

APPLICATION STORY

uPrint Puts a New Spin on Biological Research at UCSF

"The uPrint enables the fabrication of custom centrifuge rotors for as little as \$80, whereas a comparable commercial product would likely cost thousands of dollars."

— Joe Derisi,
UCSF Professor

Magnetic cell purifier.

As unhealthy as it may sound, Joe Derisi has a passion for viruses. DeRisi is a professor and vice-chair of the Department of Biochemistry and Biophysics at the University of California San Francisco (UCSF). At his lab, he and his team focus on the cause of malaria and investigate other viruses such as SARS, Avian Flu and others.

Winner of a MacArthur "genius" grant, DeRisi is known for his enthusiastic pursuit of new techniques and is responsible for designing and constructing the "ViroChip", a groundbreaking tool for detecting the presence of all known viruses in only one step.

As you might imagine, DeRisi's line of work requires a high degree of scientific rigor, which translates into substantial lab hours and equipment costs. In order to control these costs, DeRisi started to think about how he might manufacture key pieces of equipment in-house. It was then he started looking into the possibilities of 3D printing.

"I researched 3D printing for several years and was looking for a printer that could quickly and inexpensively produce highly customized parts for the lab," said DeRisi. "In a lab like ours, we frequently have the need for customized parts that are unavailable elsewhere or impractical to machine. We have the need for quick access to replacement parts as well."

The uPrint Cure

After looking at many 3D printers, DeRisi decided to purchase Dimension's uPrint Personal 3D Printer from California-based Paton Group. Paton is a Dimension authorized reseller specializing in delivering industry grade products for CAD, CAM, CNC, RP and Lasers to technology education, vocational and training programs in California, Nevada and Hawaii.

"UCSF was primarily looking for a way to cut the cost and time required to replace and develop custom lab parts," said Chris Miller of Paton Group. "We recommended uPrint because it has the ability to deliver quality, lab-ready models that can withstand the daily rigors of research, at an affordable price."

Designed for the desktop, uPrint requires only a 25 x 26 in. footprint and features an 8 x 6 x 6 in. build envelope. Using Dimension's proven FDM technology, uPrint prints models in ABS, an industry-proven thermoplastic, making it ideal for testing the form, fit and function of models and prototypes. uPrint also features a soluble support removal system, allowing for hands-free removal of the model support material.

Just months after purchasing the uPrint, DeRisi and the UCSF graduate students and post-doctorate fellows have manufactured a wide array of parts including bench top centrifuges, racks, pipette holders, gel combs, slide boxes, slide washing racks, microscope adaptors, DNA models, protein models, fluidic adaptors, cell-purification devices and more.

“The uPrint enables the fabrication of custom centrifuge rotors for as little as \$80, whereas a comparable commercial product would likely cost thousands of dollars,” said DeRisi. In addition, he reports that the uPrint produces magnetic cell purifiers at 1/30th the cost of a commercial solution and pipette holders at a fraction of the commercial price.

“Along with the savings on custom parts, uPrint is a powerful way to assist us with visualization of molecular models, and our team continues to find novel, unexpected uses for the printer,” said DeRisi.

Interested in how you can successfully incorporate 3D printing and cure the lab expense blues? Stay tuned – DeRisi is working on a paper describing the use of 3D printing in research environments, including STL models of some of the equipment manufactured in his lab. For more information on DeRisi’s work visit his Website at <http://derisilab.ucsf.edu>.



Custom pipette racks.



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