

SINKING TEETH INTO STEM CELL BANKING

BY URVASHI RAIZADA

Provia Labs' tooth stem cell bio-banking has put the future within the hands of everyday people.

Howard Greenman, CEO of Provia Labs LLC, can still remember the day he knew his start-up was going to make it.

Still in its preliminary stages and exploring whether dentists would be amenable to their tooth stem cell bio-banking idea, a proverbial leap of faith was needed. In Howard's words, "As with any entrepreneur worth his or her weight in salt, we put together everything we had and exhibited at a national paediatric dental conference."

Setting up an impressive exhibit booth with high quality marketing collateral, Howard and his Co-Founders punched far above their weight and were expecting minimum traffic of maybe 10 to 15 dentists to come to the booth and, with luck, complete a market research survey. What transpired, however, was symbolic of Provia's journey to be.

As Howard recalls, "The exhibit hall opened at 9 am and I was covering the booth alone. I will never forget making a distress call to my colleagues saying, 'Get over here now; I am swamped with hundreds of dentists.' When they arrived, I had more than 50 dentists spread across the exhibit hall floor on their knees, filling out our 4-page surveys. We were a huge hit."

Meeting with over 400 dentists in the span of two days, dentists' interest in Provia's Store-A-Tooth bio-banking concept was obvious, prompting responses from, "This bridges the gap between dentistry and oral healthcare," to "we have an obligation to introduce this to our patients."

But what do teeth have to do with future medical breakthroughs?

Stem Cells And The Tooth Fairy

A healthcare industry veteran in his own right, Howard's foray into bio-banking began at an earlier start-up, a company that focused on collecting high quality, ethically consented and donated cancer tissue from patients having tumour resection surgeries at major cancer centres. The company would handle the entire process and then distribute the donated specimens to biotechnology and pharmaceutical researchers searching for cancer cures. It was here that Howard became experienced in the systems, logistics, regulations, patient protections and other nuances associated with the collection, transport, and freezing of human specimens. During a visit to the dentist, Howard found himself talking about what he did for a living and was met with a surprising amount of enthusiasm. Consequent conversations revealed a burgeoning interest in the collection and storage of ethically acquired teeth. These teeth were being shipped to labs for dental research on the stem cells found in them – stem cells that could be used to grow new teeth as an alternative to artificial implants. Through this, all Howard could think was, "When children lose their baby teeth, are their stem cells being discarded? The tooth fairy has been ripping us all off."

Banking On The Future

In 2006, Howard and a few interested counterparts began to explore the feasibility of a service to collect children's teeth and transport them to a lab to be preserved for future, undetermined use. Their exploration focussed on four key areas: the cord blood stem cell banking industry, stem cell research, the dentist channel and, of course, the consumer.

Private cell banking is not innovative – cord blood stem cell banks have existed for nearly 20 years, as have blood banks and sperm banks to name a few. Conceptually closest to what Provia's founders had in mind, the cord blood banking industry with players such as ViaCord became case studies for their research. At the time, ViaCord had the most successful US cord blood industry exit when they were bought over by PerkinElmer for US\$300 million. ViaCord attributed its success to investing



Provia's CEO Howard Greenman believes that the era of individualized healthcare is now.

in top scientific talent, building an efficient sales team as well as nurturing durable relationships with the clinical channel which, in their case, was the field of obstetrics and gynaecology (OBGYN). Another US firm, Cord Blood Registry was recently bought over by AMAG Pharmaceuticals for US\$700 million, and had also made early significant investments in the OBGYN channel. These provided critical insight for Store-A-Tooth's understanding of its clinical channel – the dental community.

Dental sourced stem cells have been attracting global interest. Researchers from around the world who were among the first to start looking at the potential of these cells were very optimistic about the cells and their capabilities, but most were very conservative about banking these cells. This indicated that they thought it was too premature to offer families the ability to preserve these cells years before they thought clinicians would actually start using them to treat patients. "That being said," explains Howard, "we asked each researcher if they had children. For everyone that did, we asked if they would bank their children's teeth if they could. All of them said yes. In fact, a few of them had their children's teeth frozen in their laboratories precisely for this reason."

Tapping Dental Channels

Provia was not the first entrepreneurial venture for Howard or his colleagues and their experience had taught them some hard lessons. "We all previously started or joined great healthcare start-ups," says Howard, "that were generally terrible healthcare businesses. There is a very big difference between a good idea and a good business, especially in healthcare. In many of these cases, it was impossible to know they were terrible businesses until we tried to make them businesses; and in our cases, that



Provia's state-of-the-art laboratory in the US operates under the strictest regulation for cell processing and is highly scalable.

required a lot of capital.” Having seen failure and how large amounts of money can be burned through, Howard and his colleagues vowed that their next start-up would get to market on a tight budget. They would prove that customers would adopt the model and that the business was sound; only after the key market risks were truly mitigated, would they raise institutional or large financing.

In early 2012, Provia was officially launched at the Chicago Mid-Winter Dental Society conference via a 60-minute press conference with press from different dental media outlets. The company's objective for the next 12-18 months was to get the word out to the dental community that not only do stem cells exist in teeth, but they can be banked, and that Provia's Store-A-Tooth service was the highest quality technology available. Howard believes that the intense efforts of this 12-18 month period helped pave the way for Provia's current sales and marketing activities. “We attended regional and national conferences reaching out to multiple specialties, from paediatric dentists to oral surgeons, hygienists and more,” says Howard.

