Scientists map process in tumours and find new approach to treatments

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Scientists in the United States and Germany have mapped the disease process in tumours and discovered how the tumors develop â€“ a breakthrough that could help scientists develop treatment options for cancer patients.

A team of researchers from the National Cancer Institute (NCI) in Bethesda, Maryland used sophisticated microscopy and computer software to scan 14 previously studied types of cancer cells and worked out how they responded to treatment. The research team identified genes that contributed to the growth of the tumours and which cells could be targeted to avoid any adverse reactions to the treatments.

The findings could lead to a new generation of drugs that could halt the tumourâ€™s development by targeting cell types that are not affected by existing drugs. The researchers could also develop an as yet untested radiation treatment that could hit the cancer cells and kill the tumour cells while sparing healthy cells.

â€œWe have known for a long time that our sickest cancer patients have tumours that are resistant to most treatments and that only certain drugs can stop tumours from growing at all,â€ said Dr Doug Kellogg, a cancer epidemiologist at the NCI who led the research. â€œBut weâ€™ve just cracked the code for how they do it.â€

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Pamela Greenberg, a cancer biologist at Columbia University in New York, said the findings would help scientists to create new ways to attack cancer.

â€œResearch such as this could lead to new and better cancer drugs that are more effective, safer and produce fewer side effects,â€ she said.

The researchers developed a new technique in which to look at tumours using microscopic pictures of their DNA. They could find out how various immune genes responsible for the bodyâ€™s defence against infections responded to different drugs and see which were working and which ones were failing.

â€œThis is like being able to see the global strategy of an enemy in a game of chess,â€ Dr Kellogg said.

Dr Greenford said the new techniques would allow scientists to pin down the role of each component of the tumourâ€™s development, so that they could select particular classes of cancer treatments.

The researchers, whose findings are published in the journal Nature, worked with scientists from the Gerber Institute for Rheumatology in Germany. They tested the treatment on cells grown in a laboratory dish as well as human tumours in animals.

Tests of patientsâ€™ tumours in the lab showed that anti-cancer treatments were more effective when they targeted tumour cells that were not protected by normal cells. But some therapies targeted those tumours and failed to stop their growth.

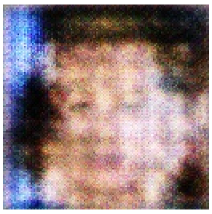
The researchers, who performed the experiments with genetically modified cancer cells, hope to use the knowledge to improve existing anti-cancer therapies to include specific segments of DNA as targets.

Previous tests of the experimental method, developed by about 500 scientists in 70 countries, had been carried out in mice with pancreatic cancer but these experiments were not as accurate.

Dr Kellogg said: â€œWe wanted to confirm our results.â€

He believes that in the near future the technique will be used in tandem with other experimental treatments and hopefully could lead to faster and more effective ways to fight cancer.

â€œThis is the potential for things to get really exciting,â€ he said.



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