence of the cancer was totally unexpected. Getting this type of result is a huge motivation for us to carry on."* In short, this is **a giant step** given that the **three main causes of cancer mortality are recurrences, the**

spread of the cancer caused by metastasis and resistance to treatment. And that there is currently no other known molecule capable of acting like MitoQ.

How does it work? Cancers consist of two types of cancerous cells: those that proliferate and are sensitive to clinical treatments and those that are dormant and that bide their time. Such cells are more harmful. The problem? These **cancerous stem cells** are **resistant to clinical treatments**. They **result in metastases** and if, unfortunately, cancer surgery fails to remove them all, they **cause recurrences**. These relapses are currently treated using chemotherapy. However, this tends to be relatively ineffective owing to the resistance to treatment developed by the tumorous cells . This is where the important discovery of the UCLouvain scientists comes in: **the molecule MitoQ stops cancerous stem cells from awakening.**

What next? **MitoQ has already come through the first clinical phase successfully.** It has been tested on healthy patients, both men and women, and proves to be **only slightly toxic** (nausea, vomiting). In addition, its behaviour is known. **What next?** The discovery made by the UCLouvain scientists opens wide **the path for the clinical 2 phase**, intended to demonstrate the efficacy of the new treatment in cancer patients.