Professor publishes on first-ever imaging of cells growing on spherical surfaces

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Shengyuan Yang, Florida Institute of Technology assistant professor of mechanical and aerospace engineering, with graduate student Sang Joo Lee, has published a paper on the first-ever imaging of cells growing on spherical surfaces. The paper is published in the online journal, *Review of Scientific Instruments*, and will appear later in September in the print version.

The potential biomedical applications of the researchers' technique include new strategies and devices for the early detection and isolation of cancer cells, facilitating new methods of treating cancer tissues. "We also foresee new strategies and techniques to control the differentiation of stem cells and the morphologies and structures of the resulting cells and tissues," said Yang.

The effects of substrate stiffness on cell behaviors have been extensively studied; however, the effects of substrate curvature are not well-documented. The curvature of the surface on which cells adhere can have profound effects on cell behaviors, according to Yang.

"To reveal these cell mechano-biological responses to substrate curvatures, we have introduced a novel, simple, and flexible class of substrates, polyacrylamide gels embedded with micro glass balls ranging in diameter from 5 mm to 2 mm, to culture cells. To the best of our knowledge, this is the first experimental attempt to study cell responses to spherically-shaped substrates. Our cell culture experiments imply that this class of substrates, micro glass ball embedded gels, can be useful

tools to study cell mechanobiological responses to substrate curvatures, related cell and tissue engineering researches, and biomedical applications, such as cancer detection and treatment, and the control of stem cell differentiations, for example," said Yang.

This work was supported with funding from the National Science Foundation (NSF) CAREER Program. The reviewer of this paper at Review of Scientific Instruments commented, according to Yang: "This is a clever idea. . . This work has great potentials with high impact."

Provided by Florida Institute of Technology