P6

CIRCULATING MICRORNA PATTERN DEFINES A BIOLOGICALLY DISTINCT BREAST CANCER PATTERN IN BLACK (B) WOMEN RELATIVE TO ONE OCCURRING IN WHITE (W) WOMEN

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10.1136/jim-2016-000080.46

Purpose of Study Black women with triple negative breast cancer have 46% lower survival rates attributed to differences in tumor biology. We analyzed presurgical plasma microRNA of white (W) and black (B) women with TNBC enrolled in our breast ovarian tissue bank between 2004 and 2014.

Aims Detect microRNA patterns in pre-surgical plasma of TNBC W or B

Analyze differences by integrated approach to detect pathways differentially activated in the two groups.

Methods Used Between 2004 and 2014 we investigated patterns of plasma miRNAs collected before, after surgery, during and after chemotherapy in 67 patients presenting for surgery for breast cancer (W=44 & B=44) and 25 age and race matched normal controls. Two-sample t-test was used for all 2-sample comparison and ANOVA followed by Benjamin Hochberg post-hoc test to compare the mean response between subject factors of interest. All tests were 2-tailed and results with a $p < 0.05$ were considered statistically significant. Coremine was used to identify datasets in breast cancer microarray with emphasis on our differentially expressed circulating miRs.

Summary of Results Mean age cancer 48 (range 35–78), control 44 (range 35–67): B patients did not express over 70% of pre-surgical plasma miRs over-expressed in the W pre-surgical plasma. Black patients had lower expression of MiRs: –16-5p, –484, –126, –150-5p, –142-3p; –30c-5p, –186-5p, 139-5p. Samples from white patients overexpressed miRs –126, –150-5p, –142-3p; –30c-5p, –186-5p, 139-5p compared to healthy controls. These miRs significantly suppressed in blacks $p < 0.05$.

Coremine text mining suggests differentially regulated microRNA are involved in mitochondrial quality control and biogenesis.

Conclusions Deregulation in circulating miRs between B and W patients point to pathways involved in mitochondrial fission and fusion. Aberrant mitochondria biogenesis was reported as mechanism for cancer stem cell survival and detrimental to innate immunity. Such pathways could explain the lower survival seen in black breast cancer patients.