Practical Analysis

The last key component to Provia's ideation was the consumer, and the questions were many. “Will they be interested in this idea? Will they enrol? What fees will they be willing to pay? We ran multiple consumer surveys and interviews with the help of dentists and at consumer events. The data was very optimistic, but we did not completely believe it. Until we actually gave the consumer

a chance to write the cheque, we did not have confidence in adoption rates from this market research,” recalls Howard. To give them the tool to test whether consumers would actually buy, Provia worked with a local lab in Boston to set up a provisional platform for doing the most basic stem cell banking service. This allowed the firm to have meaningful discussions with customers and test different pricing before pitching the product. “Through these exercises, we learned a lot about how consumers perceive this service, the value proposition, the barriers to adoption, and how they compare it to cord blood banking,” says Howard.

Increasing evidence of tooth stem cell success has allowed Provia to validate its idea of reaching out to consumers willing to bank on their dental stem cells for their future health. In 2009, papers were published in Italy describing the “first in human” successful use of dental stem cells to repair defects in patients' jaws. Ever since, there have been innumerable papers chronicling the success and potential of tooth stem cells in personalized healthcare.

Validate, Grow, Dominate

“Today, we are seeing a major transformation in healthcare – an individualization of care,” says Howard. “Consumers are taking active control in their family's healthcare options; new therapies are emerging giving us hope that our own cells can be used to treat our own families; researchers are learning more about how our genetics dictate how we respond differently to the same therapies.”

During its launch stages, Provia was significantly assisted by



VP of Techonology Dr Joseph Laning, Chief Science Officer Dr Peter Verlander, and Howard face the press at the 2012 Provia launch.

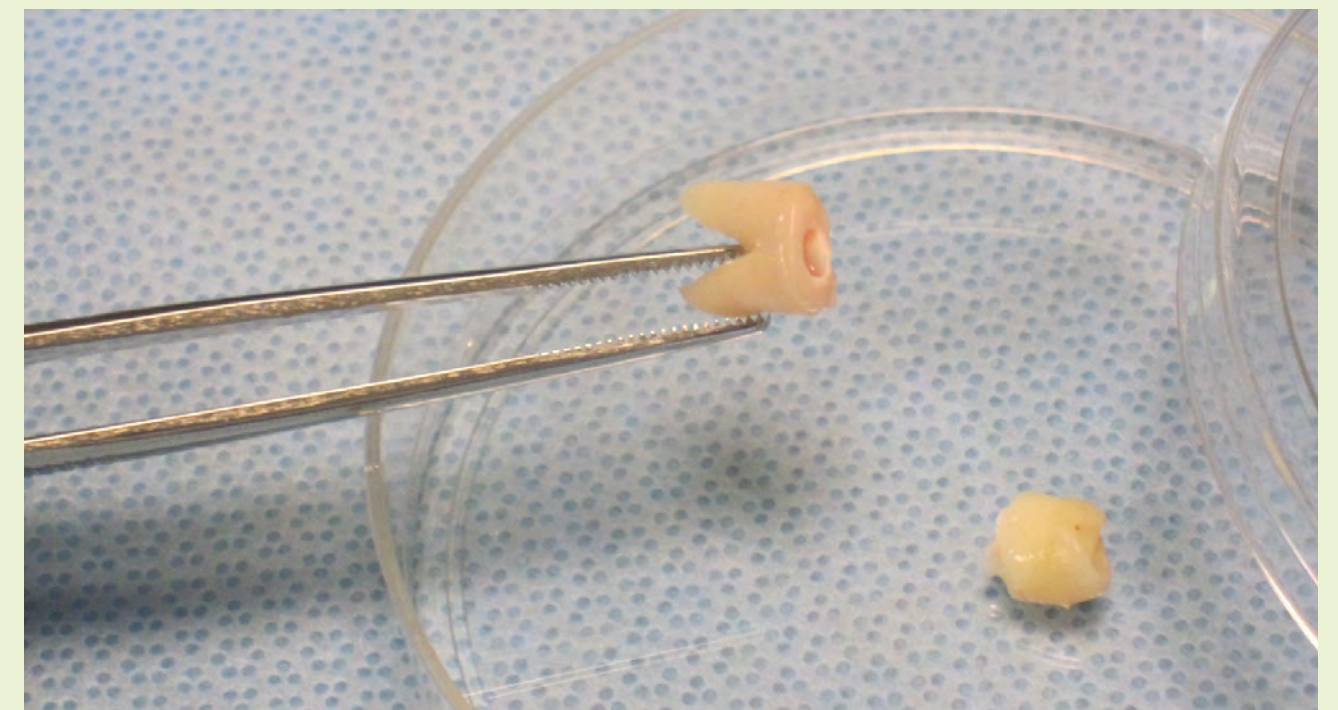
Grace Century FZ LLC and its group of investors. Seeking early stage, high growth opportunities in innovate fields, Grace Century and its investors came on board and provided the necessary funding to help Provia get to market.

Through its various stages of growth, Provia has seen to it that the integral ethics to their biotech endeavour have never been compromised. Its state-of-the-art laboratory in the US operates under the strictest regulation for cell processing and is highly scalable. With existing partners in Central and South America and Singapore, Provia now has its eyes on Europe as well as the Bahamas, which is a growing marketplace for medical tourism and stem cell therapy.

Provia is currently in its ‘grow’ phase with a highly experienced team and a steady outreach to international partners. With

a staunchly built internal and external sales team and rapid expansion on its horizon, Provia seems well on its way to becoming a dominator in the tooth bio-banking field.

And what lies in store for the bio-banking field as a whole? Says Howard, “Every stem cell is different and they do different, complementary, and amazing things. Tooth stem cells can grow solid tissue and are extremely powerful tools to grow neural cells. As the world matures and regenerative medicine develops, we learn more about different kinds of stem cells, how they can be used for different therapies, and how sometimes they can be used interchangeably or sometimes not. We tell people to bank everything – cord blood, adipose tissue, teeth, bone marrow – because in combination, they create a very powerful toolkit for your family and children.” 🦷



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