

Research leads to new technology to protect human health

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Larry Wackett and Michael Sadowsky, members of the University of Minnesota's BioTechnology Institute, developed an enzyme that is used in Bioo Scientific's new MaxDiscovery™ Melamine Test kit, which simplifies the detection of melamine contamination in food. Melamine is an industrial chemical that killed six Chinese children and hospitalized 150,000 last year after it was added to milk to increase its apparent protein content. Some children may have life-long chronic kidney problems resulting from melamine exposure.

Development of the test responds to a call from the World Health Organization (WHO) for a simple, inexpensive method to detect [melamine](#) contamination in infant formula and other liquids. Until now, melamine testing required expensive laboratory equipment and skilled personnel. This kit simplifies the testing and reduces the cost of melamine detection. The MaxDiscovery Melamine Test kit can detect melamine in milk, powdered milk, cream, ice cream and chocolate drink. Bioo Scientific has plans to adapt it to detect melamine in seafood and meat.

Researchers at the BioTechnology Institute (BTI) developed the enzyme, melamine deaminase, used in the MaxDiscovery Melamine Test kit and the enzyme will be produced in the BTI Pilot Plant fermentation facilities. Melamine deaminase works by breaking one of the C-N bonds in melamine to release ammonia, which can be detected by a simple test that turns the liquid blue. Jennifer Seffernick, a research associate in Wackett's lab, discovered the enzyme while conducting research on

biodegradation of s-triazine herbicides. It is one of many examples of how basic research can lead to new technologies that benefit society.

"Development of the melamine enzyme and the test kit is an example of how universities and industry can collaborate to foster basic science, education, and technology that benefits society," says Wackett, who is a Distinguished McKnight University Professor in the College of Biological Sciences.

"Larry Wackett's research has revealed the power of microbial enzymes to modify and destroy toxic substances in the environment," says Joe Krebs, director of Protein Chemistry and Engineering at Bioo Scientific. "Our new enzymatic detection method takes this work in a new direction to provide a better approach for the detection of melamine contamination in the global food supply."

Research to develop the enzyme for the melamine test was supported by the University's Biocatalysis Initiative.

"This is an example of how a small but strategic investment in scientific research can make a big difference," says Robert P. Elde, dean of the College of Biological Sciences and interim director of the Biotechnology Institute.

Melamine was originally used to make durable plastic for dishes and countertops. It is also a widely used additive to cement. But in recent years it has been misused as a food additive because it contains a large amount of nitrogen (a nutrient), is cheap, and is falsely recognized as protein by the most common chemical assay used to test for food protein. This has led to a practice of adding melamine to any food where its value is enhanced by increasing the apparent [protein content](#). For example, melamine-tainted pet food killed nearly 1,000 U.S. pets during one episode in 2007.

Source: University of Minnesota ([news](#) : [web](#))

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