

J. Craig Venter, Ph.D.



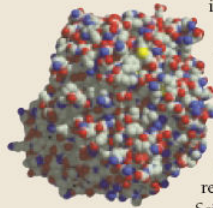
Courtesy TTAG

**President and Chairman,
Institute for Biological
Energy Alternatives**

Once you've decoded the human genome, what do you do for an encore? If you're Craig Venter, you set about saving the environment.

Venter is best-known for his work on the genetic blueprint known as the genome. As president of Celera Genomics, Venter raced government researchers to map the genes in human beings. The two groups finished simultaneously, proclaiming victory in 2000.

Venter has since spun off in several directions. He is still chairman of the Institute for Genomic Research (TIGR), which he founded in 1992. Now he heads three more organizations. The TIGR Center for the Advancement of Genomics hopes to advance science by educating policymakers, students, and others. The Institute for Biological Energy Alternatives (IBEA) conducts environmental research. And the J. Craig Venter Science Foundation provides support to the three groups.



Carbon Dioxide

Venter's work at IBEA is perhaps most urgent. "After I finished sequencing the human genome," he said, "I considered the

most important societal issues and decided that environmental problems were the most pressing ones for our survival."

The institute is taking a multi-pronged approach. One goal is to use genomics to assess entire ecosystems and monitor changes invisible to the naked eye. An avid sailor, Venter launched this new field of environmental genomics with a look at the Sargasso Sea. Relying on the once-controversial "shotgun" technique he used for the human genome, the effort used high-powered computers to reassemble random bits of sequenced DNA.

The result? The discovery of at least 1,800 new microbes and a million-plus genes—astounding biodiversity in an area once thought relatively lifeless. "If you use DNA sequencing to look closely at seawater, you can make more discoveries than all marine biologists have made in the last decade," said Venter. "In a cup of seawater!"

Another goal is to find ways to keep carbon dioxide (CO₂) out of the atmosphere and prevent global warming. Our society relies so heavily on burning oil and coal, Venter explained, that we've exceeded the capacity of micro-organisms and plants to use the resulting CO₂. "We're seeing if we can use genomic tools to speed up organisms' metabolism to capture the CO₂ at a rate that would help undo the damage we're doing," he said.

Developing an eco-friendly fuel source, such as hydrogen, is yet another goal. Although hydrogen-production techniques already exist, they're expensive. And in the US, hydrogen is extracted from oil—a process that itself produces CO₂. Venter hopes instead to harness biological power to produce hydrogen or other clean fuels. "Many organisms produce hydrogen and methane but not the large amounts required to run automobiles or airplanes," he explained. IBEA has already created an artificial virus, a success that brings them closer to creating a customized, hydrogen-producing microbe.

Venter's early teachers probably never suspected their student would become a world-class scientist. Back then, Venter was more committed to surfing and girlfriends than studying. It wasn't until he returned from a stint as a medical corpsman in Vietnam that he got serious. Intent on medical school, he got hooked instead on basic science and went on to earn a doctorate in physiology and pharmacology from the University of California at San Diego.

Said Venter, "My career should give hope to lots of parents!"

—Rebecca A. Clay