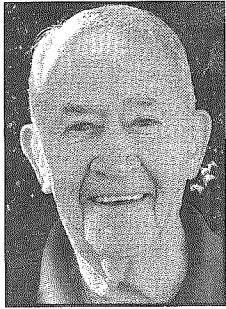


James D. Babbitt 1924-2013



Services for legendary Flagstaff businessman and World War II veteran James D. Babbitt are scheduled for 10 a.m., Thursday, Sept. 19 at

the Elks Lodge in Flagstaff. Mr. Babbitt bought the Babbitt Motor Company in 1965, which became Jim Babbitt Ford. He served three years as a fighter pilot in Europe. Mr. Babbitt died in Sun City Thursday, Aug. 29. He was 89 years old.

Growing Skin and Jobs from Bok Choy

By Bonnie Stevens
Flagstaff Business News

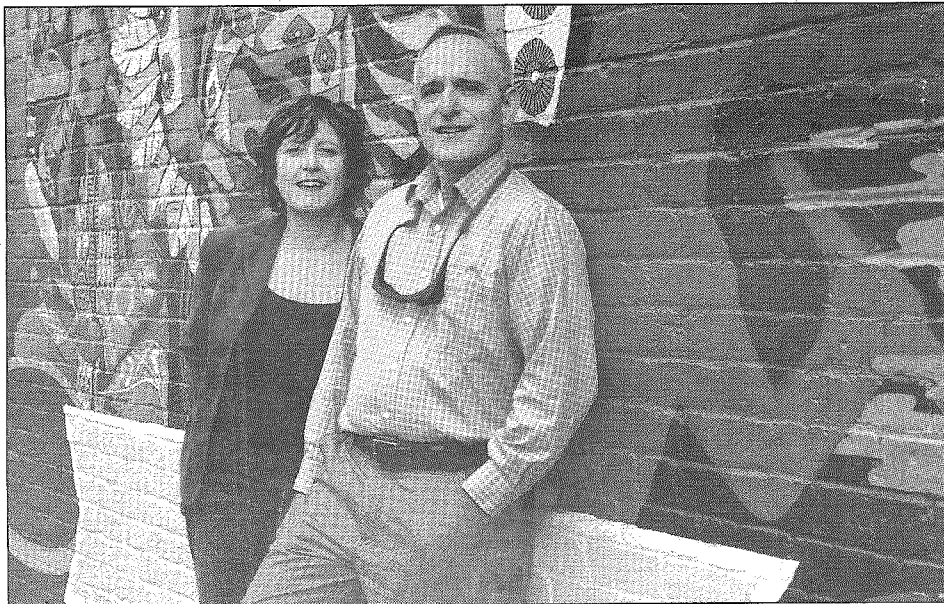
Step into Dr. Robert Kellar's lab and you have entered the future. On McMillan Mesa, this 39-year-old scientist, professor and president of Development Engineering Sciences (DES) has figured out how to put plants to work to grow human protein. When his patented products have cleared the clinical trial stage and entered the manufacturing stage, he plans to put some 30 to 40 people to work in this field of regenerative medicine.

Basically, Kellar is growing human skin and his business plan calls for the creation of high-tech jobs in Flagstaff.

Drawing on his physiology, biology and mechanical engineering background, Kellar has built instruments and equipment that can be made for about \$3,500 and could fit in a garage.

In his labs at NACET (Northern Arizona Center for Entrepreneurship and Technology), researchers and Northern Arizona University biology students in lab coats are injecting human cells into vials, spinning out human

Continued on page 38➔



Flagstaff Cultural Partners' Laura Kelly and the City of Flagstaff's Mark DiLucido are striving to transform underutilized spaces into centers of activity and creativity.

