Report from active participation in San Antonio Breast Cancer Symposium, December 9th –13th, 2014, San Antonio, Texas, USA – Malgorzata Bajor

The **2014 San Antonio Breast Cancer Symposium** is annual meeting presented by the Cancer Therapy & Research Center at UT Health Science Center San Antonio, the American Association for Cancer Research, and Baylor College of Medicine. The driving force behind this collaboration is the shared mission of the organizations to advance progress against breast cancer. As exciting strides are made in the field of breast cancer research and treatment the program continues to present essential up-to-the minute information combined with engrossing discussion for basic, translational and clinical cancer research professionals. The SABCS is recognized as the most important in field of breast cancer conference and is extremely well attended by scientists from all over the world. During this conference I had an opportunity to hear state-of-the-art lectures and breakthrough discoveries authored by leading clinicians and researchers, whose contributions have left significant and lasting marks in the field of breast cancer. Moreover, the goal of this meeting was to provide a platform for sharing newest results in broad range of basic, translational and clinical research related with breast malignancies. I had a pleasure to present our data during Poster Session 5 entitled: 'Tumor Cell and Molecular Biology: Cellular Mechanisms'.

Title of the poster: **Adenanthin, a new peroxiredoxin inhibitor, induces a switch between estrogen receptor alpha-mediated and Src/Akt-driven signaling in breast cancer cells**

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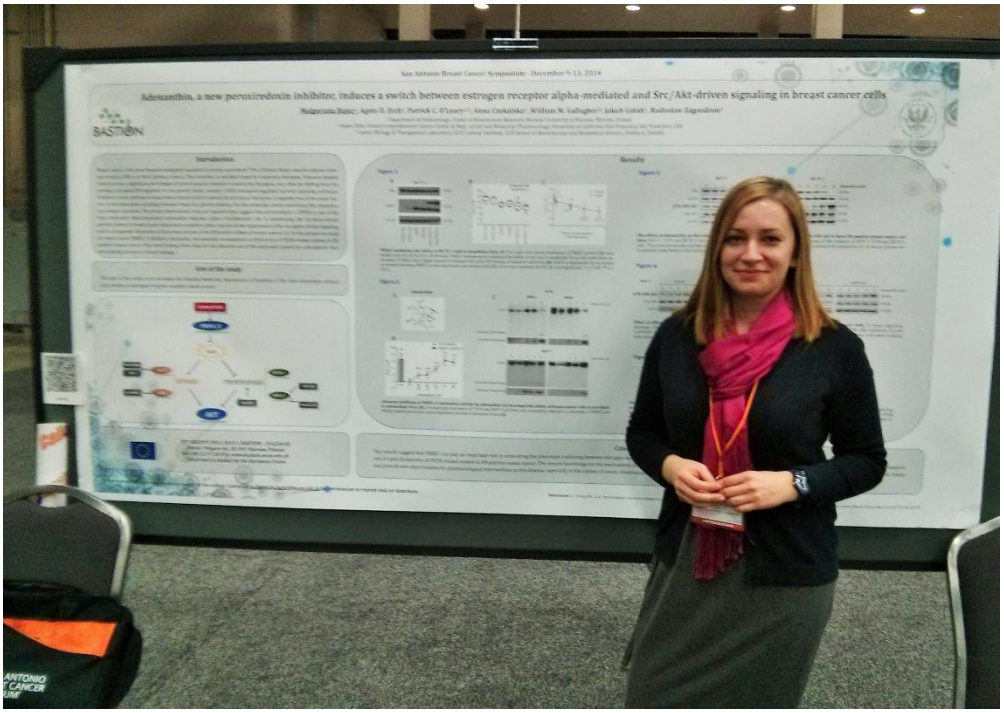
Increasing evidence indicates that oxidative stress is involved in the progression of estrogen receptor (ER)-positive breast cancer. Moreover, the oxidative stress-related gene expression signature has been suggested to correlate with therapy resistance and poorer outcome in breast cancer. Therefore, it is crucial to determine the antioxidant defense mechanisms that are utilized by breast cancer cells to regulate oxidative stress. In our study we evaluate the role of peroxiredoxin 1 (PRDX1) which is one of the most prevalent hydrogen peroxide scavenging enzymes in mammalian cells. Our recent studies indicated that PRDX1 is an independent biomarker of favorable prognosis in ER-positive breast cancer. Our results indicate the mechanistic link between PRDX1 and ERα in breast cancer and suggest a role for PRDX1 in mammary carcinogenesis. We provide a molecular explanation for this phenomenon in the current project.

To evaluate the importance of PRDX1 activity in ER-positive breast cancer, we have used adenanthin, a newly described PRDX1/2 inhibitor. In our studies, we have shown that adenanthin strongly inhibits metabolism of exogenous hydrogen peroxide by breast cancer cells. This phenomenon is

accompanied by a shift from H_2O_2-degrading PRDX1 dimers into enzymatically inactive monomers and by a dramatic

decrease of ERα protein presence in the cells. Moreover, we have observed that incubation of ER-positive breast cancer cells with adenanthin leads to a marked increase in phosphorylation status of proteins associated with Src-Akt-driven signaling in breast cancer. Thus, our results suggest that PRDX1 can play an important role in controlling the switch between estrogen receptor- and growth factor-driven signaling in breast cancer.

In summary, in our studies we describe for the first time molecular consequences of rapid dysfunction of PRDX-related system in ER-positive breast cancer. The deeper knowledge on the mechanisms of PRDX1 functioning can change our understanding of the events leading to the progression of ER-positive breast cancer and provide new opportunities for pharmacological interventions in this disease, especially in the context of recent observations connecting the oxidative stress and resistance to endocrine therapy.



Dr M. Bajor at the poster during poster session