



Student Research Translates to Success

Industrial engineering student James Mann always planned to start his own company. He spent several years working on nanostructured materials production in a joint research program with Industrial Engineering professors Srinivasan Chandrasekar and W. Dale Compton and Materials Engineering Professor Kevin Trumble. Working closely with this team gave Mann the opportunity to take the research a step further in 2006 and form a company called M4 Sciences. Short for "Micro/Meso Mechanical Manufacturing Sciences," the company is devoted to improving precision machining at the micro-scale level.

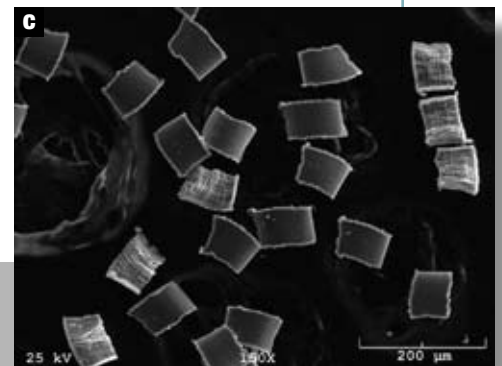
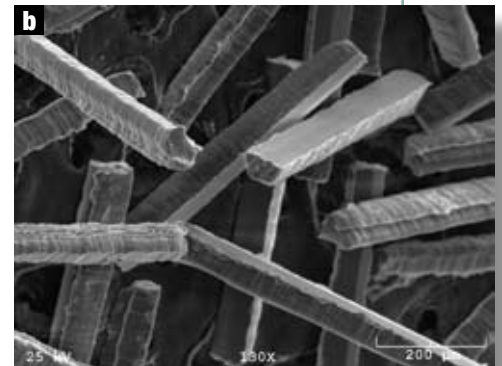
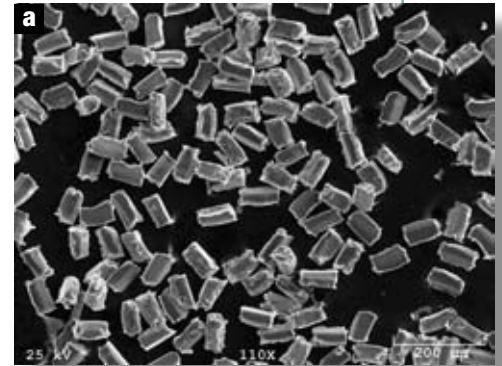
The company utilizes the technology from Mann's research at Purdue called Modulation-Assisted machining to improve the machining of precision components by oscillating [modulating] the cutting tool. It developed a special device that increases productivity in manufacturing precision components like orthopedic implants or fuel injectors. In a unique materials processing application, the technology can produce particulate metals and alloys directly by a controlled machining process. The oscillating process can produce micron-sized metal fibers, platelets, and particles with unique microstructures.

Shortly after its formation, M4 Sciences won the university's 2007 Burton D. Morgan Competition in which students work in multidisciplinary teams to formulate a business startup idea, prepare a business plan, and compete for money to help commercialize the idea.

The experience proved to be invaluable for Mann. The team won \$40,000 in prize money and a springboard for M4 Sciences. "It gave us contacts with many other types of investment, access to other source of capital, leads, contacts, networking, and visibility," Mann says. "The competition honed our perspective on how to move forward as a company by giving us critical feedback from a panel of experienced business professionals."

M4 Sciences, located in the Purdue Research Park, is currently in its third year and has received funding from private investment and grants from both the National Science Foundation and Indiana's 21st Century Research and Technology Fund.

■ **Rebecca Goldenberg**



Images: Scanning electron micrographs of Al 6061-T6 particulate produced by MAM: (a) Equiaxed, (b) needle and (c) platelet shapes. Note the uniformity in size and shape of the particles.

Reference: J.B. Mann, C. Saldana, S. Chandrasekar, W.D. Compton and K.P. Trumble. Scripta Materialia 57 (2007) 909–912.