Mechanism that stimulates tumour growth identified

Washington, Sept 25 : A team of Italian scientists has found a widespread mechanism that stimulates tumour growth in humans, and believe that this finding can lead to the development of novel diagnostic and therapeutic procedures.

Presenting the finding to the European Cancer Conference (ECCO 14), Professor Saverio Alberti from the CESI, University of Chieti Foundation, Chieti, said that his team had discovered the function of the Trop-2 gene, a product of the TACTD2 gene, which is expressed in placenta, an 'invasive' normal tissue.

"The function of Trop-2 was a mystery until now but knowing its expression in the trophoblast (cells forming the outer layer of the blastocyst - the stage between the fertilised egg and the embryo) during pregnancy, we thought that it might well be involved in another invasive function - tumour growth," he said.

Upon examining the genes in human tumours, the scientists found that Trop-2 was expressed in the vast majority of human cancers such as breast, colon, stomach, lung, prostate, ovary, endometrium, uterine cervix, and pancreas.

The researchers also found an over-expression of the Trop-2 gene when they subjected 1,755 tumours to immunohistochemical (IHC) analysis, which looks at the interaction of antibodies and antigens in tissues, and has the advantage of showing exactly where in a tissue a given protein is located.

"This has allowed us to develop anti-Trop-2 monoclonal antibodies for immunotherapy (modulation of the immune system to reject and destroy tumours) of Trop-2 expressing tumours," Professor Alberti said.

Trop-2 over-expression was found in between 65 per cent and 90 per cent of the tumour types analysed, with an average of 74 per cent across the board.

"These figures are high," Professor Alberti said.

He further said that Trop-2 was also found to be a unique marker of cancer metastases in various other tumour types.

"It is also a unique marker of cancer metastases in different tumour types - including colon, stomach, breast, and ovary in man - and across a number of species," he sad.

Professor Alberti said that the most intriguing of his team's findings was the presence of two sequence elements in the Trop-2 cytoplasmic tail, the signalling engine of Trop-2, which act as, respectively, an enhancer and a silencer of metastatic propensity.

According to him, this may be the key to the identification of signalling molecules that promote or inhibit the formation of metastases.

"If we can identify such molecules we will be approaching a situation where we could influence their activity and hence either encourage or prevent it. This could be an important step towards stopping cancer in its tracks," he said.

He also expressed interest in gathering more knowledge of the cell changes induced by receptor activation, signal transduction pathways, that are triggered by Trop-2.

"This will be crucial for the better understanding of the way in which tumour growth is regulated by the gene, and will also provide additional targets for anti-cancer drugs. We are very excited about the prospects for therapy which we can see arising from this discovery," Professor Alberti said.

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