

“The Genome Warrior”...

...became his nickname in the late 1990s during the race to sequence the human genome, or “Genome Mephisto”, as he was dubbed by one of our writers at that time. These, however, were the rather friendly expressions. Others called him “bad boy of science” and off the record echoes of “idiot” or “maniac” or even worse expletives resounded through international labs.

James Craig Venter, the “perpetrator” and one of the most controversial figures of modern science, is making headlines again. Together with his team he has just published a trilogy of papers in *PLoS Biology* summarising the first analyses of roughly 7.7 million sequenced snippets of sea-borne genomic DNA, which they collected during their three-year Global Ocean Sampling (GOS) expedition.

Venter went through the whole GOS endeavour surrounded by great fanfare, as usual! From the start, for example, he denoted it a 21st-century version of Charles Darwin’s 19th-century voyage on the HMS Beagle.

Venter’s “Beagle” was his own sailboat *Sorcerer II*, specially equipped to circumnavigate the globe and collect as much microbial DNA as possible from the ocean water. Its latest voyage started in Nova Scotia, passed through the Panama Canal, then tagged the Galapagos, Polynesia, the Horn of Africa, the Caribbean and the U.S. East Coast. Every 200 miles, the team pumped 200 litres of seawater through a layered filter system that separated viruses and various kinds of cells by size. The obtained DNA was later decoded on shore by using an immensely powerful supercomputer specially designed for the project.

The recently presented analysis covers about one-quarter of the samples from Nova Scotia to the Galapagos and only the viruses and smallest cells. Nevertheless, the machines and software had to analyse 6.3 billion bases of DNA sequence and finally tallied genetic coding for more than 6 million new proteins, doubling the number already tabulated in the world’s genetic databases in one go. At the same time, this unprecedented and overwhelming tide of data indicates that microbial diversity on the one hand, as well as global genetic diversity on the other hand, might be far, far richer than hitherto estimated. And that we’re only in the earliest stages of its discovery...

Accordingly, most comments are enthusiastic, “remarkable technical achievement”, “great milestone event”, “exciting new starting point”, “rewriting microbial taxonomy”, “new view of basic microbial biology”, “providing new insights in evolution”...

Others, however, cannot resist criticising the GOS expedition as just another outburst of Venter’s egomania. As if it would change anything about his achievements. Okay, Venter is definitely an egomaniac. True! Just to give you one example; it transpired that the supposedly anonymous human genome sequenced by Venter’s former company, Celera, largely comprised his own DNA. (US bioethicist Arthur Caplan reported the *San Francisco Chronicle* on this, “Venter tells me that other people also provided DNA for the Celera sequence. ‘But how much of it was

yours?’ I ask. ‘Two-thirds.’ ‘Which two-thirds?’ ‘All the good parts,’ he says, with a devilish grin.”)

However, Venter’s egomania has always been his main driving force for creating outrageous and seemingly impossible scientific visions as well as opening ways to really tackle them. (At the moment Venter’s two “projects” are trying to create life, and catalogue all the genes on the planet.) Basically, this is exactly what a scientist should do, regardless of any personal motivation, and Venter does it exceedingly well.

One particular comment in *Science* by James Prosser, a molecular biologist at the University of Aberdeen, sounded, however, strangely misplaced. It read, “A more serious drawback of Venter’s study, says Prosser, is that the samplings do not appear to have been carried out with any specific scientific hypotheses or aims in mind. The cynical view is that these are little more than “fishing trips”, he says. ‘There would be greater potential for scientific advances if more focused, better designed studies were carried out.’”

Come on! Give the guy a break! Of course, Venter had “an aim in mind”: To sequence as much marine microbial DNA as possible. A hypothesis can easily be inferred. How about: There are probably many more microbes out there than we think, the majority of which cannot be kept alive in culture dishes, so let’s see how many really exist by tracking their DNA. But is that really important? Would the obtained sequences have turned out to be different with a specific hypothesis in mind?

Science isn’t and has never been only hypothesis-based, as some of the high priesthoods of science would desperately have us believe. Science rather always starts with observation and description, and only later proceeds by building and testing hypotheses based on the described. That’s exactly what Darwin did. He collected, observed, described, collected, observed, described... and only after observing and describing a colossal amount, was he able to build up his theory of evolution.

What Venter has done differed only in one point. He first had to *make* a whole lot of global genetic diversity *observable*. Now everybody can watch and observe the new data (they are freely available on the Web) and generate one’s own hypotheses. Take Venter’s own team, which has already started to tune in to the more detailed description of the marine metagenome by identifying more than 2,000 genes for presumed photoreceptor proteins or for members of 20 new families of kinases. So, maybe you are eccentric, “Genome Warrior”, but first and foremost: Thanks for the brilliant service to science!

The Editors



J. Craig Venter:
bad or brilliant?

