What do Curing Cancer and Growing Sugarcane have in common?

Sugarcane. Where do you picture this tall plant growing? In hot, humid places such as India, Brazil, and Hawaii, right? So there's no way it would grow in dry, dusty Southern Utah.

But if you analyze the data, you'll see sugarcane needs just four things to grow: nitrogen, water, sun, and mulch. It grows in Washington County just fine. In fact there's a sugarcane club here. It was started by Gary Stone. Gary happens to be one of the people responsible for a new cancer service cropping up in Southern Utah as well. It is called Intermountain Precision Genomics and is located near Dixie Regional Medical Center (both are services of Intermountain Healthcare) in the Rim Rock Plaza.

Gary knows ***growing sugarcane - like curing cancer - requires innovative thinking.*** Just as Gary changed people's perceptions of cultivating sugarcane, Precision Genomics is changing the way people see cancer treatment.

Let's talk about the "C" word (cancer), for just a bit.

Cancer is a scary word. Many people, however, don't understand exactly what it is. You probably know your body produces new cells all the time. It also sloughs off old cells. When new cells grow and divide -- without stopping -- that's cancer. Cancer can happen in almost any part of your body.

Cancer is usually treated by radiation or chemotherapy. Radiation is high-energy rays. These rays damage cancer cells and stop them from growing. (They don't affect healthy cells.) But radiation only affects the cells it hits. In other words, it's only good for localized cancer (cancer that is in only one specific area of the body). But it doesn't work for all types of cancer. That's why chemotherapy is used.

Chemotherapy is a fancy word for chemical drugs that affect *all* the cells in your body. It's used for cancer that is in more than one area. Unfortunately, chemotherapy medications can't tell the different between healthy cells and cancerous cells. They impact every cell that's growing.

Distinguishing cancer cells from healthy cells is what Precision Genomics is all about.

Genomics is a fancy word that simply means studying your DNA. If you've ever seen an ad about tracing your ancestors through your DNA, you've seen an ad for a simple genomics test. A more advanced genomics test is now being used to treat cancer.

What happens is your surgeon takes a sample of your cancer. He sends it to a lab that can perform gene sequencing. The lab analyzes the sample and performs genetic mapping. This mapping shows the cancer's genetic makeup. Then a customized and targeted treatment plan can be developed.

As you can imagine, however, it's quite complicated. According to David Loughmiller, lab manager for Intermountain Precision Genomics, "Genomic sequencing is like cutting up the Mumbai phone book and putting sections A-G back together again in the right order. It's a lot of little pieces to find and put together correctly."

This detailed "cutting" and "sorting" can't be done in just any lab. It requires specialized, cutting-edge equipment and training. You see, as researchers "sequence" or put your DNA back together, they find flaws. These flaws help physicians develop a treatment plan. A plan -- customized just for you -- where the drugs only kill cancer cells, not healthy ones. That's how personal cancer treatment, through genomics, works.

Personalized cancer treatment is now in St. George

Although the examination of genomic flaws in tumors has been around since 2005, it's been only in academic settings, with patients who had advanced cancers. These were special situations where the usual therapies didn't work. These therapies have now been approved for more mainstream use. That's what Precision Genomics is doing. They have developed a one-of-a-kind place. A facility that supports patients and doctors through the entire process from diagnosis to treatment.

This means if you know someone with cancer, they no longer have to travel to Salt Lake, or Houston, or another big city with a "cancer" center. These patients can be treated right here. (And the treatment is the most advanced medicine available.) It also means that ongoing studies, testing, and targeted therapies are being developed here. It's so cutting-edge that Stanford Research has partnered in developing this center, including having a cancer team locally, as well as in California.

Intermountain Healthcare and Stanford University Transform Cancer Treatment

Intermountain Precision Genomics has a big goal. This goal includes excellent patient treatment and care, physician involvement, and community engagement. Part of giving excellent care is ongoing cancer research. This is where the partnership with Stanford University comes in. Dr. Lincoln Nadauld is leading the team from Stanford. Dr. Nadauld has been a medical oncologist with Stanford University, as well as a consulting assistant professor.

Dr. Nadauld, along with Dr. Derrick Haslam and Gary Stone, are a team with a long-term vision of improving cancer treatment. They envisioned this center in St. George a long time ago. They've now made it a reality.

"I don't think the world recognizes we've entered into an entirely new age of enlightenment," says Gary. "Scientific enlightenment that we haven't seen before. The human genome data has transformed medical sciences."

Gary likens our day to the turn of the 20th century when scientists were finally able to see bacteria and viruses. They understood they were causing diseases. They learned how to stop them through vaccines or antibiotics. It was a shift in understanding.

This same shift is happening with curing cancer, and it requires a new type of thinking. Gary knows, innovative thinking – whether growing sugarcane or curing cancer – helps accomplish the seemingly impossible.

If you want to know more, visit https://intermountainhealthcare.org/services/cancer-care/precision-genomics/