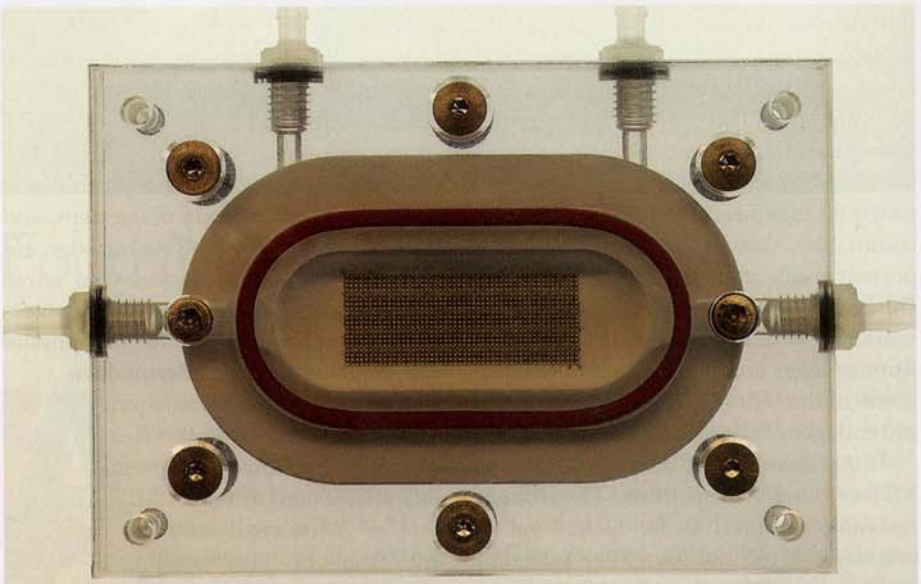
MIT Declares a Major
The class of 2008 is about to change the world of biology

THIS FALL, MIT undergraduates will get to do something that none of their predecessors has done before: declare a major in biological engineering. It may not sound like a big deal, but nearly 30 years have passed since the Institute introduced an entirely new major—linguistics and philosophy—into its curriculum. And biological engineering is so cutting edge that adequate textbooks don't even exist. "We're doing something that is truly historical," says Douglas Lauffenburger, the director of the Biological Engineering Division. Students of the new discipline will tinker under the molecular hood of life, trying to understand the functioning of DNA, proteins, and other cellular components and designing and building entirely new materials, drugs, electronics, or even organisms.

More than a dozen years ago, an ad hoc committee came together to discuss the need for a curriculum that married biology with engineering. Out of those discussions, an undergraduate minor in biomedical engineering arose in 1995, and it is now one of the most popular minors at MIT. But for all the useful applications of biomedical engineering—robotic surgery, brain-machine interfaces, noninvasive imaging, and new ways to analyze heart signals to diagnose disease—it was not making use of the latest advances in molecular and cellular biology. So in 1999, the Institute launched a PhD program in biological engineering. On the heels of that program's success, a formal committee convened to talk about how to translate the graduate curriculum into an undergraduate course.



Linda Griffith's liver simulator exemplifies the promise of biological engineering.

That major was approved in February. Students will take basic science classes, like organic chemistry, genetics, and cell biology, alongside nine more-specialized classes, like statistical thermodynamics of biomolecular systems and biomolecular kinetics and cell dynamics. When they graduate, they will have far different skills than biomedical engineers do. Whereas biomedical engineers may figure out how to replace injured organs with artificial ones, says Lauffenburger, biological engineers will figure out how to reprogram the cells in a damaged organ in order to return it to its healthy state. But the potential applications of biological engineering extend far beyond medicine. Once scientists understand how life's machinery works, they could, say, arrange biological molecules to develop new materials or reprogram DNA to produce new organisms.

Since the program is so new, some professors will have to come up with their own teaching materials, based on research literature or their own experiences in the lab. But they shouldn't feel too overwhelmed. For the first five years, MIT will limit enrollment in the program—admitting only 20 students in the first year. "We want to start small and really get it right and not be overwhelmed," says Linda Griffith, chair of the Biological Engineering Division's undergraduate-program committee. Feedback from the students will help Lauffenburger and Griffith adjust the coursework over time. But industry and other academic institutions will certainly have their eyes on that history-making first class.

TRACY STAEDTER

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MIT Metric

MIT's student-to-faculty ratio (as defined by the Common Data Set, a collaborative effort of the College Board, Peterson's, and *U.S. News and World Report*)