Can Curiosity Cure Cancer?
BY ALAN DUKE ON APR 16, 2015

Curing cancer without harming the patient has long been a goal of medical researchers, but the curious mind and the “out-of-box” approach of Dr. Craig Dionne offers new hope. “Everybody is affected by cancer sooner or later,” Dionne says. “What we do to patients is frankly brutal. We’ve got to get away from that.”

If Dionne’s newest drug proves effective and safe for killing cancerous tumors, perhaps his fame will rival the Jenner name. If your first thought is Bruce Jenner, then you’re reading too
many tabloid stories. If Edward Jenner popped into your mind, then you’ve had your head in the textbooks.

Edward Jenner’s no reality TV star. He was the English country doctor whose “out of the box” 18th century thinking resulted in a smallpox vaccine that saved many millions of lives. As did Jenner two centuries ago, Dr. Dionne is a passionate and creative explorer who combines keen observational skills combined with the courage to try an approach no one has ever attempted.

“It takes discipline to make yourself think creatively, and go against the grain,” Dionne says. He cites Thomas Edison’s observation that invention is 99% perspiration and 1% inspiration.

Like many of today’s technology innovators — including Elon Musk, Jeff Bezos, and Larry Page — Dionne was also young when he started questioning how the world works and thinking of ways to make it better. They all are disrupters who dared to be misunderstood and followed a path others considered crazy or impossible.

Dionne’s disruptions include dramatically changing the way his research and development teams are assembled. You could call him a scientific producer — like an Academy Award winning producer creating great films through the assembly of custom teams from around the world that are the best at a specific craft or talent. Dionne applied similar lessons learned from his previous employment when he founded GenSpera in 2003. Instead of building an “empire” of employees below him, he hired collaborators. “By design we build the best custom teams from around the world to solve a problem,” he explains. “So my burn rate on the money spend is low relative to big pharmaceutical research and development. I don’t need to build an empire.”

Dionne calls his latest invention a “grenade drug” because its toxic chemical is released from its wrapping only when it makes contact with a specific molecule in the blood vessels feeding tumors. Mipsagargin, a plant based drug, can kill those vessels, halting the cancerous growth while not attacking normal tissue.

Results from the phase II trials with advanced liver cancer patients show great promise for an alternative to invasive surgery and the grueling chemo infusions used to attack cancer for
decades. Potentially this approach to killing cancer tumors can be applied to other cancer types as well. GenSpera is planning phase three testing for 2016, which could put mipsagargin on track for FDA approval for widespread use in 2018.

Dionne’s journey as a science innovator began in a small Louisiana high school where a “fantastic teacher” taught him “how you can have a fertilized egg grow into a full human being.” The lesson convinced him science was his future. “I knew I wanted to be a bio-chemist.” E.D. White Catholic High School in Thibodaux, Louisiana, was so small it only offered a 10th grade biology class. Dionne, who was class president and later its valedictorian, convinced the principal to add advanced biology, but it was up to Dionne to recruit 10 other students to make it worth the schools effort.

He earned several scholarships that led to a Bachelor of Science degree in biochemistry from Louisiana State University and his Ph.D in biochemistry from the University of Texas. Dionne met his wife in graduate school, where she was also a student. “We knew we would be geeky scientists, with books filling a tiny home,” he says. “We never expected to make any money. We were scientists who loved being in the lab. We’re the first ones in the world to know something that’s not in the textbooks until five or 10 years after we do it. We invent stuff.”

He hit a professional roadblock during his post-graduate work because “no one would work with me,” he says. He couldn’t find collaborators for publications in his “very competitive” field, which left him “very depressed” about his desire to be a science scholar. So he found an industry job.

His first job with the Rorer Group — best known as the maker of Maalox — put him in “a great culture” of like-minded researchers allowing for “creativity, imagination, discipline, and heartbreak… everything you have in a good endeavor,” he says. “We collaborated with everybody in the world. We just said to upper management ‘We’re working on cool stuff and we’ll tell you what we are doing at the appropriate time.’

He suddenly went from no productivity to full productivity. He learned molecular biology while inventing two techniques to solve problems that had never been explored before. Success came because he was not afraid to take on projects that were considered impossible, risky,
and/or where others had failed, he says. “This was the best training in the world. Start by doing what others deem to be impossible.”

