Purdue targeted drug combination could expedite bone fracture healing, be used as injection

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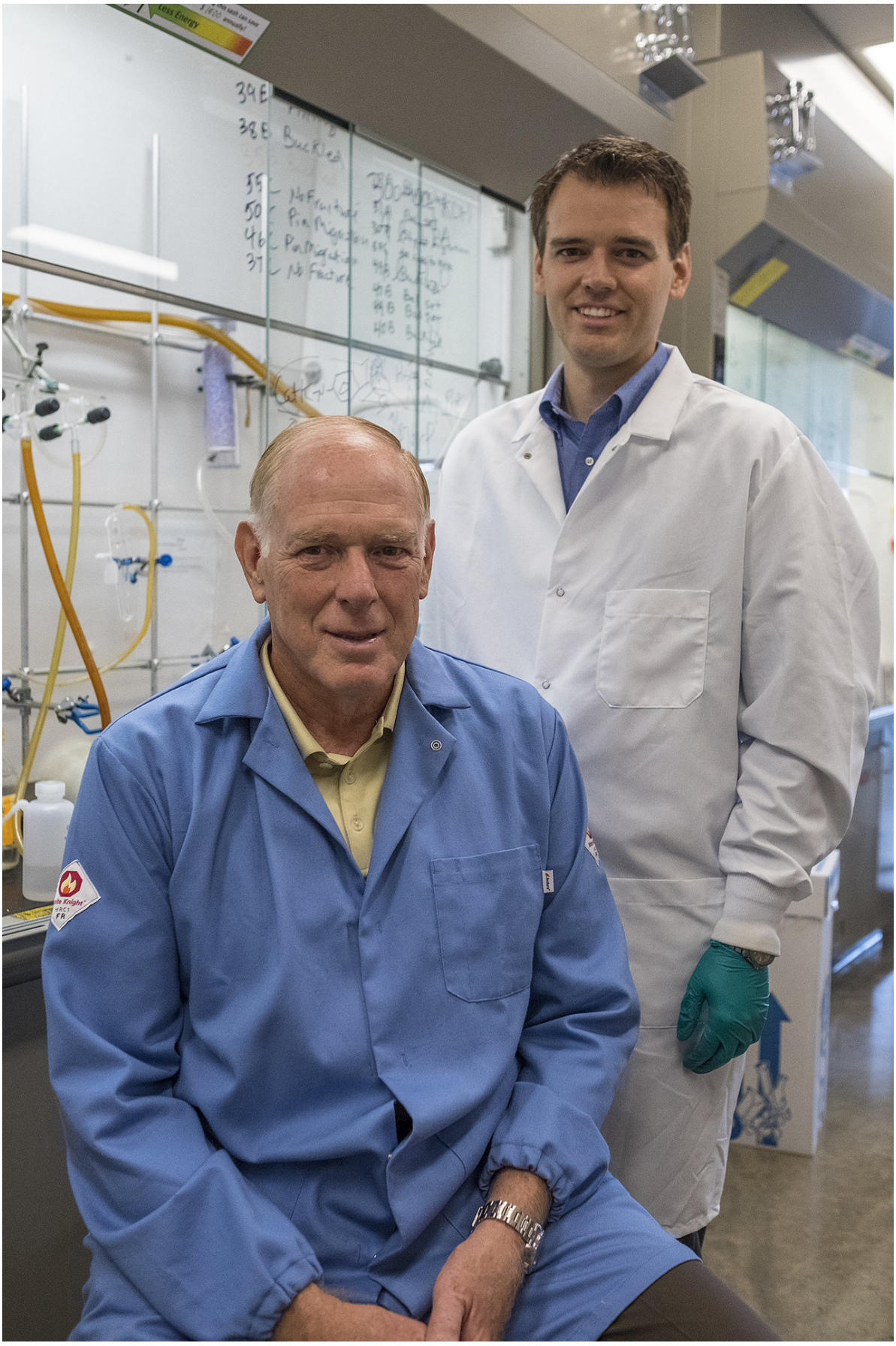
Less Energy

Purdue University father and son esteemed researchers Philip Low and Stewart Low are developing and commercializing a targeted drug combination that, when injected, is shown to expedite bone fracture healing. Credit: Purdue Research Foundation

Purdue researchers are developing and commercializing a targeted drug combination that once injected into a patient could speed up and improve bone fracture healing, and significantly cut recovery costs.

Novosteo Inc., a startup developing the technology, was co-founded by father and son team Philip Low, the Purdue Presidential Scholar for Drug Discovery and the Ralph C. Corley Distinguished Professor of Chemistry and Stewart Low, a postdoctoral staff member in Purdue's Department of Chemistry.

Stewart Low said bone fractures can pose several risks to patients.

"People over 65 years of age who experience bone fractures, specifically hip fractures, have a one in four chance of dying from fracture-related complications. Half of these patients will not regain full mobility within a year," he said. "We plan to focus initially on hip fractures in the elderly. We believe this is an area of underdevelopment and concern, so our goal is to help provide a better solution for these patients."

Novosteo is developing fracture-targeted bone anabolic agents that selectively accumulate on the bone fracture surface where they accelerate the healing process.

"When we inject this drug systemically, it will circulate throughout the

entire body but only accumulate at the fracture site," Low said. "Because of this, we're potentially able to bypass any side effects and give patients drugs that would otherwise be too potent to administer. Essentially, doctors will be able to give higher drug doses and have reduced patient side effects."

Low said the drug's targeted ability is what makes it superior to conventional options.

"The only clinically approved bone healing drug must be applied locally during surgery, where the pharmaceutical is painted directly onto the broken bone," he said. "This is an invasive process, and one we're trying to avoid. Our technology is similar to an insulin shot, an injection of the drug needed as the first line of defense."

The technology could also have a large economic impact, Low added.

"Healing a bone fracture can cost over $80,000 from start to finish, including nursing home costs," he said. "By helping patients to heal faster, we can reduce the nursing home and recovery costs significantly and users will be able to afford the small extra cost of our drug."

Low said the drugs could be beneficial in several other applications.

"Our drug could be applied to any fracture and should be particularly beneficial to athletes or anyone who may be missing extended periods of work because of a bone fracture," he said. "We might also be able to aid people who are not eligible for surgery, such as hip-replacement candidates and patients with other limitations. We've developed a drug that speeds up the osseointegration process, the formation of a direct interface between an implant and bone, so it could also help these procedures and significantly decrease recovery time."

The company is a member of the Purdue Startup Class of 2017. Technology used by Novosteo is licensed through the Purdue Research Foundation Office of Technology Commercialization. Novosteo is currently in the preclinical stage of drug testing and is seeking funding to continue development.

"Through preclinical studies we have demonstrated that our drug heals bone fractures better than an untargeted drug," Low said. "We've shown that we can dramatically speed up and improve the fracture healing process. With further funding we hope to make more strides in proving the efficacy of the drug and accelerating its translation into the clinic."

Provided by Purdue University