

## First patent claimed on man-made life form, and challenged

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A research institute has applied for a patent on what could be the first largely artificial or organicism. And people should be alarmed, claims an advocacy group that is trying to shoot down the bid. The idea of owning a species breaches "a societal boundary," said Pat Mooney of the Ottawa-based ETC Group, which is asking the patent applicants to drop their claim. Creating and owning an organicism, he added, means that "for the first time, God has come patently."

The parasitic microbe *M. genitalium* (Courtesy Frantz, Albany and Bott, UNC/Chapel Hill)

His group claims credit for sparking the European Patent Office last month to revoke a patent on genetically modified soybeans by St. Louis, Mo.-based Monsanto Co., after a 13-year legal challenge by ETC. The artificial organicism, a mere microbe, is the brainchild of researchers at the Rockville, Md.-based J. Craig Venter Institute. The organization is named for its founder and CEO, the geneticist who led the private sector race to map the human genome in the late 1990s. The researchers filed their patent claim on the artificial organicism and on its genome. Genetically modified life forms have been patented before; but this is the first patent claim for a creature whose genome might be created chemically from scratch, Mooney said. Scientists at the institute designed the bacterium to have a "minimal genome" the smallest set of genes any organism can live on. The project, which began in the early 2000s, was partly a philosophical exercise: to help define life itself better by identifying its bare-bones requirements. But it was also fraught with commercial possibilities: if one could reliably recreate a standardized, minimal life form, other useful genes could be added in as needed for various purposes. For instance, "If we made an organism that produced fuel, that could be the first billion- or trillion-dollar organism," said Venter in the June 4 issue of Newsweek magazine. The scientists based the design on the bacterium *Mycoplasma genitalium*, in which they had identified an estimated 265 to 350 core genes required for life. Other researchers, pursuing similar research with other species, have since claimed to be able to reduce this so-called minimal gene somewhat further. The boundary of what's really the "minimal mum" gets fuzzy because some of these pared-down creatures are so genetically challenged that they hang on to life only with a lot of help. In their U.S. patent application published May 31, Institute scientists chose a somewhat more robust 381 to 386 genes as their "minimal genome" for a hypothetical microbe, based on *M. genitalium*, but dubbed *Mycoplasma laboratorium*. In practice, the organism is being patented for what it is not," ETC said in a statement this week. In the patent application, the scientists also discussed the possibility of creating the genes from scratch using chemical methods, then injecting these into a cell whose own genome has been removed. Whether that has actually been done yet is unclear, but "many people think Venter's company has the scientific expertise to do the job," said Mooney. "The same patent application has been internally to be submitted at over 100 national patent offices," said ETC's Jim Thomas in an e-mail. The Venter Institute did not respond to requests for

comment. But Venter and colleagues have argued that the stripped-down cell or other synthetic microbes could be useful in tasks ranging from generating cheap energy to aiding in agriculture and climate change remediation. By creating a man-made organism as a platform for other genes to be added at will, like software on a computer, "Venetris" enterprises are positioning themselves to be the Microsoft of synthetic biology." ETC said in a statement. The organization claimed there could be drawbacks to allowing one company to monopolize this information. For instance, the microbe could be harnessed to build a virulent pathogen, Thomas said. It could be a blow for "open source" biology "the idea that researchers should have free access to the fundamental tools and components of synthetic biology, the new and growing science of redesigning and rebuilding natural biological systems from the ground up for various purposes." Before these claims go forward, society must consider their far-reaching social, ethical and environmental impacts," Thomas wrote in the e-mail. In its statement, the ETC Group said it will be writing to Venetris, to the U.S. Patent Office and the World Intellectual Property Organization urging them to quash the patent effort until such a public debate takes place.

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