

Research points towards early cancer detection

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A test to detect the very early stages of cancer could one day result from new research by Cardiff University scientists.

A team at the University's School of Medicine has just published a study on telomeres – small structures at the end of human chromosomes which can play a crucial part in the onset of cancer.

Telomeres control cell division in the body - by gradually becoming shorter they can tell cells when it is time to stop dividing. However when telomeres stop working properly, they can cause the cells to mutate and start dividing uncontrollably, which can lead to the formation of tumours.

The Cardiff study used ground-breaking techniques to study telomeres in human cells. The researchers found the critical length at which telomeres stop working and also that some telomeres can be shortened or deleted at random, without any external cause.

The researchers also discovered how chromosomes can fuse together once they lose the protection of their telomeres. Chromosomal fusion causes the chromosomes to disintegrate, which can result in the development of cancerous growths. The Cardiff study means there is now a system which can detect chromosomal fusions from single DNA molecules, opening up the possibility of an “early-warning” test for cancer.

Project leader Dr Duncan Baird, of the School of Medicine's Department of Pathology, said: "This study threw up a number of significant results. The fact that telomeres can be deleted at random in otherwise normal cells indicates that some of the earliest cancerous changes can be initiated without any obvious extraneous influence. Our long-term aim with this research is to develop a clinical test to pick up these events. The fact we can now detect chromosome fusions at the single molecule level offers hope that we will be able to achieve it."

Dr Lesley Walker, director of cancer information at Cancer Research UK, which funded the research, said: "Dr Baird and his team are making great strides in increasing our understanding of the very earliest stages of cancer by looking at these changes in single cells. It remains to be seen whether they can translate their technique and findings into a reliable test for early cancers."

Source: Cardiff University

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