# Proteins and Cytokines of Blood Cells Supernatant and Histological Atypical Cells Markers in the Breast Diseases

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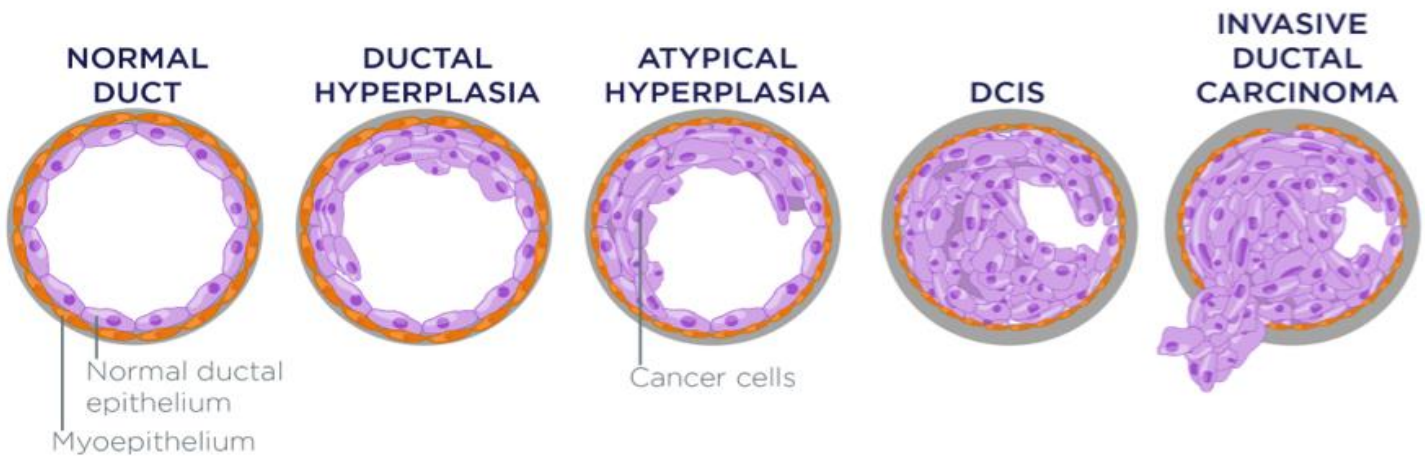
## MOTIVATION AND AIM

- Benign breast diseases (BBD) increase risk of malignant transformation [1].
- BBD play different role in the emergence of atypical cells and their malignancy and can be divided into two groups: BBD with low-risk and with high-risk of malignant transformation [2].

It is possible that the following histological markers of atypical cells: type II collagen (CII), integrin β-1 (CD29), e-cadherin (CDH1) and assessment of concentration of cytokines and proteins integral for tumor progression: histidine rich glycoprotein (HRG), plasminogen activator inhibitor-1 (PAI-1), estrogen receptor-α (ERα), progesterone receptor (PGR), CDH1 can be used to identify features of BBD and breast cancer.




1. J.P. Bates, R. Derakhshandeh, L. Jones, T.J. Webbcorresponding. "Mechanisms of immune evasion in breast cancer". BMC Cancer. 2018. v. 18. pp. 556.
2. M. Zendehdel, F. Salamat, B. Niakan, A. Keshtkar, E. Rafiei. "Subtypes of Benign Breast Disease as a Risk Factor of Breast Cancer: A Systematic Review and Meta Analyses". (2018) Iran J. Med. Sci. v. 43 № 1. pp.1-8.

## MATERIALS

Invasive breast carcinoma of no special type (IBC-NST)
N = 46

- IBC-NST with metastasis in lymph nodes
  N = 17
- IBC-NST without metastasis in lymph nodes
  N = 29

Benign breast diseases (BBD)
N = 37

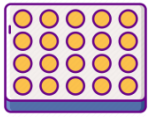
- BBD with low-risk of malignant transformation
  N = 19
  – non-proliferative fibrocystic breast change without atypia
  – fibroadenoma
- BBD with high-risk of malignant transformation
  N = 18
  – proliferative fibrocystic breast changes with/without atypia
  – atypical hyperplasia

## METHODS

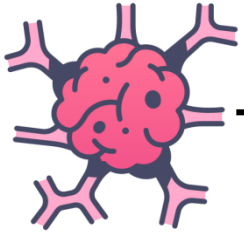
**Blood sample**

**1. Spontaneous production (S)**
DMEM-F12 medium
**2. Mitogenic stimulation**
Polyclonal activators (PA):
– PHA (4 μg/mL)
– ConA (4 μg/mL)
– LPS (2 μg/mL)

**ELISA in supernatants**
IL-2, IL-6, IL-8, IL-10, IL-12, IL-17, IL-18, IL-1β, IL-1Ra, TNF-α, IFN-γ, G-CSF, GM-CSF, VEGF, MCP-1, HRG, PAI-1, CDH1, ERα, PGR

