

Quantum Dots Deliver Vitamin D to Tumors for Possible Inflammatory Breast Cancer Treatment

Philadelphia, Pa. – The shortened daylight of a Maine winter may make for long, dark nights – but it has shone a light on a novel experimental approach to fighting inflammatory breast cancer (IBC), an especially deadly form of breast cancer.

The new approach enlists the active form of Vitamin D3, called calcitriol, which is delivered therapeutically by quantum dots. Quantum dots are an engineered light-emitting nanoscale delivery vehicle. This new preliminary work shows the dots can be used to rapidly move high concentrations of calcitriol to targeted tumor sites where cancer cells accumulate, and also through the lymph system where the cancer spreads. With this approach, the calcitriol can fight on multiple fronts and the targeted location can be visualized with an imaging system tracking the quantum dots. The research will be presented at the 57th Annual Meeting of the Biophysical Society (BPS), held Feb. 2-6, 2013, in Philadelphia, Pa.

University of Delaware cancer researcher Anja Nohe was living in Maine when she first received funding from the Maine Cancer Foundation to determine the effect of calcitriol on breast cancer cells. Reading cancer literature helped her make connections between cancer, vitamin D, and the daylight regime of higher latitudes. "By talking with talented colleagues about these ideas, the foundation was set for the current project," she says. After moving to the University of Delaware, she began working with Kenneth Van Golen, "an expert in the biology of IBC," to evaluate calcitriol.

Compared to other forms of breast cancer, IBC is especially difficult to treat. It has a five-year survival rate of 40% versus 87% for all other breast cancers. A big part of what makes IBC treatment difficult is its multi-site growth pattern. Current aggressive treatments such as combinations of chemotherapy, surgery and radiation, have failed to significantly improve IBC survival rates.

This early experimental work on mice is encouraging because data show calcitriol can inhibit invasion and migration of SUM149 cells, an IBC cell line. "New IBC therapies are urgently needed, which is why the goal of my work is to find a successful treatment for inflammatory breast cancer, especially one with fewer side effects," Nohe says.

Presentation #2953-Pos, "Using calcitriol conjugated quantum dots to target inflammatory breast cancer tumors and metastasis in vivo," will take place at 10:30 a.m. on Wednesday, Feb. 6, 2013, in the Pennsylvania Convention Center, Hall C. ABSTRACT: <http://tinyurl.com/acw94xg>

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This news release was prepared for the Biophysical Society (BPS) by the American Institute of Physics (AIP).

ABOUT THE 2013 ANNUAL MEETING

Each year, the Biophysical Society Annual Meeting brings together over 6,000 research scientists in the multidisciplinary fields representing biophysics. With more than 3,900 poster presentations, over 200 exhibits, and more than 20 symposia, the Annual Meeting is the largest meeting of biophysicists in the world. Despite its size, the meeting retains its small-meeting flavor through its subgroup meetings, platform sessions, social activities, and committee programs.

The 57th Annual Meeting will be held at the Pennsylvania Convention Center (1101 Arch Street, Philadelphia, PA 19107). For maps and directions, please visit:

<http://www.paconvention.com/explore-philadelphia/directions-and-parking>.

QUICK LINKS

Meeting Home Page:

<http://www.biophysics.org/2013meeting/Main/tabid/3523/Default.aspx>

Housing and Travel Information:

<http://www.biophysics.org/2013meeting/AccommodationsTravel/HotelInformation/tabid/3621/Default.aspx>

Program Abstracts and Itinerary Planner:

<http://www.abstractsonline.com/plan/start.aspx?mkey=%7B763246BB-EBE4-430F-9545-81BC84D0C68C%7D>

PRESS REGISTRATION

The Biophysical Society invites credentialed journalists, freelance reporters working on assignment, and public information officers to attend its Annual Meeting free of charge. For more information on registering as a member of the press, contact BPS Director of Public Affairs and Communications Ellen Weiss at eweiss@biophysics.org or 240-290-5606, or visit

<http://www.biophysics.org/2013meeting/Registration/Press/tabid/3619/Default.aspx>. Press registration will also be available onsite at the Pennsylvania Convention Center in the Biophysical Society's meeting office, Room 304VIP.

ABOUT BPS

The Biophysical Society (BPS), 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 9000 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 2013 Annual Meeting, visit www.biophysics.org.

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