

Topical gel appears to speed up healing

by Penni Crabtree

Not many biotechnology companies can get a sneak peek, long before getting the OK to mount human clinical trials, at how an experimental drug might perform in real life.

But for San Diego's CoDa Therapeutics, the chance came in December 2005 when a New Zealand construction worker had his eye doused with concrete spewed from a malfunctioning high-pressure hose.

The epithelium - the thin layer of cells that cover the surface of the cornea - was burned away because of the concrete's alkaline content. Conventional medical treatment was unsuccessful, and the man was told that he would lose all vision in the eye.

At the request of the man's physician, CoDa Therapeutics, a New Zealand biotech affiliated with the San Diego start-up, received "compassionate use" approval from New Zealand's government drug regulators to treat the eye with the experimental medicine, Nexagon.

HEALING GEL - Dr. Kaa-Sandra Chee (foreground) and Dr. Colin Green experiment with Nexagon, an experimental topical gel, on donated human corneas. CNS Photo courtesy of Colin Green. After one application of the topical gel, the man's epithelium began healing within the first 24 hours. It continued to improve rapidly. And, today, he has 20/20 vision.

The experience proved poignant for all involved. And it had its practical use when CoDa's two-person management team began seeking funding from venture capitalists to get the drug into human studies.

In October, CoDa received its first \$10 million financing from Domain Associates, and in February got a commitment for an additional \$10 million that is expected to close by month's end.

"It's a helpful anecdote, a true throw-away-your-crutches story," said Brad Duft, chief executive officer of CoDa Therapeutics. "We've had positive results in 14 different preclinical animal models, but when you have positive results in a human being, it gives you an indication that you are not barking up the wrong tree."

CoDa began life in the laboratories of Auckland Medical School professor Dr. Colin Green and his former post-doctoral research student, Dr. David Becker of the University College of London.

Green and Becker were doing research in gap junction proteins, the cell-to-cell communication system that allows cells in the body to "talk" to one another. The researchers discovered that when tissue is damaged, those proteins increase, and the escalating "chatter" spreads from dying cells to neighboring healthy cells, causing them to die and increase the damage.

From that discovery Nexagon was developed. The gel is designed to inhibit the formation of gap junction proteins, muzzling the injured cells and slowing the spread of damage, inflammation and swelling.

"Some 4,000 genes get modified, turned on or turned off, after an injury," Green said. "We're seeking to turn the tap off right at the beginning."

The two researchers applied for patents on their discovery in 1999, and in 2003 formed New Zealand-based CoDa Therapeutics. But while the research moved along briskly, the business side stalled until Green met Duft, a San Diego biotechnology industry veteran who was consulting for a New Zealand government-led initiative to connect New Zealand companies and inventors with business development experts.

Duft agreed to come aboard, and set up CoDa Therapeutics in San Diego to handle the financial and business development end of the Nexagon enterprise. CoDa Therapeutics licensed Nexagon from its New

Zealand counterpart, which has royalty rights and shareholding in the San Diego company.

The New Zealand firm is under contract to continue research and manage initial clinical trials in New Zealand.

Duft said the arrangement is far more simple than it sounds, describing the New Zealand operation as "two guys and a dog." The San Diego headquarters is slightly smaller. "Two guys and no dog," Duft joked.

In other words, CoDa is one of that growing breed of "virtual" biotech start-ups that farm out research and other tasks to contract service companies or university laboratories while maintaining a small management team.

The cost-saving virtual model is one that appeals to CoDa's first big investor, Domain Associates, which was reluctant at first to consider investing in the firm.

"There has been so little success in wound-healing deals, and when Brad Duft said he had a wound-healing deal our reaction was ho-hum, no reason to believe this one would work out," said James Blair, a partner with the venture firm, which has offices in Princeton, N.J., and San Diego. "But Brad is a very credible guy for us, so we sat down and listened to the story."

Ultimately, Domain liked what it heard.

"Wound-healing is a graveyard of ideas that have been tried, but this seems a true novelty, a very different approach," Blair said. "The compound is one we think has demonstrated safety and efficacy. Of course, we won't know until we do the clinical trials."

CoDa will launch Phase 1 and Phase 2 studies this year to test Nexagon as a potential treatment to reduce scar tissue and speed healing after eye surgery, as well as general, post-surgical wound healing. The data on the drug's potential benefits and safety should be available early next year.

"For a very small investment, relatively speaking, we should get some very big answers very soon," Duft said.

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