



### PRODUCT FOCUS -- Tools used in the diagnosis of TNBC

**Triple Negative Breast Cancer (TNBC) Awareness Day, March 3** – In the United States, breast cancer is the most common type of non-skin cancer in women, accounting for 30% of all new cancer cases, second only to lung cancer as a cause of cancer death. Approximately one in eight will develop breast cancer during her lifetime. More than 40,000 died of the disease in 2024. (*American Society for Cancer Research, AACR*)

**TNBC** is more aggressive and faster-growing than other breast cancers and is likely to spread and recur. TNBC lacks three key receptors commonly found in other breast cancers: Estrogen receptors (ER-negative), Progesterone receptors (PR-negative), and HER2 protein (HER2-negative). The loss of function of these receptors makes TNBC more aggressive, and treatments that rely on the receptor pathways are ineffective. **TRPS1** is highly expressed in TNBC and is a sensitive and specific marker for all types of breast carcinomas, especially TNBC.

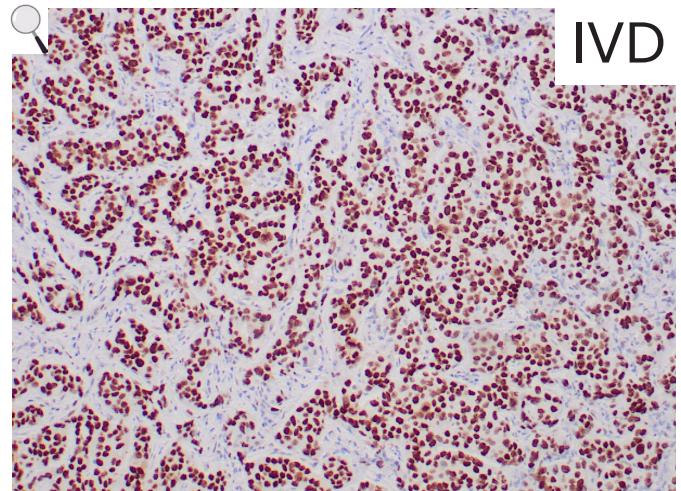
Zeta Corporation offers recombinant RABMono™ (Rabbit Monoclonal) and MonoMAB™ (Mouse Monoclonal) recombinant IVD antibodies researched and developed for the anatomic pathology market for Immunohistochemistry. Zeta is incorporating highly sensitive technology to develop many of these primary antibodies that are target-validated and characterized for IHC on FFPE tissue sections. Zeta provides 400+ IVD antibodies for cancer screening and diagnosis.

### TRPS1, clone ZR382, recombinant -- a specific and sensitive marker for all breast cancers, especially TNBC

Currently there is no highly specific and sensitive marker to identify breast cancer—the most common malignancy in women. Breast cancer can be categorized as estrogen receptor (ER)/progesterone receptor (PR) positive luminal, human epidermal growth factor receptor 2 (HER2) positive, or **triple-negative breast cancer (TNBC)** types based on the expression of ER, PR, and HER2. Currently GATA3, mammaglobin, and GCDFP15 are the most widely used tumor markers to determine the breast origin, and which have been shown to be excellent markers for ER positive and low-grade breast cancer. That said, these markers do not work well for TNBC, providing sensitivity as low as <20% in metaplastic breast carcinoma. Providing additional information for TNBC tumors, TRPS1 is a fairly new marker showing relevance in TNBC.

**Tricho-Rhino-phalangeal Syndrome Type 1 (TRPS1)**, named for its association with the autosomal dominant genetic disorder TRPS1, has been found to be a critical modulator in mesenchymal-to-epithelial transition during the development and differentiation of several types of tissue, including cartilage, bone, kidney, and hair follicle. Recently, TRPS1 was identified to be a novel GATA transcriptional factor, functioning as an essential regulator for growth and differentiation of normal mammary epithelial cells and possibly involved in the development of breast cancer.

A recent study showed that TRPS1, which is highly expressed in triple-negative breast carcinoma (TNBC), was significantly higher than GATA3 expression in metaplastic (85% vs. 21%) and nonmetaplastic (86% vs. 51%) TNBC. Among non-breast tumors, TRPS1 is only expressed in some cases of lung squamous cell carcinoma, urothelial carcinoma (<2%), and ovarian adenocarcinoma. Therefore, TRPS1 has been found to be a highly specific and sensitive marker for all types of breast carcinomas, especially TNBC.



**IHC:** Formalin-fixed, paraffin-embedded human breast carcinoma stained with anti-TRPS1 antibody using peroxidase-conjugate and DAB chromogen. Note the nuclear staining of tumor cells.

#### References:

1. Ai D, et al. *Mod Pathol* 2021; **34**:710-719.
2. Gornelissen LM, et al. *Genes Dev* 2020; **34**:179-193.
3. Radvanyi L, et al. *PNAS* 2005; **102**:11005-11010.

