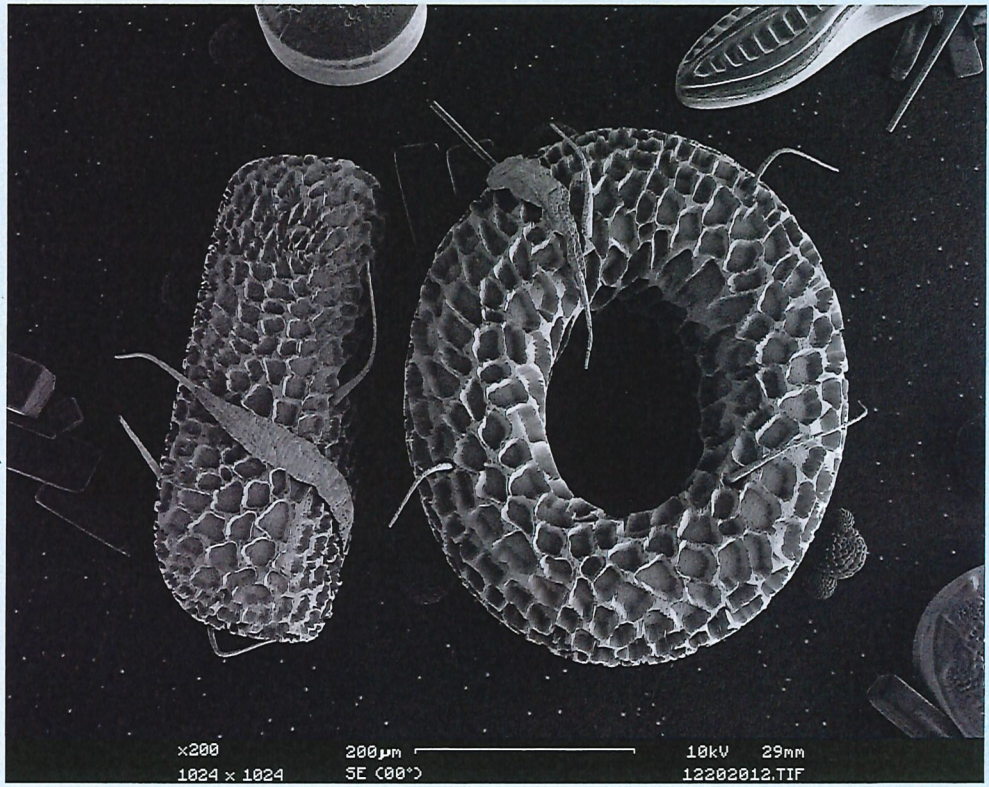
ROLF-DIETER HEUER / CYNTHIA ROSENZWEIG / ADAM STELTZNER / CÉDRIC BLANPAIN / ELIZABETH IORNS
JUN WANG / JO HANDELSMAN / TIM GOWERS / BERNARDO DE BERNARDINIS / RON FOUCHIER

CHRIS LABROOY



NATURE'S 10

Ten people who mattered this year.

366 DAYS:
the year in science

CELL TRACKER

By tracing the descendants of a single cell, a cautious developmental biologist tackled a controversy over tumour growth.

BY MONYA BAKER

Cédric Blanpain likes to see things for himself. His students, he says, "tell me in the morning that they have something very important. And I run, not to the screen, but to the microscope." When he was first setting up his lab at the Free University of Brussels six years ago, Blanpain's see-it-to-believe-it approach drew him to study untouched cells in tissues from living animals rather than, as is often done, in dishes or after transplantation. He didn't trust what cells do outside their normal environment.

His advisers warned him that the task would be tough — but Blanpain, a quick-talking developmental biologist with a penchant for snowboarding and jazz, was undeterred. He decided to refine a technique called lineage tracing, which reveals patterns of cell division in tissue. Blanpain uses low levels of a drug to activate a gene and change the colour of specific cells and all their descendants, so that they can be seen under a microscope. He often works with a theoretical physicist to analyse the starting cells' contribution to the resulting tissue. No one has been able to track cell lineages as carefully or as quantitatively, says Brigid Hogan, a cell biologist at Duke University in Durham, North Carolina.

In October last year, Blanpain's team looked at mammary glands in mice during fetal development, pregnancy and lactation. Cell-culture work had led researchers to believe that a common cell type gives rise to multiple kinds of mammary cells. But when Blanpain looked at cells left undisturbed in mammary fat pads, he saw that they contributed just to a single lineage. He then went on to show that the adult mammary gland actually contains distinct types of stem cells (A. Van Keymeulen *et al. Nature* **479,** 189–193; 2011), a fact that could help to pin down the genesis of breast cancers. Blanpain "cleared up what had been a very confusing field", says Hogan.

This year, Blanpain tackled a long-standing controversy over the existence of cancer stem cells. By applying a carcinogen to mouse skin and then using his cell-tracking method, his team was able to show that cells do not contribute equally to the resultant tumours: some of the cells in a tumour peter out after a few divisions, and others — the stem cells — produce thousands of clones (G. Driessens *et al. Nature* **488,** 527–530; 2012). This implies that drug developers should focus on killing these tumour-generating cells.

Blanpain says that he hadn't expected such dramatic results. "I saw the first slide, and I said 'show me the second one'. After the fifth, I was sure what I was seeing." ■

DELMI ALVAREZ/GETTY