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Authors: Barbara Pasculli, Raffaella Barbano, Paola Parrella

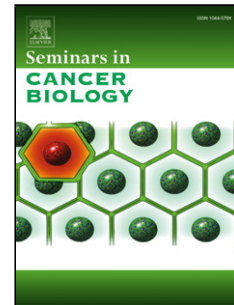
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Epigenetics of Breast Cancer: biology and clinical implication in the era of Precision Medicine.

Barbara Pasculli¹, Raffaella Barbano¹, Paola Parrella¹.

Laboratory of Oncology, IRCCS “Casa Sollievo della Sofferenza”, 71013 San Giovanni Rotondo (FG).

Co authors e-mails b.pasculli@operapadrepio.it, r.barbano@operapadrepio.it

Corresponding author: Paola Parrella, MD, Laboratory of Oncology, IRCCS “Casa Sollievo della Sofferenza”, 71013 San Giovanni rotondo (FG), e.mail: pparrella@operapadrepio.it, Tel: +39 0882416261, Fax: +39 0882416264

Abstract

In the last years, mortality from breast cancer has declined in western countries as a consequence of a more widespread screening resulting in earlier detection, as well as an improved molecular classification and advances in adjuvant treatment. Nevertheless, approximately one third of breast cancer patients will develop distant metastases and eventually die for the disease. There is now a compelling body of evidence suggesting that epigenetic modifications comprising DNA methylation and chromatin remodeling play a pivotal role since the early stages of breast cancerogenesis. In addition, recently, increasing emphasis is being placed on the property of ncRNAs to finely control gene expression at multiple levels by interacting with a wide array of molecules such that they might be designated as epigenetic modifiers. In this review, we summarize the current knowledge about the involvement of epigenetic modifications in breast cancer, and provide an overview of the significant association of epigenetic traits with the breast cancer clinicopathological features, emphasizing the potentiality of epigenetic marks to become biomarkers in the context of precision medicine.

List of Abbreviations

BC: Breast Cancer

ER: Estrogen Receptor

PgR, PR: Progesteron Receptor

HER-2: Human Epidermal growth factor Receptor 2

TNBC: Triple Negative Breast Cancer

ncRNA: non coding RNA

CpG(s): Cytosine-phosphate-Guanine dinucleotide(s)

5-me-C: 5-methyl-Cytosine

DNMT(s): DNA-Methyl Transferase(s)

DH: Ductal Hyperplasia

ADH: atypical hyperplasia

DCIS: *in situ* carcinoma

BRCA1: breast cancer 1 gene

PFS: Progression-Free Survival

DSS Disease Specific Survival

OS: Overall Survival

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