His Rorer Biotechnology boss, Dr. Joseph Schlessinger, asked him to take on a project that was considered impossible. Although Dionne doubted he could succeed, he “gave it a shot.” He developed techniques to find and magnify a single molecule in a test tube. Schlessinger, now chair of pharmacology at Yale, was impressed. “I was able do this because I paid attention to details assumed irrelevant and noted that one of the DNA restriction sites was different from the others and nobody had paid enough attention to this,” Dionne explains.

It was a breakthrough made possible by seeing what others don’t take the time to see. Like Jenner — whose breakthrough came when he observed cattle farmers, who were often exposed to cowpox, were less vulnerable to smallpox.

“I have three or four out-of-the-box ideas a year,” he says. “It doesn’t just drop out of the sky. It’s because I’m constantly looking for these inspirations all the time. I’m curious.”

When faced with an impossible question, ask yourself “exactly the opposite,” he says. It can open your mind to an answer. “Don’t take the obvious path.”

“Invent, Design and Innovate”
Dionne learned a lesson about big corporate culture when he was asked to lead a project that had been done 10 years earlier and he already knew the project was pointless. He was told to hire 10 people to work on it anyway. “It was not about science with this guy,” he says of a former boss. “It was about building an empire. That just showed me how big companies work.”

A love of science led Dionne to leave Rorer and take a pay cut to join Cephalon “because they had a molecule that I really wanted to work with.” Cephalon was only studying how this molecule promoted neuronal survival and not how it also could inhibit growth. But Dionne suspected the negative aspect could be used against cancer.

Just as he convinced his high school principal to approve an advanced biology class if he recruited the students, Dionne got his vice president’s approval to use the molecule for
cancer research, but without company resources. “They said you can do it off the clock,” he says. “I ended up doing this out of my house, on the telephone.”

He found collaborators around the world to work with him and this molecule, including Dr. John T. Issacs of Johns Hopkins University School of Medicine. “This was research pulled out of the trash can,” he says. “I had a huge phone bill making this work.”

No one else was working the same way, but his success proved his methods. “We developed our methods for cancer therapy on other people’s dime. For three years running it was the most profitable drug development process for the company.”

“My work was understanding signal transaction from the cell to the nucleus, causing them to die or survive,” he says. When he showed his work to corporate executives, “every single one said I was either crazy, it was a bad idea, or it would never work,” he says.

Dionne realized he had to leave Cephalon to truly innovate. “I like making new drugs,” he says. “I don’t like following others by making ‘me, too drug clones’”

“I was paid buckets of money at Cephalon and I went cold turkey to nothing,” he says about leaving the safety of a generous corporate paycheck.

Dionne, risking it all, started GenSpera with no business experience and without knowing how to raise money. “I just said I’ll learn how to do it,” he says. It was just like he learned about every phase of medical research and development as he encountered them.

The “truly novel” G-202 drug developed at John Hopkins University in the 1990’s, followed him to GenSpera in 2004, under an exclusive license to the university’s patents. His colleagues also became founding members in GenSpera.

“We learned a lot about the other cancer drugs now being used, which are finely tuned to a certain molecules behavior, but cancers always found a way to get around these molecules,” he says. “Cancer can’t escape OUR drug. There is no way to get around it.”
Raising money to research his molecule was tough until he had data to support his belief. His Big Pharma friends said “you’re too early stage,” he says. So he had to be inventive in raising funding from high net worth individuals, including some scientists and doctors.

The first two phases showed “we really have a well behaved drug,” Dionne says. “Now we have wonderful data and I’m a happy guy,” referring to the phase two trial results just published for G-202, now called mipsagargin. “It’s a long journey to say ‘I told you so,’ but it really is a vindication.”

Dr. Dionne travels to China and Japan in the coming weeks to expand GenSpera’s partnerships with leading pharmaceutical and research organizations to implement phase III trials in Asia — which has the world’s highest rate of liver cancer.

“I may soon hand our drug over to big Pharma since they are best at distribution and marketing,” he says. “I have no desire to build the infrastructure required”. Dionne wants his drug out there saving lives, but also so he can move on to his next great invention.

A story about Dionne is not complete without looking at the man..

Dionne’s shares his life’s lessons with University of Texas at San Antonio students. “The most exciting thing that will rejuvenate you is when you work with young people who are eager for true innovation and entrepreneurialism.”

While building his reputation as a science architect in his industry, he’s a father at home. He and his scientist wife adopted three special needs children from South America starting with a son born in 1988, followed by a daughter in 1991 and another son in 1993.

How did they manage that? “My wife’s a saint,” he answers.