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DNA damage/repair signaling and breast cancer risk

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Abstract

This is the first study to evaluate double strand breaks (DSBs) damage/repair signaling, measured as H2AX phosphorylation (γ-H2AX) in breast cancer risk. In 64 breast cancer cases and 71 controls, basal or IR-induced γ-H2AX level did not differ between breast cancer cases (mean±SD, 6.65±1.18; 29.23±6.88) and controls (6.48±0.95; 27.19±7.26). However, in subgroup analysis of women with younger age at first live birth (<24), breast cancer cases have a significantly higher IR-induced γ-H2AX level (29.87±6.45) than that in controls (26.60±7.19). In cases, African Americans (AA) had a significantly higher IR-induced γ-H2AX level (32.17±6.76) than that in Caucasians (28.08±6.65), particularly in the younger age group (<50), never smokers, negative family history (FH), and higher body mass index (BMI>25 kg/m^2). In younger cases, a higher γ-H2AX was observed in AA (p=0.042) compared to Caucasians (32.71±5.43 vs. 27.32±5.33). In never smokers, AA cases had a significantly higher level of IR-induced γ-H2AX than Caucasians (32.70±5.77 vs. 27.58±6.41, p=0.03). In cases without FH, AA had a significantly higher level of IR-induced γ-H2AX than Caucasians (32.38±6.90 vs. 28.02±7.09, p=0.044). In cases with a higher BMI, AA had a significantly higher level of IR-induced γ-H2AX than Caucasians (33.36±5.94 vs. 26.93±6.00, p=0.001). Our results, although based on a relatively small group of subjects, indicate that DSBs response is significantly higher in AA breast cancer cases. Future larger studies are warranted to test whether this racial/ethnic difference in IR-induced γ-H2AX levels contribute to breast cancer risk, tumor phenotypes, treatment response, and/or clinical outcomes.

Biography

Jennifer J. Hu has completed her Ph.D. from UMDNJ-New Jersey Medical School and postdoctoral studies from Rutgers University School of Medicine. She currently serves as the Associate Director of Cancer Prevention and Control at the Sylvester Comprehensive Cancer Center and the Sylvester Professor of the University of Miami School of Medicine. She has published more than 65 papers in high-impact journals and served as a reviewer in multiple journals and NIH/NCI/DOD study sections. Her research mainly focuses on the application of molecular and genetic epidemiology in predicting human cancer risk assessment, treatment response, and clinical outcomes.

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