Can metastasis prevention save breast cancer patients?

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Femtech World meets the Swiss company on a mission to enable optimal breast cancer treatment and make lasting metastasis prevention a reality.

Breast cancer is the most common cancer in the UK and the second most common in the US after skin cancer. The [American Cancer Society](#) suggests that in 2022 about 287,850 new cases will be diagnosed in women and other 43,250 women will die from breast cancer.

Additionally, studies have shown that an increasing number of patients are not getting the right treatment during therapy.

"Despite molecularly precise cancer tests, we have a situation where more than 50 per cent of the women diagnosed with breast cancer [in the US and Europe] are either under-treated or over-treated," says Wolfgang Hackl, oncology scientist and founder of [OncoGenomX](#) – a Switzerland-based company that aims to create a treatment guidance software against breast cancer.

Their first product, PredictionStar, uses AI and machine learning algorithms to determine the correct cancer treatment regimen for permanent prevention metastasis. The tool essentially interprets the results of clinical and histological image assessments, tumour and blood gene tests and helps oncologists to find the optimal treatment with predictable outcomes.

"The solution that we have developed consists of four components," Hackl explains. "Firstly, proprietary markers help us to type individual tumors and based on diagnostic properties. Then we have two types of AI-based software: one meant to achieve individualized drug-tumour matching and the other used to make outcome predictions. Lastly, we have a feedback learning solution for the continuous refinement of PredictionStar-guided therapy decision guidance.

"But we don't leave things at predictions," the oncologist adds. "We offer the decision-makers real-world outcome data, so that they don't need to rely on predictions coming out of a black box. They can see recent clinical data from patients who have been treated, based on PredictionStar guidance, what the outcome was and then, they can make an informed decision."

Hackl says that this is a move from a very "mouse-centric approach". "We've been very good at mice and drug development, but not necessarily at curing patients," he tells me.

"Current tests are very good at determining, whether a tumour is eligible for certain treatments. These tests, however, cannot predict, whether treatments will also be effective. PredictionStar predicts the effectiveness of treatments with an accuracy of 85 per cent, thus, taking oncology a step closer to the theoretical ideal of evidence-based precision cancer treatment.

"Currently, doctors and patients can learn if the tumour will be eliminated only during the treatment journey," he continues. "The longer the tumour stays away, the higher the confidence in the treatment decision.

"The advantage of our approach is that doctors and patients would know that there's a significant high chance the treatment will be effective before the start of the therapy, taking away the uncertainty and the randomness of treatment decisions. Imagine what this would mean for the quality of life of patients."

Determining the optimal treatment option will not only reduce the risks of over or under-treatment for patients, but it will also diminish the costs on healthcare systems.

"Per year Europe and the US spend over $20B on breast cancer treatment. We are at the very beginning, but we think that consistent use of PredictionStar will incur significant cost savings," Hackl points out.

The founder adds that: "In one year and a half from now we hope we'll be ready to offer our services to pharmaceutical companies and drug developers and in two years, if everything goes by plan, we should be in a position to offer the service to cancer hospitals."

However, stigma around medical patient data still exists. Skepticism about the supposed benefits of data sharing, fear of being disadvantaged and little confidence in data security are just a few of the reasons why some patients avoid such platforms.

"This is certainly something we still see in many countries," says Hackl. "But we, as a company, never see the data. It will only be exposed to the algorithm. This is a very conventional approach which is used with great success and meets the requirements for the protection of data rights.

"Artificial intelligence and machine learning are widely recognized as a transformative healthcare innovation. However, unless introduced thoughtfully there are risks such as automation bias and over-dependence, in addition to already well-documented generic risks associated with AI, such as data privacy, algorithmic biases and corrigibility," he continues. "We are fully aware of these risks and will undertake adequate measures to ensure that clinicians retain autonomy over the diagnostic and therapy decision making processes."

The company has already analyzed data from more than 4,500 patients and four trials and has very high ambitions for the future. "We are very confident, and we hope to get one step closer to the theoretical ideal of what it means to practice precision diagnosis and medicine as the core of personalized cancer care," adds Hackl.

"But in the medical area, you always have to prove that your claims are the results of a well-designed, prospective clinical trial. And that's why we're here for."

For more information, visit oncogenomx.ch.