

## Cell Receptor

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# Saving lives by preventing metastases

Swiss-based Cell Receptor is discovering compounds aimed to tackle both cancer metastasis and autoimmune diseases.

Cell division is a prerequisite for life and for growth. In cancer, it gets out of control, becoming a threat to life. About 19 million new cancer cases occur globally each year; around half of these will be fatal. The vast majority—approximately 90%—of these cancer deaths result from metastases. Cell Receptor Inc., a small startup based in Geneva, Switzerland, focuses on the introduction of a novel type of cancer treatment through well-tolerated prevention of metastasis. Founded in 2017, Cell Receptor is collaborating with universities to extend knowledge and research in this area.

## Blocking platelet binding to stop tumor spread

Actively growing tumor cells have platelet receptors on their surface. These include circulating cancer cells, shed by the tumor, which may lead to metastasis. Activated platelets bind to these receptors and release their contents, including growth factors close to tumor cells or directly into their cytoplasm, triggering and maintaining cell growth (Fig. 1).

“To stop this, we looked at compounds that interfere with platelets,” said Hans-Åke Fabricius, Cell Receptor’s CVO. “This is a new chapter in oncology, as our approach targets an upstream mechanism outside the cell, a critical bottleneck process for cell division and metastasis. The molecules we studied inhibit cell growth by preventing platelets from docking to the surface of dividing tumor cells.”

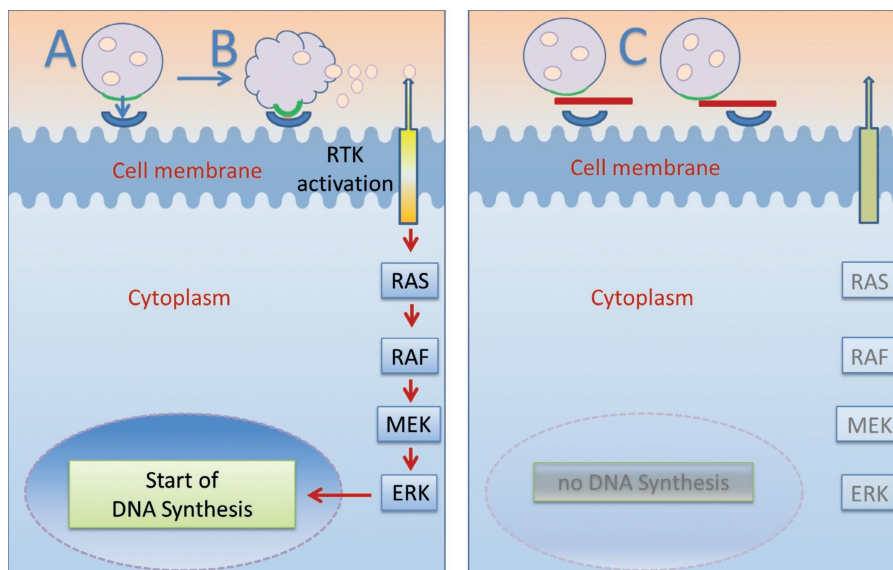
## Gaining proof of concept

Cell Receptor has found an off-patent low-cost candidate product, a mixture of small and large polysaccharides, and is developing this as a potential preventative for cancer metastasis. The European Medicines Agency and the US Food and Drug Administration have already approved the widely available compound for another medical purpose.

“Repurposing an existing product means that we will only need to seek an extension of indication. It also has potential for fast-track approval as it meets an urgent need. This approach saves both money and time,” said Fabricius.

Preclinical studies have shown that the candidate agent almost completely blocks the binding of platelets to tumor cells at equivalent concentrations to low-molecular weight heparin, with a much lower bleeding risk, allowing outpatient use. It has less of an impact on normal cell growth than most forms of chemotherapy, but regular medical checks are of course vital.

Pancreatic cancer is difficult to treat as it easily becomes resistant to treatment. It is the third most common cause of cancer death in Europe and the USA, and has only a 3% five-year survival.



**Fig. 1 | Saccharide blocks cell division.** On the left, the circulating platelet (A) binds to a growth-committed cell (B), whereupon it is immediately activated and releases growth factors. These activate the RAS-RAF-MEK-ERK signalling cascade, which starts cell division. On the right (C), after administration of a polysaccharide (red bar), the cell is unable to bind the platelet. No activation takes place; the cell therefore receives no growth impulse.

**We are ready to begin the clinical trial once we have secured the funding that we need. We are currently talking to potential investors and a manufacturer**

Hans-Åke Fabricius,  
CVO, Cell Receptor

The company is planning a four-year phase 2a proof-of-concept study in pancreatic cancer. This will be a four-arm non-blinded study of around 300 patients with surgically treated disease. A number of clinics will be involved to ensure sufficient patient accrual. The candidate is a mixture of smaller and larger molecules. As it is not well absorbed from the gut, the study will use subcutaneous administration. The company intends to develop an oral product in the future, and is looking at alternatives that have potential for oral administration.

As the mechanism targeted by Cell Receptor is relevant for most cells, it should also have potential in a range of metastatic solid tumors including

breast, gastrointestinal and lung cancer. It may also be useful in autoimmune disease for preventing immune cells from dividing.

## Finding the funding

Fabricius estimates that the intended study will cost approximately €4.7 million (\$5.6 million). The company is seeking around €10 million (around \$12 million) in funding for the clinical trial and further development of its pipeline. Fabricius estimates the global market at more than \$10 billion.

“We are ready to begin the clinical trial once we have secured the funding that we need. We are currently talking to potential investors and a manufacturer,” said Fabricius.

Cell Receptor holds patents for a family of agents for use in the treatment of cancer in Europe, the USA, Australia, Japan and Canada, and will out-license the product after a successful clinical trial.

CONTACT

Hans-Åke Fabricius, CVO  
Cell Receptor  
Geneva, Switzerland  
Tel: +49 160 486 3214  
Email: hafabricius@cellreceptor.ch