

“The coming back to life of the tendon was faster than I’d imagined. It gave me everything back.”
JASMINE TREBSE, VIOLINIST

FEATURES

Joint venture promises speedy fix

EXCLUSIVE

Technology may put an end to wonky knees

SARAH-JANE TASKER
HEALTHCARE

The masterminds behind one of Australia’s introductions to cell therapies are reinventing the wheel with game-changing products that will revolutionise treatment for hundreds of thousands of patients with tendon, cartilage and soft tissue damage.

Paul Anderson and Ming Hao Zheng are the driving force behind Orthocell, an Australian-listed regenerative company that is commercialising a non-invasive stem cell therapy. The company is also closing in on regulatory approval for a collagen scaffold device aimed at speeding up tissue repair.

The stem cell therapy for the regeneration of tendon tissue, developed by Zheng, a professor in the faculty of medicine, dentistry and health sciences at the University of Western Australia, is, according to Anderson, “a world leading, first-in-class” approach to damaged and degenerative tendon tissue that cannot heal itself.

The cell therapy is simple and is done in a doctor’s room — the patient can walk in and walk out.

The procedure involves injecting a patient’s own cells, which have been harvested from a healthy tendon, back into the problem area.

It has already been trialled across Australia to treat the Achilles tendon, patellar tendon, gluteal tendons, tennis elbow and rotator cuff and it is also being trialled for cartilage regeneration.

“They are massive markets. There are 300,000 rotator cuffs done in the US each year and there are many hundreds of thousands of patients with tennis elbow,” says Anderson, managing director of Orthocell.

Anderson uses the example of a group of tennis elbow patients who had suffered symptoms for more than 30 months and had failed all previous treatments before being introduced to Orthocell’s product.

“We have followed a group ... for 4.5 years after their initial injection and they have shown an improvement of 207 per cent in their ability to grip,” he says.

The company recently gained ethical approval from The Avenue hospital in Melbourne to compare its tendon regeneration method against traditional surgery for severe tennis elbow. Orthocell hopes the study will show its non-invasive product is superior, or equal, to standard tennis elbow surgery. The US, Europe and Japan markets for tennis elbow treatment was estimated to be worth \$US70 million in 2015.

The stem cell therapy injection,



COLIN MURTY

Jasmine Trebse had returned to pre-injury mobility six months after undergoing Orthocell’s ATI treatment

How stem cells gave violinist her life back

SARAH-JANE TASKER

It took a split second to pause Jasmine Trebse’s life. A major tear to a tendon near her elbow tore away her passion and profession of playing the violin and she faced a future of chronic pain until a revolutionary stem cell technology from the University of Western Australia gave Trebse her life back.

Trebse had caught her arm on a door handle and on the surface the injury was just a bruise near her elbow, but the violin teacher says she was

instantly hit with excruciating pain and the loss of mobility.

“I couldn’t write, drive, play my violin, or even walk without pain as when I walked it engaged the tendon — the pain was constantly there,” she says.

The injury, in July 2011, to her extensor tendon on the right arm (near the elbow) was originally treated as a non-serious tear that would improve with rest and physiotherapy. An MRI one month after the incident showed a 97 per cent tear to the tendon.

Trebse, who was 52 when she was injured, lost her ability to demonstrate the violin to her students and she also had to give up composing.

“I started to think should I change my life direction,” she says.

for which Orthocell is chasing regulatory approval in the US and Europe, has already helped a range of elite sportspeople, including Olympic skiers, wrestlers and swimmers and AFL, soccer and rugby players.

Anderson says the big market though is the weekend warrior and domestic and work-related injuries. He says Western societies are facing an “age quake”, which will drive a “muscular skeletal tsunami”.

Anderson says the government and thought leaders are saying that if doctors want to continue to control the agenda, and do operations they recommend as opposed to operations recommended by the government or insurers, more sophisticated approaches to deal with injuries of an ageing population need to be developed.

“If people are retiring later and wanting to be mobile and contribute for a longer period of time, then we need to be sophisticated

When it was clear rest and physiotherapy would not heal the tendon, a referral to an orthopedic specialist delivered the first glimmer of hope that Trebse could get mobility back.

It was in March 2012, eight months after the injury, that she first heard of Perth-based Orthocell’s tendon regeneration treatment, ATI.

“The specialist mentioned they had done an ATI procedure with Achilles tendon repairs and perhaps we should try it on my arm,” she says.

Cells were taken from her right patellar tendon and then in Orthocell’s laboratory two vials of five million cells each were created. It took about five weeks for those cells to grow, ready for implementation by injection.

On May 8, 2012, Trebse had the cells injected into her arm while she was awake during a day procedure. It was a one-off injection and no follow-up physiotherapy was needed.

Four weeks later, she felt life coming back into her arm. Eight weeks later, she made two minutes of sound on a violin. Three months later, she could do everything she could always do with some discomfort and at the six-month mark it was like the injury never happened.

“Life was highly restrictive as soon as I did the injury and the procedure gave me my life back,” she says, adding she plays the violin every day.

“The coming back to life of the tendon was faster than I’d imagined. It gave me everything back.”

tissue in the jaw and the rotator cuff tendon, in the shoulder.

“This is a game-changer internationally. We are competing with a product in the US that uses dead human skin. I think we can do better than that,” Anderson says.

“This is a globally resonating technology, which is attracting a lot of interest from global companies and government organisations such as in the UK.

“I get calls from surgeons every

THE AUSTRALIAN
CREATIVE
COUNTRY

the business of innovation

in partnership with nab

July 28, 2016 | creativecountry.com.au

day about when will the scaffold be available.”

Anderson says there is a 40 per cent failure rate with surgical methods to repair tendons and that Orthocell’s collagen product would reduce the re-operation rate.

Zheng, chief scientific officer of Orthocell, says while the stem cell therapy he created was a “world first”, there were many collagen products on the market. But he says the difference with his collagen product is he has eliminated non-collagen molecules from the raw material, which have the potential to cause inflammation.

The raw material is porcine but the company doesn’t reveal the origin. Anderson says the company has an advantage internationally because Australia has the best disease-free herds.

“We are developing a high-end medical device from a material that would otherwise be thrown in the bin,” he says.

Anderson says the company is a “10-year overnight success”, and it has been working through a long validation process.

Zheng and Anderson first teamed up in 1999 to lead German stem cell company Verigen’s entry in the Australian market. That company was later sold to US giant Genzyme.

After the professional relationship established in that venture, Zheng took his stem cell therapy idea to Anderson in 2004.

“To come to me and say I think I have this concept, and to see that cell therapy concept having now treated more than 350 patients ... to provide a strong scientific translation of this technology into the clinic is a truly remarkable achievement,” Anderson says of Zheng.

The professor says while academics chase publication of their research, he wanted more.

“In my mind I want to have an impact on society. Many academics are still learning how to make a publication to have an impact,” he says.

Anderson says the company is attracting global interest but says it is hard for the local market to understand that a product from Australia has global relevance.

“The difference between us and others is we’ve done this once before (with Verigen). We commercialised it, sold it and we’ve moved on to our own company after that,” he says.

“We have a lot of learnings we are now applying to this experience.”

WEEKEND AUSTRALIAN

realestate.com.au

Mansion

STEP INSIDE AUSTRALIA'S MOST PRESTIGIOUS