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Science notebook by Anjana Ahuja

WHAT MAKES a cancer spread? What turns a treatable tumour into a marauder, rampaging through the body to invade other organs? Neuroscientists at Imperial College London think that they have the answer — and it is causing a stir among oncologists.

One intriguing possibility is that people with epilepsy or depression may be partly shielded from aggressive forms of cancer because their medication “calms down” tumour cells. Cancer cells usually cluster together. However, they can break away and move to other sites, where they kickstart new tumour growth. This process is called metastasis. Mustafa Djamgoz, professor of cancer biology at Imperial College, realised that “in order to spread, cancer cells have to move, and in order to move, they need to release enzymes that digest their surroundings. They also need to be able to detach in the first place”.

What was special about these unruly cells? Their excitability reminded researchers of nerve and muscle cells, which need to be twitchy to function. Could the proteins that confer the twitchiness also be responsible for metastasis in cancer cells? It appears so — the Imperial scientists found a “twitchy” protein in breast cancers that was most abundant in the most virulent cancers. The findings will appear in *Clinical Cancer Research* in the next few months.

The implicated protein — voltage-gated sodium channel (VGSC) — doesn’t crop up only in breast tumours. “We discovered VGSC was expressed in prostate cancer, breast cancer and small cell lung cancer,” Djamgoz says. “This channel is like the engine driving the cancer. If we can block this channel, the cells’ metastatic behaviour is suppressed.”

And what kind of drugs might block this channel? Anti-convulsants, anti-anxiety drugs and tetrodotoxin, the puffer fish toxin that causes zombism. That has raised the possibility that people with epilepsy or depression might be less prone to cancers that spread; researchers are now investigating whether patients on medication for these conditions do indeed fare better when cancer strikes. Djamgoz’s team is also conducting a retrospective study of breast tissue biopsies. They hope to pin down the connection between “twitchy” proteins and cancer progression. Clinical trials are the next step, and Djamgoz expects success.

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