#### TRPS1 rabbit monoclonal antibody

**Clone:** ZR382

**Cat#:** Z2673

[Related TNBC IVD Antibodies >>>](#)

## Related TNBC IVD Antibodies

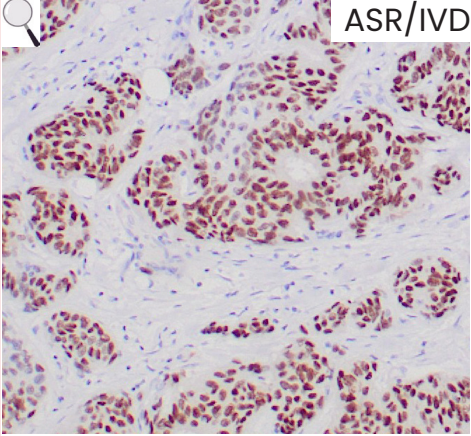
### ER (Estrogen Receptor; clone ZR147)

Recombinant. Recognizes ER (Estrogen Receptor). ER is present in the nuclei of epithelial cells in normal breast and endometrial tissues and a subset of breast carcinomas and acts as a tumor marker, preferentially in combination with an antibody to the Progesterone Receptor (PR) in the classification of adenocarcinomas. ER expression in breast cancer and can serve as a good prognostic factor in invasive breast carcinomas and endometrial carcinomas and as an indicator of response to ... [\(more\)](#)

**Species:** Rabbit Monoclonal

**Cat#:** [Z2691](#)

**IHC:** Human breast carcinoma stained with ZR147. Note nuclear staining of tumor cells.



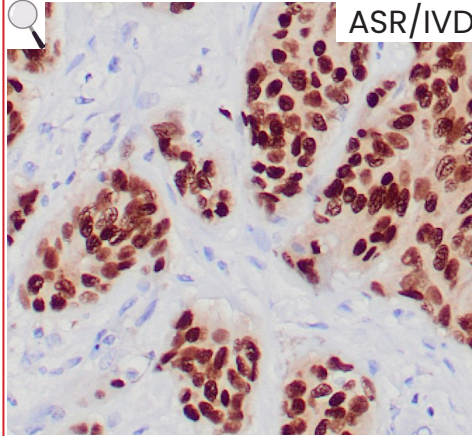
### PR (Progesterone Receptor; clone ZR290)

Recombinant. Recognizes PR (Progesterone Receptor). PR is predominantly expressed in female sex steroid-responsive tissues such as the mammary gland, uterus, and ovary but is also found in other tissues such as endocrine cells of the Langerhans' islets. The PR and estrogen receptor (ER) status have been used for over 20 years to predict breast carcinoma responsiveness to endocrine therapy and as a prognostic indicator for early recurrence. [\(more\)](#)

**Species:** Rabbit Monoclonal

**Cat#:** [Z2728](#)

**IHC:** Human breast carcinoma stained with ZR290. Note nuclear staining of tumor cells.



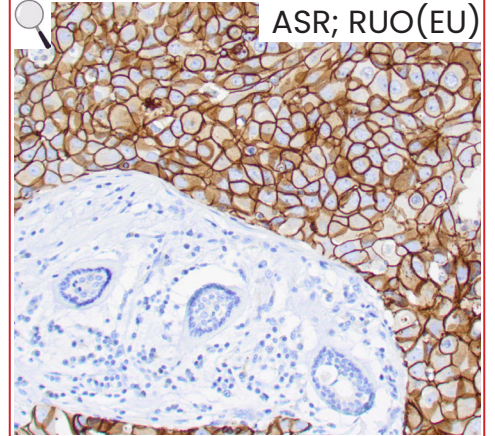
### Her-2/neu (clone ZR5)

Recombinant. Recognizes Her-2/Neu (Human EGF receptor 2), a transmembrane growth factor receptor that regulates cell growth and survival that is routinely assessed in all primary invasive breast cancer and metastatic/recurrent breast cancer to inform eligibility for anti-HER2 directed targeted therapy. HER-2/Neu is an oncogenic driver with negative prognostic impact in breast cancer. HER-2/Neu testing identifies tumors that may respond to anti-HER2 directed targeted therapy. [\(more\)](#)

**Species:** Rabbit Monoclonal

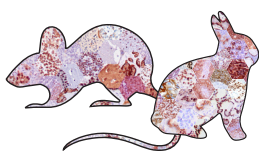
**Cat#:** [Z2025](#)

**IHC:** Breast infiltrating ductal carcinoma stained with ZR5. Note the strong membrane staining (3+) of carcinoma cells.



Antibody	Clone	Species	Cat. #
Cytokeratin 5/6	D5/16B4	Mouse	<a href="#">Z2133</a>
E-Cadherin	ZM63	Mouse	<a href="#">Z2373</a>
E-Cadherin	ZR375	Rabbit	<a href="#">Z2666</a>
Estrogen Receptor	ZM319	Mouse	<a href="#">Z2625</a>
Estrogen Receptor	ZR2	Rabbit	<a href="#">Z2021</a>
EGFR	ZR16	Rabbit	<a href="#">Z2743</a>
GATA-3	L50-823	Mouse	<a href="#">Z2227</a>
GATA-3	ZR358	Rabbit	<a href="#">Z2742</a>

Antibody	Clone	Species	Cat. #
Her-2 Neu	ZR218	Rabbit	<a href="#">Z2499</a>
Ki-67	ZM67	Mouse	<a href="#">Z2377</a>
Ki-67	ZR433	Rabbit	<a href="#">Z2789</a>
Ki-67	MIB-1	Mouse	<a href="#">Z2305</a>
PD-L1	ZR3	Rabbit	<a href="#">Z2002</a>
PR	ZR4	Rabbit	<a href="#">Z2023</a>
SOX-10	ZM10	Mouse	<a href="#">Z2293</a>
SOX-10	ZR275	Rabbit	<a href="#">Z2591</a>



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