



Paul Allen's latest philanthropic endeavour will be modelled on his successful brain institute.

SYSTEMS BIOLOGY

Microsoft billionaire takes on cell biology

New Allen institute will study and simulate cell behaviour.

BY EWEN CALLAWAY

Billionaire businessman and philanthropist Paul Allen plans to pump US\$100 million into investigating the most basic unit of life — the cell.

The Allen Institute for Cell Science, which was launched on 8 December, will be modelled on the Microsoft co-founder's Allen Institute for Brain Science in Seattle, Washington, which since 2003 has spent hundreds of millions of dollars creating a series of 'brain atlases' that have become go-to portals for neuroscientists interested in where particular genes are active or how distant neurons communicate.

As its first project, the new Allen institute will develop an analogous 'cell observatory' that will display how a cell's working parts, such as ribosomes, microtubules and mitochondria, interact and operate over time, says executive director Rick Horwitz. He has shuttered his cell-biology laboratory at the University of Virginia in Charlottesville to lead the institute in Seattle, Washington. The 70 or so scientific staff who will join the institute will work together on the overall goals of the observatory — to build a global view of the myriad activities inside cells — rather than on their own interests. "It's going to be much more like the Manhattan Project," Horwitz says.

Mapping every little detail of every kind of cell is a tall order, even with the backing of the

world's 27th richest person. "Our problem is that this thing could blow up on us. It could be very, very big," Horwitz says. "We're going to make judicious decisions to try to contain it."

Some of those choices have already been made, after meetings this year with leading cell biologists. The institute will study human induced pluripotent stem cells (cells coaxed into an embryonic stem-cell-like state) as they differentiate in the lab into two cell types: heart-muscle cells called cardiomyocytes; and the epithelial cells that line body cavities. These tissues were chosen as much for their relevance to

disease — cardiomyocytes malfunction in heart disease and most cancers arise in epithelial tissues — as for the ease with which they can be reproducibly generated and grown in the lab.

The institute's plan is to engineer many different cell lines and determine how different cellular components respond to stimuli such as infection or exposure to a drug. These data will then guide the construction of computer models aimed at predicting how cells operate under various conditions, and all the information gained will be made available online. The institute will also distribute its cell lines so that other scientists can build on its work.

The \$100 million is set to cover the first five years, after which Allen will review the observatory's achievements and decide whether to keep on funding it, Horwitz says. The Allen brain institute was also started with \$100 million and has received subsequent funding of \$400 million. Allan Jones, chief executive of the brain institute, says that the cell institute's success will be measured both in terms of research output — the brain atlases have yielded dozens of papers — and its broader impact on biology. "You need to make a high-quality product that people trust and believe in," he says.

Just as many neuroscience studies now begin with a trawl through the Allen institute's brain atlases, the cell observatory "will be the place cell biologists go to start projects", says Sandra Schmid, a member of the cell institute's advisory board and a cell biologist at the University of Texas Southwestern Medical Center in Dallas. Ruedi Aebersold, a systems biologist at the Swiss Federal Institute of Technology in Zurich, is enthusiastic about the plans, but says that it will take time to see whether the institute leaves an indelible mark on cell biology. "One would want to ask eventually, in five years, how this effort has accelerated that research," he says.

Trey Ideker, a systems biologist at the University of California, San Diego, says predicting how cells behave is an exciting, if ambitious, goal. "My concern is that they need focus," he says. "I think Rick's mandate is he's got to tell the world what the goal of this institute is." ■

CORRECTIONS

The y-axis on the graphic in the News story 'US-China climate deal raises hopes for Lima talks' (*Nature* **515**, 473–474; 2014) was out by a factor of 10. It should have been 0–35 gigatonnes not 0–3.5 Gt.

The picture caption in the story 'Ocean observatory project hits rough water' (*Nature* **515**, 474–475; 2014) gave the wrong date for the completion of the Ocean Observatories Initiative network: it will finish in May 2015, not March.

The story 'Green List promotes conservation hotspots' (*Nature* **515**, 322; 2014) misstated why original inhabitants of the Chagos Islands cannot return: it is owing to policies of the

British Indian Ocean Territory administration.

The article 'Rival species recast significance of 'first bird'' (*Nature* **516**, 18–19; 2014) incorrectly referred to '*Microaptor xui*' instead of '*Microaptor gui*'. It also failed to attribute the *Archaeopteryx* silhouette in the graphic to Vladimir Nikolov.

The story 'Climate tinkerers thrash out a plan' (*Nature* **516**, 20–21; 2014) incorrectly stated that discussions at the meeting would feed into a report that the US National Academies intends to release early next year. And the caption stated that the futuristic device would spray sea water into the stratosphere. Actually, the lower atmosphere is the target.