

# HOW DNA CUES INDIVIDUAL CELLS TO GROW IS 'BREAKTHROUGH OF 2018,' SAYS 'SCIENCE'

Relevant for: Science & Technology | Topic: Biotechnology, Genetics & Health related developments

Researchers are studying how tissues develop cancer. | Photo Credit: [Getty Images/iStockphoto](#)

The U.S. journal *Science* has termed new technologies that reveal how DNA cues individual cells to grow through time as "Breakthrough of the Year".

Experts say these methods will transform science over the coming decades, allowing an ever clearer picture of the processes behind ageing, healing, and disease.

"Just as a music score indicates when strings, brass, percussion, and woodwinds chime in to create a symphony, a combination of technologies is revealing when genes in individual cells switch on, cueing the cells to play their specialised parts," said the report.

Modern methods build on the 2002 Nobel Prize-winning work of John Sulston and colleagues, "who mapped the development of the roundworm *Caenorhabditis elegans* by painstakingly watching larvae mature cell by cell through microscopes," said Jeremy Berg, editor-in-chief of the *Science* family of journals.

"With today's technologies, especially massively parallel DNA sequencing and advanced fluorescence microscopy, the cells that comprise *C. elegans* have been mapped again using tag-analyze-assemble methods based on gene expression patterns within each cell."

Scientific papers have been published this year on how a flatworm, a fish, a frog, and other organisms begin to make organs and appendages.

Researchers are hard at work, looking for ways to apply these techniques to human cells — how they mature, regenerate, and what goes wrong when cancer, diabetes or even physical malformations occur.

Among the projects underway is an international consortium called the Human Cell Atlas, which is identifying "every human cell type, where each type is located in the body, and how the cells work together to form tissues and organs," said the report.

Other scientists are studying kidney cell types, including ones that become cancerous, as well as the interplay between maternal and fetal cells in pregnancy.

A group of 53 institutions and 60 companies across Europe, called the LifeTime consortium, is studying cell by cell how tissues develop cancer, diabetes, and other diseases. "The single-cell revolution is just starting," said the report in *Science*.

Military communication satellite GSAT-7A, due to be launched on December 19 evening from Sriharikota, is expected to add a new space-based dimension

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