

## Indian scientists develop mathematical model to predict cancer tumours

By Bhavya Khullar

New Delhi, April 12 (India Science Wire): Doctors will soon be able to visualize an invading tumor in 3D using a new mathematical model developed by Indian scientists.

Using results of certain tests, this model will be able to predict growth of tumors and help doctors decide on the line of treatment. The mathematical model has been developed by scientists at the Indian Institute of Science, Bangalore and National Institute of Technology, Goa.

Based on patient data such as cancer cell density, extracellular matrix density, and concentration of matrix degrading enzymes into the system, this model can calculate the invasion of cancer in realistic organ geometry like the breast.

An early detection of tumor can save a patient. Once a tumor starts spreading to other organs as cancer, curing it becomes challenging. In such situations, mathematical modeling of tumors can help predict the size, shape, and progression of tumor with time, which may prove to be a life-saving strategy.

“Mathematical model is a useful and inexpensive approach to determine and to predict the stage, size, and progression of tumors”, says Dr Shangerganesh Lingeshwaran, Assistant Professor of Mathematics at the National Institute of Technology, Goa. He, along with Ganesan Sashikumaar, has published research findings in scientific journal *Communications in Nonlinear Science and Numerical Simulation*.



Shangerganesh Lingeshwaran, National Institute of Technology, Goa (Left) and Dr. Ganesan Sashikumaar, Indian Institute of Science, Bangalore (right)

This computer model can make near accurate predictions because of two features. First, it calculates realistic organ geometries. Second, it takes into account the interactions between cancer cells and healthy tissues. These help the model to

predict how a tumor is progressing, and what will its shape and size will be with time.

“In the future, the computer model can also be used for as an aid for treating cancer and planning surgery”, scientists said, (India Science Wire)