Photo by Ronnie Tierney, Fresh Focuses Photography

Go Ahead, Mak

By Constance DeVereaux
Flagstaff Business News

In the fourth century BCE, the Greek philosopher Plato, denizen of Athens, wrote about the value of Beauty (it was capital B back then) to civic life. The idea was that people's day-to-day welfare benefitted from the presence of beautiful things: architecture, gardens, music, poetry and communal events: theater performances and even sports competitions – the Greeks invented the Olympics, after all.

Beauty was at the core of a good life for individuals, but by and large also benefitted the city. Happy citizens are engaged citizens who participate in making their communities

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Gluten-Free is
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→ **SKIN** continued from page 1

protein with 25,000 volts of electricity and storing the material in an incubator set at human body temperature. The process leverages recombinant DNA technology that is owned by a collaborative company of DES, Protein Genomics. Proteins are created from DNA sequences (codes) in a lab by using host organisms to express (create or manufacture) human full-length proteins.

He explains it like this: The human gene that makes the protein elastin, which has elastic qualities, can be extracted from the DNA code and grown in a lab by yeast, bacteria or plants. Stem cells, derived from a patient's own fat, can then be added to the organically grown protein to grow skin. Kellar's genomics products are being designed to repair serious wounds, whether they are caused by vehicle accidents, burns, disease, or the battlefield.

"Take bok choy, for example. We can take the human gene, infect this Chinese cabbage and hijack the plant to start making the protein. We then put it in a blender of sorts and pull the protein out. From here we can make scaffolds - gauze-like sheets - that can be cut into different shapes to fit the wound," he said.

The magic of Kellar's creation is the use of human stem cells. As he explained, "These are cells that haven't been told what they'll be when they grow up. So we tell them to be skin cells. Isolated stem cells are then used to seed the natural scaffold." Stem cells can be retrieved from places like blood circulating through the body or bone marrow. But Kellar says one of the least invasive ways to grab some stem cells that have tremendous regen-



From his laboratory at NACET, Robert Kellar, Ph.D. is tinkering with human proteins that are created using recombinant DNA technology.
Photo by Bonnie Tierney, Fresh-Focusus Photography

erative potential is through liposuction. "Even the most lean, petite person has subcutaneous fat. And we don't need much," he said.

In the process of making the scaffold, the liquid has been removed, or lyophilized, from the material, creating a dry powder. Like freeze-dried food, it can be shipped easily or even carried in backpacks for military battlefield applications and reconstituted when needed.

While today's regenerative medical products are made of synthetic polymers, Kellar's product is human. And it is the individual's own stem cells, which the body recognizes and accepts, that heal the wound in a matter of days, with minimal scarring.

"In the field of regenerative medicine, we

human protein, NACET is incubating Protein Genomics. "We look for businesses that are interested in scaling up significantly and their technology is such that when it hits its stride it can create opportunities for exponential growth," said NACET Vice President Annette Zinky. "What makes NACET such a good match for science is our team of mentors have expertise in commercializing science, taking scientific discovery and figuring out where the market is and translating it into a sellable product. Science means money and jobs."

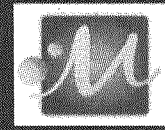
Kellar sees the manufacturing stage for the company on the five-year horizon. "This is very exciting. We've proven that it works in bench top and preclinical studies. We will be presenting a regulatory submission and will be awaiting clearance from the FDA [Federal Drug Administration] to test it on people."

For the medical world, Kellar's work is likely to become the next state-of-the-art technology in the arena of enhancing and saving lives. From a business standpoint, the success of the company could mean turning bok choy into a whole lot of cabbage. NACET businesses invest and hire locally, and it is estimated they have brought in some \$29 million to the regional economy since the public private partnership began in 2008. **FBN**

To learn more about DES, Protein Genomics and the science of economic opportunities in Flagstaff, visit Dr. Kellar and other scientists during the NACET and STEM City Center Open House and Demonstrations from 11 a.m. - 5 p.m., Friday, Sept. 27 at 2225 N. Gemini Drive during the Flagstaff Festival of Science.

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