

# Genetic 'fine tuners' control body's own attack against cancer

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(Medical Xpress)—The body's own immune system's fight against breast cancer is controlled by genetic 'fine tuners', known as microRNAs, according to a study published in *Nature* today.

Looking at 1,300 [breast cancer](#) samples, Cancer Research UK scientists found that the influence of these microRNAs, which help control how genes behave, varies between different subtypes of breast cancer.

Last year Cancer Research UK scientists published a landmark study, METABRIC, showing that breast cancer can be subdivided into ten distinct genetic subtypes. These new findings relate to the most common form, which is unusual in that the body appears to mount a strong [immune response](#) to the disease. This is thought to be the reason why patients with this type of breast cancer tend to have a better outlook than

those with other forms.

The researchers were searching for relationships between the individual subtypes of breast cancer and patterns of microRNA activity in the tumours. They found that the types of cancers that trigger the [immune system](#) also have a characteristic 'signature' of microRNAs, which seem to be playing a role in controlling this response.

MicroRNAs are short fragments of [RNA](#) – a molecule related to DNA – that act as tiny switches inside cells, helping to turn genes on or off and controlling [protein production](#).

The team's findings suggest that microRNAs don't act simply as on/off switches, but have a much more nuanced role in fine-tuning a cell's behaviour, including how it interacts with the body's defence mechanisms.

Professor Carlos Caldas, senior study author based at the Cancer Research UK Cambridge Institute at the University of Cambridge, said: "Since we discovered that breast cancer can be split into ten different diseases we've been looking for the differences that make each type unique. In this particular type of the disease these genetic 'fine tuners' seem to help control the immune system's fight against breast cancer."

Dr Kat Arney, science information manager at Cancer Research UK, said: "MicroRNAs are a hot topic in cancer research right now, but there's still a lot we don't know about these tiny controllers. Understanding more about what they're doing in tumours will increase our knowledge about the biological processes that underpin cancer, and is vital for shaping the development of future treatments based on these little molecules."

**More information:** Dvinge, H. et al The shaping and functional

consequences of the microRNA landscape in breast cancer *Nature*. [doi: 10.1038/nature12108](https://doi.org/10.1038/nature12108)

Provided by Cancer Research UK

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