Superparamagnetic particles for microfluidic biosensor diagnostics: MagSense Beads for lab-on-a-chip
TechID: MSL10_0802

TECHNOLOGY DESCRIPTION
Early detection of infectious diseases can greatly enhance medical care and limit the spread of emerging diseases. Thus, rapid, sensitive, and inexpensive point-of-care sensors are needed to identify multiple pathogens in complex samples. Nanoparticles have unique properties that make them useful for biological and chemical sensing. We present a new development in nanoparticle synthesis for diagnostic devices: MagSense Superparamagnetic Beads.

UNIQUE BENEFITS
Superparamagnetic microparticles rapidly and efficiently separate cells from complex mixtures. They can be coated with antibodies that react with the cell-line of interest. After a short reaction, a simple permanent magnet can be used to separate the superparamagnetic particles and specific cell type of interest. Unique properties of the MagSense Beads are their more evenly loaded magnetic material and stronger magnetic signal with high recovery but without residual magnetism.

DEVELOPMENT BACKGROUND
MagSense Beads have been studied in magnetophoretic separation, capable of detecting type 2 Dengue virus at a concentration < 10^3 virus per ml in serum, with high sensitivity to their size and magnetic moment. This separation technique employs a translating periodic potential energy landscape to transport magnetic beads horizontally across a substrate. By exploiting this frequency dependence, highly efficient separation of magnetic beads has been achieved based on fractional differences in bead diameter and/or their specific attachment to two microorganisms, i.e., B. globigii and S cerevisiae.

APPLICATIONS
MagSense Beads can facilitate the creation of microfluidic lab-on-a-chip diagnostic tests such as immunoassays and nucleic acid assays with no laboratory support. These diagnostic tools would offer speed, sensitivity, and specificity; as well as ease of use and shelf life. Technical notes include: pre-coated with streptavidin, protein A, or carboxyl groups; sterilizable with autoclave or ethanol; and monodisperse in size (CV<15%).

INVENTORS
Hao Shang, Ph.D., and Gil U. Lee, Ph.D.

PUBLICATIONS
Upon request, we can provide citations from (list of journals)

PATENT STATUS
MagSense Beads technology has patent protection in the United States and patent pending in Europe. Available for exclusive or non-exclusive licensing.

CONTACT
Michelle Travis
Michelle@Biosciencebridge.com
208-319-3624
Please reference TechID: MSL10_0802