The British Journal of Healthcare Computing and Information Management











**News**

# Mathematical model for predicting tumour growth

28 May 2009



A multidisciplinary team at the University of Granada has developed a mathematical model that will allow them to carry out experiments on tumour cell proliferation processes and find out their behaviour.

"Acting on the cell-cell communication process to try to control gene activation or deactivation may become an alternative therapy to fight tumour growth in the near future," explained Juan Soler, director of the research.

This research, led by Soler, from the Departamento de Matemática Aplicada de la UGR, and funded with €150,900 by the Andalusian Ministry for Innovation, will improve on traditional tests with animal models, which were until now the key to describe tumour growth mechanisms. The team included researchers in biology, chemistry, medicine and physics.

Moreover variables that are present in the biological process can be changed with more control than with clinical trials. This will make research in the field of tumour growth easier, and will save tests with embryos, mice or chickens, which were essential until now.

This model is specific to the tumour cell-cell communication process and reproduces with great accuracy all the mechanisms of chemical signal transmission, the cell reception of such signals and changes of the cellular functions resulting from such communication.

This has been achieved by using differential equations to describe each variable used and which are integrated by means of complex equations that, once resolved, were compared with the results of the same processes in a real model. This way, the model was adjusted and readjusted until it represented the biological process requested.

The mathematic advance necessary for the development of the model has been complemented by wide research work into the fields of biology and cellular physiology. More specifically, cellular communication chemical mechanisms derived from the Sonic Hedgehog (SHH) protein and its equivalent in flies, called HH, which play an important function in the spreading of information on the growth and development of cellular groups. The function this protein plays when it activates the GLI gene —which in turn affect tumour control — has been analysed.

In different experiments, scientists, in collaboration with Mollecular Biology centre Severo Ochoa and the University of Geneva, have proven that SHH transport control can make mice in vivo inoculated tumours disappear.



**More news**
**Features**
**Jobs**
**Market reports**
**Books**

Atos consulting wins management awards for cutting NHS waiting times
Scottish telecare programme delivers cost savings for health and social care.
Prize for open source mobile technology software that's reinventing healthcare in developing countries (videos)





**Jobs online**

**Reports Programmer**

**Programmer — SQL / C#**