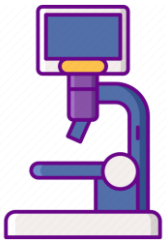


**Index of PA influence (IPAI)**
IPAI = A/B
A – PA production of cytokine
B – S production of cytokine



**Tissue sample**

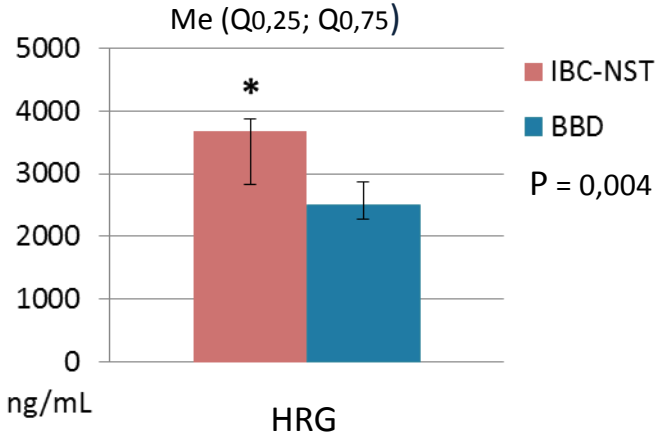
**IHC assay of the expression of**
1. CII
2. CD29
3. CDH1



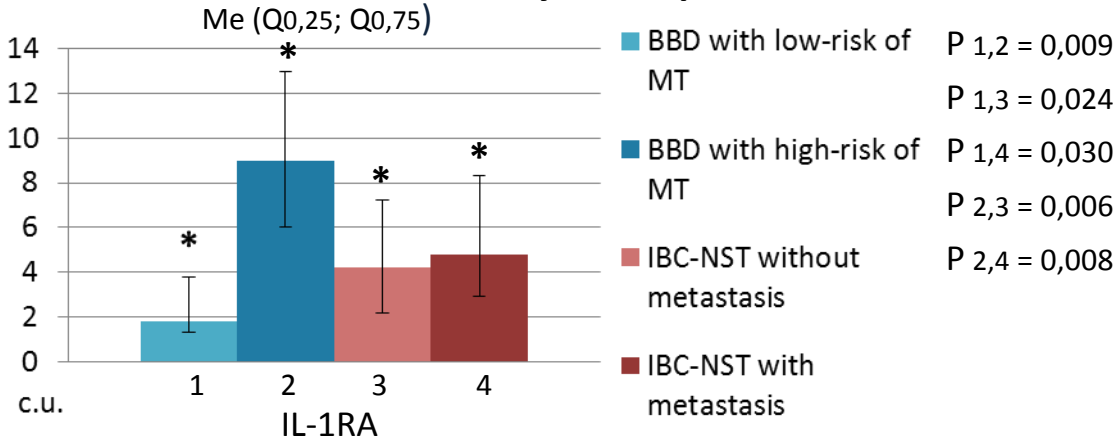
**Analysis of the data**

# RESULTS

## The concentration of HRG

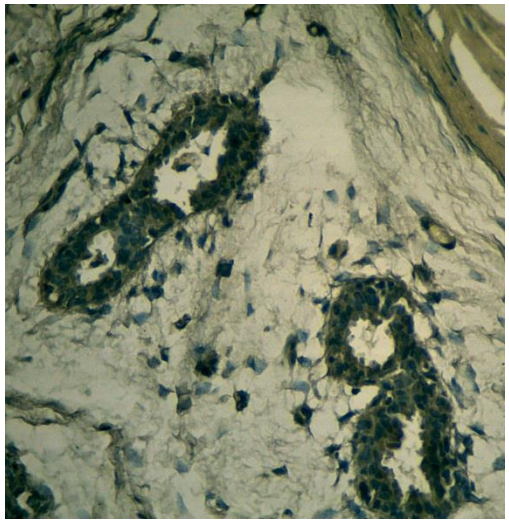



## Index of PA influence on cytokine production



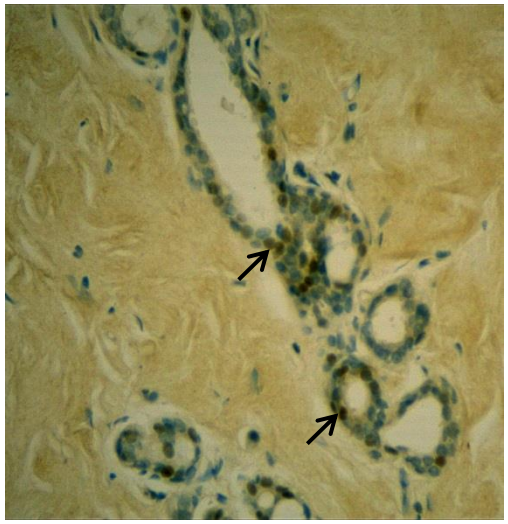

## Expression of the CD29

1



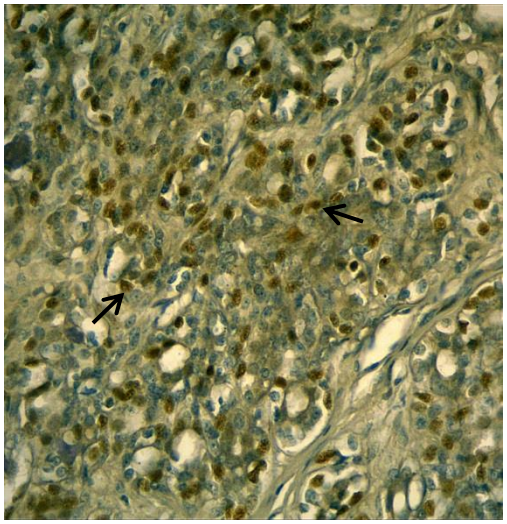
BBD with low-risk of malignant transformation x400

2



BBD with high-risk of malignant transformation x400

3



IBC-NST x400

P 1,2 = 0,045
P 1,3 = 0,017
P 2,3 = 0,037