Bucking the Odds

Sir Harry Kroto

Chemistry and Biochemistry Professor

Tallahassee

"People often ask me how to win a Nobel Prize," says Sir Harry Kroto, a 1996 Nobel Laureate in chemistry, "and I say, 'Don't ask me, because I didn't go into science to win any prizes.' I needed a job, and I was good at it. It was a lot of very hard work, and I'm not sure I enjoy hard work anymore than anyone else does."

As a chemistry and biochemistry professor at Florida State University, Harry's research led to the discovery of the C60 molecule, commonly known as buckyball, which has opened the door for improvements in a variety of fields from cancer research to weaponry manufacturing. When Harry and his chemistry colleagues Robert Curl and Richard Smalley fiddled with the C60 molecule in September 1985, they observed that its spherical cage, formed by 60 carbon atoms, resembled a geodesic dome, an architectural style that the futurist Buckminster Fuller had introduced with great fanfare at the American Pavilion of the 1967 Montreal Expo.

"Buckminister Fuller's dome had a big influence on me," says Harry, who, as a burgeoning graphic artist, traveled to Canada almost 20 years prior to see the Expo. "As I was conducting experiments with Robert and Richard, it seemed to me that there might be some clue in Fuller's work, and I suggested we read through his book. I also made a star dome at home, and I remembered that it had pentagons—not just hexagons on it—and so those were clues to what this molecule was. It seemed only right to name it after Buckminster Fuller—the Buckminsterfullerene—and the molecule species 'fullerenes.' There was a poetic rhythm to it.

And then we realized that this carbon structure resembled a soccer ball. Everything fell into place."

So many things have fallen in place for Harry Kroto since the discovery of buckyballs. Eleven years after Harry and friends engineered their first Buckminsterfullerenes, the Nobel Prize committee honored the three scientists as co-winners of the 1996 chemistry prize. The Nobel Prize opened doors for Harry, and offers to lecture, speak, and conduct buckyball workshops came pouring in from across the globe. That same year, he was knighted for his contributions to chemistry.

There was a time, however, when Harry wasn't sure he was cut out to do chemistry for a living. "I gave myself five years," Harry recalls telling himself after taking a permanent position at the University of Sussex in 1975. "If, after that time, it didn't work out, then I would focus on graphic design, my first love, or go into scientific educational TV."

Five years came and went. Harry stayed with chemistry. He enjoyed teaching, and he was beginning to see results from his experiments. In year seven, "I hit a very thick seam of beautiful work—it was too beautiful to be wrong," he says. "That first breakthrough was so satisfying."

Even after the discovery of C60 in 1985, Harry still felt that graphics and design was what he was destined to do. "The discovery of C60 caused me to shelve my dream of setting up a studio specializing in scientific graphic design. That was the downside of our discovery. But if you want to be successful in anything, you have to make sacrifices, especially anything creative." Although, he adds, "I think if I'd known how hard it was going to be, I would have probably decided to do something else."

Personally, Harry has found a balance between his research and his eclectic interests in science, culture, and the arts. He still dabbles in graphic design and also produces science films and video interviews with Nobel Laureates through his Vega Science Trust.

Technically, Harry moved to Tallahassee to "retire," but he has yet to find time to take it easy. "Coming to Florida State has been a fantastic move," he says. "I have wonderful friends here. There's a great, new crop of young people in the chemistry department."

Mentoring the new generation is a serious endeavor for Harry. "I think that the main job of a teacher is to tap the creative potential of every student—to put kids in an environment where they can be creative," he says. "That's not easy because you may have 30 kids, and they're all different. And it doesn't matter what you teach. It's just a case of encouraging kids to find something that they are prepared to work at 24 hours a day."

Harry says that no matter how mundane a subject might seem on the surface, it's worth exploring because something unexpected often turns up just when it is the least expected. "With this recipe, whatever your limitations, you will almost certainly do better than anyone else," he says. "I like helping kids find something to work on where they won't be satisfied with a second-rate effort."

Additionally, Harry's chemistry research continues at Florida State; he appreciates the chance to work with scientists at the National High Magnetic Field Laboratory, the largest magnet lab in the world and the only one of its kind in the United States. "I'm very fortunate because Florida State wanted me to carry on with my research," explains Harry. "I never expected to be in Florida, but here we are; we've been very happy here."

At times, Harry still finds his professional accomplishments incredulous. "I mean, I didn't think I was going to be a professor," Harry admits. "I didn't think I was going to be a prize

winner—the last thing I thought was that I was going to be a *Nobel Prize* winner. I used to think you had to be smart to be a scientist. Now I know you don't have to be that smart. You have to be good at your job, be curious about the way the world is, and work hard. And if you're extremely lucky, you might end up with an award."

Quotes

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