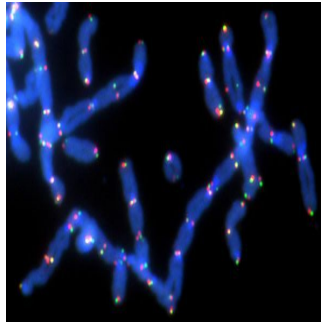

New Pathway Can Stall BRCA Tumour Growth



According to researchers at NYU Langone Medical Center, inhibiting the action of a particular enzyme can dramatically slow the growth of tumour cells tied to BRCA1 and BRCA2 genetic mutations which are tied to breast and ovarian cancers. The findings have been described in the journal *Nature*.

If these experiments prove successful, there is a possibility that a new class of targeted therapies against with BRCA1 and BRCA2 mutations could be developed.

The enzyme polymerase theta or PolQ has been found to be active in several tumours and promotes unwanted telomere fusions by inserting whole segments of DNA through a disruptive DNA repair pathway (alt-NHEJ pathway). The research team found that by blocking the action of PolQ, cancer cell growth was reduced by more than 50 percent.

During the experiments, the researchers focused on telomeric DNA. They observed that as the chromosome ends were being joined, whole new sections of new genetic material were being inserted into the telomeric DNA. This suggested that a dozen or more DNA-synthesising polymerase enzymes were involved. The researchers thus decided to focus on PolQ as it is already known to be active in several breast, ovarian, liver and colon cancer tumours.

Additional experiments were conducted that confirmed that PolQ was needed to activate the alt-NHEJ pathway of DNA repair.

According to senior investigator and NYU Langone cell biologist Agnel Sfeir, PhD, "Our studies will continue to look at how the alt-NHEJ pathway operates and what biological factors cells use in addition to PolQ to choose between the error-prone or error-free DNA repair pathways."

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Source: NYU Langone Medical Centre

Image Credit: Nature and Mateos-Gomez et al.

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