



# Are Immunologic Responses To Implants Translated From Capsule To Breast Tissue? An Analysis Of Immunophenotypes In Breast Revision Versus Implant Naïve Breast Tissue

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## Introduction

Historically, there has been public concern that breast implants may be associated with breast cancer. In actuality, women with cosmetic breast implants have lower rates of future breast cancer. We hypothesized that peri-implant inflammation may induce breast cancer immunosurveillance to protect against breast cancer. **The capsule inflammatory milieu has been well-characterized, but whether this inflammatory response extends beyond capsule to the breast parenchyma has not been studied.**

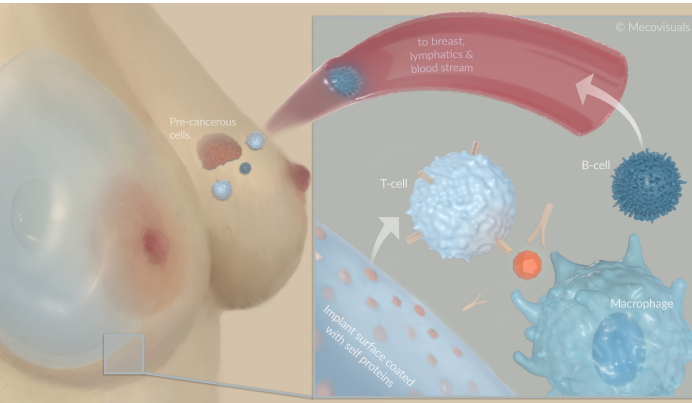


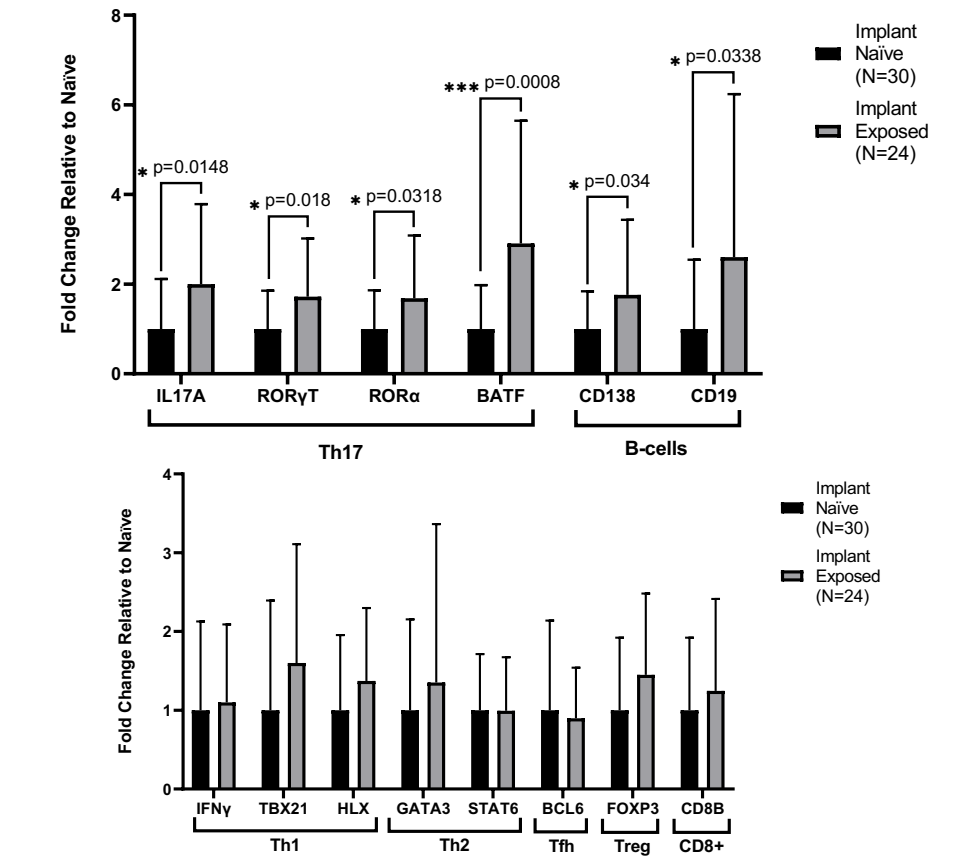
Figure 1. Diagrammatic illustration of the hypothesis.

## Objectives

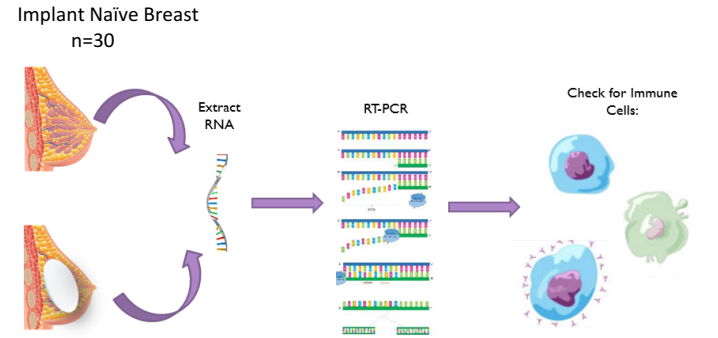
To compare immune cell target gene expression levels in the breast tissue of women with and without breast implants.

## Results

qRT-PCR data showed elevated expression of genes specific to Th17 cells and B cells in revision breast tissue (implant exposed group). Fold change for gene expression of the implant exposed group relative to the implant naïve group was found to be 2.00x for IL17A ( $p=0.0148$ ), 1.72x for ROR $\gamma$ t ( $p=0.0180$ ), 1.68x for ROR $\alpha$  ( $p=0.0318$ ), 2.91x for BATF ( $p=0.0008$ ), 1.76x for CD138 ( $p=0.0340$ ), and 2.60x for CD19 ( $p=0.0338$ ). Gene expression levels were not significantly different between groups for Th1, Th2, Tfh, Treg, and CD8+ T cell genes.



## Methods



Breast tissue was collected from patients undergoing first time breast augmentation ( $n=30$ ) and secondary breast revision ( $n=24$ ). Total RNA was isolated and converted to complementary DNA. qRT-PCR was performed using iTaq Universal SYBR Green Supermix (Bio-Rad). Gene specific targets were designed for CD4+ (Th1, Th2, Th17, Tfh, Treg), CD8+, and B cells. Immune target gene expression levels were normalized by GAPDH levels and expressed as fold change relative to the implant naïve group. Groups were compared with unpaired t-tests using Graphpad Prism v9.1.2.

## Conclusion

Peri-implant inflammatory changes extend beyond capsule to breast parenchyma. Further studies will elucidate whether these immune cells serve in a cancer immunosurveillance capacity.



<sup>1</sup>Noels EC, Lapid O, Lindeman JH, Bastiaannet E. Breast implants and the risk of breast cancer: a meta-analysis of cohort studies. *Aesthet Surg J.* 2015;35(1):55-62.