



**Biophysical Society 62nd Meeting, Feb. 17-21, 2018,
San Francisco, California**

'Local Environment' Plays Key Role in Breast Cancer Progression

While studying the complex correlation between tissue stiffness and breast cancer development, researchers found that cancer cells tend to become more aggressive when the surrounding tissue stiffens.

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For More Information:
AIP Media Line
media@aip.org
301-209-3090

WASHINGTON, D.C., February 21, 2018 -- Breast cancer is the most commonly diagnosed cancer in women -- one in eight (12.4 percent) in the U.S. will be diagnosed with it. Invasive breast cancer is dangerous for two reasons: It can aggressively spread to other organs in the body, and it is likely to recur. While treatable in the early stages via surgery or chemotherapy, as the disease progresses, the chances of recovery decrease exponentially.

Many of the drugs and therapies available today target breast cancer cells but tend to neglect the surrounding "local environment," which includes surrounding tissues. But cancer cells and their local environment are connected, so both undergo striking chemical and physical changes during tumor development.

During the 62nd Biophysical Society Annual Meeting, held Feb. 17-21, in San Francisco, California, Deep Parikh, a doctoral candidate at Stevens Institute of Technology, will present his work exploring the role physical changes within

a cancer cells' local environment play in the aggressiveness of breast cancer.

"Prior attempts to clarify the interactions between breast cancer cells and the local environment ... were mainly done on artificial smooth surfaces ... and yield misleading indications," Parikh said. "I'm studying how the cancerous microenvironment -- especially the physical attributes of tissue stiffness and rigidity -- controls cancer progression."

During tumor development, "the local environment undergoes significant chemical and physical alterations that are regulated by both cancer cells and the cells surrounding the tumor," Parikh said.

Based on clinical observations, an increase of tissue stiffness and rigidity is among the most profound of these physical changes. "More importantly, clinical data suggests that increasing stiffness may lead to tumor aggressiveness and cause it to spread to other organs," Parikh said.

As a better way to explore the role of tissue stiffness in cancer aggressiveness -- independent of the chemical alterations -- Parikh and colleagues developed a biomimetic platform that mimics the stiffness of the local environment from healthy "soft" breast tissue to cancerous "stiff" tissue.

"Our platform is easy to manipulate and can be tuned to accommodate a range of stiffness that corresponds to the gradual changes that occur during cancer development," Parikh said. "It allows us to encode the complex correlation between tissue stiffness and cancer development."

Culturing breast cancer cells on surfaces of different stiffness resulted in cells with different biological structures. "The cells inclined toward being more aggressive -- metastatic (spreading to other organs) -- as stiffness increased," Parikh said. "Strikingly, the data obtained after three and seven days' culture was significantly different than previous studies carried out for less than 24 hours. Also, with increased stiffness the drug resistance of the breast cancer cells increased -- which suggests that drugs designed to target merely at a cellular level are not enough."

This new approach to cancer therapeutics offers significant promise for future drug development. "Developing drugs that can potentially prevent an increase in stiffness can most likely stop the spread of cancer," Parikh said. "Localizing it would allow it to be easily removed using surgical techniques."

3230-Pos, Board B438 - "Matrix stiffness regulates the fate of breast cancer cells" is authored by Deep Parikh, Mary Stack and Hongjun Wang. It will be displayed at 10:30 a.m. PST, on Wednesday, Feb. 21, 2018, in the South Hall ABC of the Moscone Center, South. Abstract: <https://plan.core-apps.com/bpsam2018/abstract/ea4b4250733473141a814abfd980b1c>



MORE MEETING INFORMATION

ABOUT THE MEETING

Each year, the Biophysical Society Annual Meeting brings together more than 6,000 researchers working in the multidisciplinary fields representing biophysics. With more than 3,600 poster presentations, over 200 exhibits, and more than 20 symposia, the BPS Annual Meeting is the largest meeting of biophysicists in the world. Despite its size, the meeting retains its small-meeting flavor through its subgroup symposia, platform sessions, social activities and committee programs. The 62nd Annual Meeting will be held at the Moscone Center (South) in San Francisco, California.

PRESS REGISTRATION

The Biophysical Society invites professional journalists, freelance science writers and public information officers to attend its Annual Meeting free of charge. For press registration, contact Ellen Weiss at EWeiss@biophysics.org or the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

NEWS RELEASES

Embargoed press releases describing in detail some of the breakthroughs to be discussed at the meeting are available on EurekAlert!, Newswise and Alpha Galileo or by contacting the Media Line at the American Institute of Physics at media@aip.org or 301-209-3090.

QUICK LINKS

Main Meeting Page: <https://www.biophysics.org/2018meeting/Home/tabid/7117/Default.aspx>

Symposia:

<https://www.biophysics.org/2018meeting/Program/ScientificSessions/Symposia/tabid/7192/Default.aspx>

Desktop Planner:

<http://www.biophysics.org/2018meeting/GeneralInfo/MobileApp/tabid/7473/Default.aspx>

ABOUT THE SOCIETY

The Biophysical Society, founded in 1958, is a professional, scientific Society established to encourage development and dissemination of knowledge in biophysics. The Society promotes growth in this expanding field through its annual meeting, monthly journal, and committee and outreach activities. Its 9,000 members are located throughout the U.S. and the world, where they teach and conduct research in colleges, universities, laboratories, government agencies, and industry. For more information on the Society, or the 2018 Annual Meeting, visit <http://www.biophysics.org>.