

Public release date: 1-Dec-2005

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Needle-free immunizations

Reducing the risk of cross-contamination from needle reuse

Santa Barbara, California – December 1, 2005 -- Samir Mitragotri, a professor of chemical engineering at the University of California, Santa Barbara, says the myriad shortcomings of injections have led to active research and development of needle-free methods of immunization. While most people prefer to avoid injections, the stakes are enormously higher than just helping people avoid a disagreeable prick of a needle. In third world countries, improper and unsafe use of the needles used in injections causes millions of cases of hepatitis B and hepatitis C, and thousands of HIV infections. The World Health Organization has estimated that as many as one-third of immunization injections are unsafe in four of its six geographical regions.

In a paper published today in *Nature Reviews*, "Immunization Without Needles," Mitragotri reviews in detail the characteristics – and pros and cons – of the currently available methods of immunization, which include topical application to the skin, pills, nasal sprays, injections, and others. Considerable advances have been made in the past decade, especially in transdermal (through the skin) and nasal immunization.

"Unfortunately, because of the development costs of new immunization methods, use of needle-free immunization might initially push the direct cost of immunizations higher," says Mitragotri. "But the secondary costs of needle-based immunization – infection and disease – are high and could be prevented with needle-free methods." Mitragotri says that he anticipates that needle-free methods will reduce the economic burden associated with needle-caused infections, eventually proving to be economically feasible.

A wide range of interdisciplinary researchers and businesses are focusing on needle-free immunization delivery methods, says Mitragotri, helping ensure that needle-free immunizations will eventually be commonly used.

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