УНИВЕРЗИТЕТ У НОВОМ САДУ
UNIVERSITY OF NOVI SAD

TOP ACHIEVEMENTS 2021

FACULTY OF MEDICINE

Published paper

Redox Biology

Associate Professor Mirjana Udicki, Full Professor Biljana Srdić Galić

One of the underlying mechanisms that could link breast cancer and obesity is shifted redox homeostasis in the tumor microenvironment. To reveal the relationship between the malignant phenotype and obesity, we compared redox profiles of breast tumor and tumor-associated adipose tissue from premenopausal women: normal-weight with benign tumors, overweight/obese with benign tumors, normal-weight with malignant tumors, and overweight/obese with malignant tumors. Namely, we examined the protein expression of nuclear factor erythroid 2-related factor 2 (Nrf2), protein expression and activity of main antioxidant defense (AD) enzymes: copper, zinc- and manganese superoxide dismutase, catalase, and glutathione peroxidase, as well as the level of 4-hydroxy-2-nonenal (4-HNE) modified proteins. Higher protein expression and activity of AD enzymes were found in malignant tumor tissue than benign tumor tissue, irrespective of obesity. Nevertheless, malignant tumor tissue of overweight/obese women was characterized by higher protein expression of Nrf2 and weaker immunopositivity for 4-HNE modified proteins. In malignant tumor-associated adipose tissue, the redox profile was clearly related to obesity. Higher Nrf2 protein expression and higher AD enzyme levels were observed in normal-weight women, while stronger immunopositivity for 4-HNE modified proteins was found in overweight/ obese women. The results suggest that the complex interplay between obesity and malignancy involves redoxsensitive pathways in breast tumor and tumor-associated adipose tissue.