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IBM, A*Star co-develop anti-microbial hydrogel

January 24, 2013 | News | By BioSpectrum Bureau



Singapore:Ã?Â Researchers from A*Star's Institute of Bioengineering and Nanotechnology (IBN) and IBM have unveiled first-ever antimicrobial hydrogel that can break apart biofilms and destroy multidrug-resistant superbugs upon contact. Tests have demonstrated the effectiveness of this novel synthetic material in eliminating various types of bacteria and fungi that are leading causes of microbial infections, and preventing them from developing antibiotic resistance. This discovery may be used in wound healing, medical device and contact lens coating, skin infection treatment and dental fillings.

IBN executive director Professor Jackie Y Ying said, "By combining IBN's biomaterials expertise and IBM's experience in polymer chemistry, we were able to pioneer the development of a new nanomaterial that can improve medical treatment and help to save lives."

Bacteria primarily exist as free-floating cells or biofilms. When grouped together, the cells secrete a sticky polymeric substance, which weave and 'glue' the bacteria to surfaces. Compared to free-floating cells, biofilms are 100-1000 times less susceptible to antibiotics due to the acquired resistance from the tightly weaved microbial structure that blocks and prevents drug penetration. More than 80 percent of all human microbial infections are related to biofilm.

The emergence of new strains of superbugs and shortage of new drugs has exacerbated the need for an effective antimicrobial solution. Traditional household antiseptics and disinfectants are also proving to be ineffective in eliminating drug-resistant germs.