



Novel TRPS1 Zeta-Antibody ZR382 Recognizes Triple-Negative Breast Carcinomas

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SUMMARY:

The predominantly nuclear zinc-finger protein TRPS1 is significantly overexpressed in breast cancer and contributes to breast carcinogenesis and malignant transformation of breast tissue. The novel TRPS1 Zeta-Antibody ZR382 recognizes TRPS1 predominantly expressed in triple-negative breast cancer (TNBC) but also normal breast tissue as well as carcinoma and therefore represents a unique potential in the assessment of mammary cancer variations.

The tumorigenic TRPS1, which is named after its function in the tricho-rhino-phalangeal syndrome manifesting in skeletal abnormalities, is a soluble protein that predominantly resides in the cell nucleus. TRPS1 protein was observed to be overexpressed in TNBC breast carcinoma and osteosarcomas, contributing breast carcinogenesis and progression (Fig. 1).^{1,2}

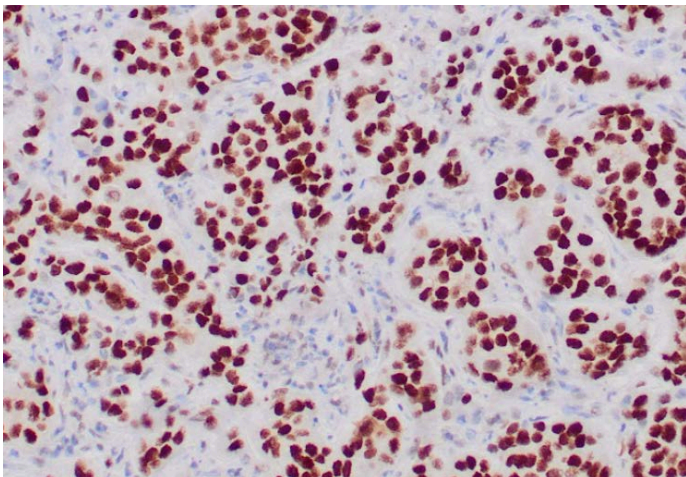


Figure 1: Zeta-Antibody ZR381 against nuclear TRPS1. IHC staining of TRPS1 in human breast carcinoma. Image property of Zeta Corporation.

Other than the breast cancer-relevant factors HER2/neu, ER, and PR, TRPS1 is not only observed overexpressed in TNBC but is considered a breast cancer driver by engaging with H3K9me3 modified heterochromatic replication origins facilitating replication of repressive extrachromosomal circular DNA.¹

TRPS1 expression was reported in TNBC, metaplastic breast carcinoma, borderline phyllodes tumor, osteosarcoma, and brain metastasis.^{2,3}

The TRPS1 Zeta-Antibody ZR382 maps to the C-terminus of the TRPS1 antigen, which encodes the functionally important zinc finger domains IKAROS and GATA as well as a nuclear localization sequence (NLS), respectively (Fig. 2).⁴

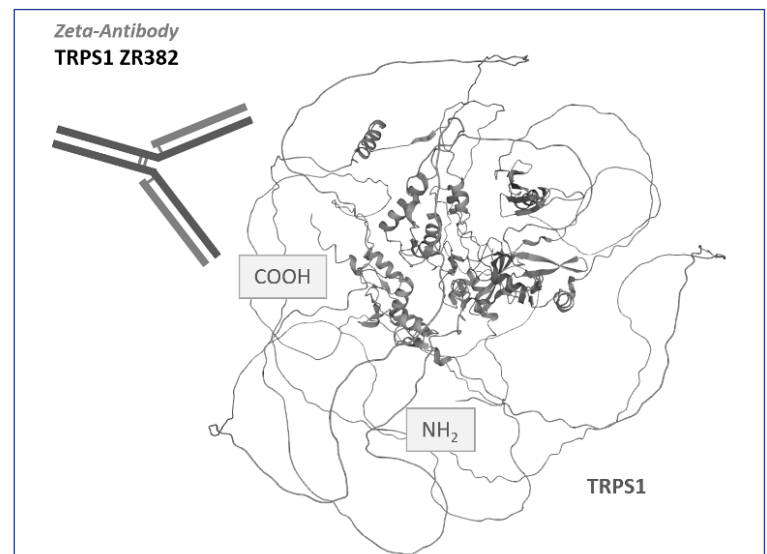


Figure 2: TRPS1 Zeta-Antibody ZR382 maps to the C-terminus of TRPS1 protein. Illustration of TRPS1 Zeta-Antibody ZR382 binding region in TRPS1 protein.⁴ Illustration courtesy of AH.

Interestingly, TRPS1 is observed in opposing balance with GATA3 therefore resulting in a unique and restricted TRPS1 expression pattern reducing risk liabilities by cross presentation in other tissues.

References:

1. Yang, J. *et al.* TRPS1 drives heterochromatic origin repriming and cancer genome evolution. *Cell Rep* **34**:108814 (2021).
2. Ai, D. *et al.* TRPS1: a highly sensitive and specific marker for breast carcinoma, especially for triple-negative breast cancer. *Mod Pathol* **34**:710-719 (2021).
3. <https://www.pathologyoutlines.com/topic/stainsTRPS1.html>
4. <https://www.uniprot.org/uniprotkb/Q9UHF7/entry#structure>