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Highly accurate and much earlier tests for cancer must save lives

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Fibre Diffraction has far more to offer than diagnostic tests for just breast and prostate cancers. Using hair and nail samples, a test for Alzheimer's Disease shows the presence of this disease before any damage has occurred to the brain, gaining time for treatment.

In addition to this, changes have been found using hair and nail samples that specifically diagnose colon cancer, adenocarcinoma lung cancer and insulin dependent diabetes. For skin samples, melanoma and bowel cancer can also be diagnosed. If more than one cancer is present, changes in the structure for both appear.

A study of breast tissue has elucidated the 4 changes in breast tissue surrounding a ductal carcinoma, which precede the cancer itself. Such changes are visible in pathology slides. A study of colon tissue has provided reasons behind the reappearance of such cancers 2 years after removal, more than 50% of such repeat cancers being terminal.

Sixty years after the first diffraction pattern was obtained our crystallographic studies have also provided a structure for hair which satisfies all known data. This structure combines sets of helices within helices, the outermost set forming 8 tetramers that give rise to the 7 lattices that define the structure.

Biography

Veronica J James completed her PhD in Physics from the University of NSW in 1971. Working in crystallography, she published 40 papers on the molecular structures of small organic crystals, before moving into the fibre diffraction studies of collagen and keratin. In this area she has carried out the diffraction study that produced the successful structure for hard β -keratin and also pioneered the fibre diffraction diagnostic tests for breast, colon, prostate cancers and for Alzheimer's Disease. She was awarded an OAM for her Phones for the Deaf Program and her Advanced Physics Programs in 1996.

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