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As stem cell and gene technologies advance, La Jolla conference mushrooms

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In 2006, a few hundred mostly local researchers gathered in La Jolla to discuss the emerging but still science-fictiony field of stem cells.

Since then, stem cells, enhanced by gene therapy, have progressed to yield breakthrough treatments, most spectacularly in cancer. Likewise, the conference known as the Cell & Gene Meeting on the Mesa has mushroomed into an international event. (The mesa is Torrey Pines Mesa, the epicenter of San Diego's life science sector).

About 1,200 scientists and business executives are expected to attend the three-day conference, up from about 900 last year.

Today and Thursday, investors and potential partners are to hear from 69 listed companies. They're developing therapies for a gamut of diseases, from rare genetic conditions to big killers such as heart disease and cancer.

That's nearly double the 35 presenting companies in 2012.

"There's a lot of companies now doing a lot of interesting work, and at later stages in the development process, than there have ever been before," said Janet Lambert, CEO of the Alliance for Regenerative Medicine. The Alliance holds the conference along with the Sanford Stem Cell Clinical Center at UCSD Health.

On Friday, the scientists get their turn. Topics include genetic editing of

human embryos; the use of mini-brains "organoids" to model human brain development and diseases; and rejuvenation of old muscles.

The conference's growth has diluted its early focus on San Diego. Of the 69 presenting companies, only two are from San Diego. They are ViaCyte, a diabetes treatment developer; and Organovo, a maker of "bioprinted" tissues. And 14 are from other countries, including Australia, Chile, Japan, and the United Kingdom.

"There was pretty intense competition," Lambert said.

There's not only competition to attend, but also for space, she said. The hosting hotel, the Estancia, has been popular for its intimate setting. But the conference has maxed out the Estancia's capacity. The hotel can only house only about half of the guests.

So next year the business side of the event will move to the Park Hyatt Aviara in Carlsbad, which the conference has fully booked.

That hotel will provide double the space for attendees, Lambert said, along with 78,000 square feet of meeting space, more than double that of the Estancia.

On the scientific side, researchers have grown more adept and comfortable working with cell therapies, said Alysson Muotri, chair of the conference's scientific symposium steering committee and co-director of UC San Diego's stem cell program.

Previously, there were concerns that if any rogue stem cells were transplanted into a patient, they could become cancerous, or that they would migrate away from where they were intended to go, he said.

Scientists now know much more about how to identify and grow stem

cells, he said. Moreover, genome editing technologies such as CRISPR makes it easier to genetically alter cells with precision.

"Now we can manipulate those cells the way we want," Muotri said.

Another advance is in the use of stem cells to develop disease models not otherwise feasible, such as by producing human brain cells with mutations linked to Alzheimer's or other diseases.

And Muotri's own lab studies the brain's three-dimensional nature by growing brain organoids, small, rudimentary structures that model some of the brain's circuitry.

Last month, Muotri and colleagues published a study about an improved method of making brain organoids directly from a person's cells, such as people with autism spectrum disorder.

The science event, hosted at the nearby Salk Institute, is also wrestling with growing pains, Muotri said. So it, too, may have to move.

"We are debating that now," he said.

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