

THE UNIVERSITY OF TEXAS

**MDAnderson  
Cancer Center**

Making Cancer History®

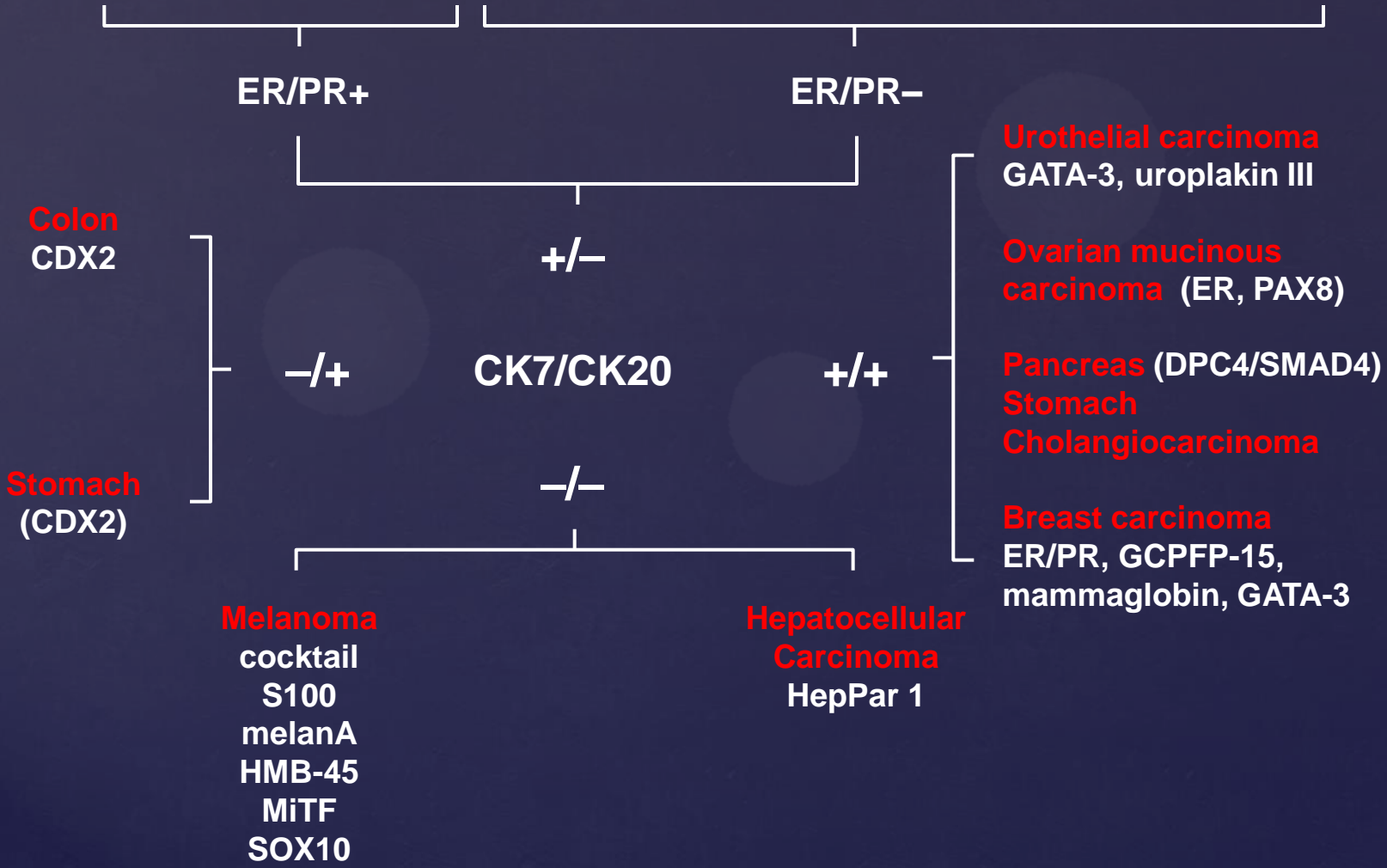


# Diagnostic Biomarkers in Metastatic Breast Cancer

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- **Metastatic breast cancer**
- **Unknown primary**
- **Metastatic tumors to breast:**
  - Melanoma
  - Carcinoma: ovary, lung, GI, kidney, skin (squamous)
  - (Lymphoma)

<b>Ovarian carcinoma</b> WT1 PAX8	<b>Breast carcinoma</b> GCDFP-15 mammaglobin GATA-3	<b>Lung adenocarcinoma</b> TTF-1 Naspin A	<b>Renal cell carcinoma</b> PAX8 PAX2	<b>Pancreas (DPC4/SMAD4)</b> <b>Stomach</b> <b>Cholangiocarcinoma</b>
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## **Sensitivity in breast cancer:**

**GCDFP-15: 60%**

**Mammaglobin: 80%**

**GATA-3: 70-80%**

## Gross cystic disease fluid protein-15 and mammaglobin A expression determined by immunohistochemistry is of limited utility in triple-negative breast cancer

### Primary TN (n=63)

Marker	Any positive staining	>5% positive staining
GCDFP-15	9 (14%)	4 (6%)
MAM	16 (25%)	7 (11%)
GCDFP-15/ MAM	19 (30%)	9 (14%)

### Metastatic TN (n=118)

Marker	Any positive staining	>5% positive staining
GCDFP-15 (n=110)	23 (21%)	13 (12%)
MAM (n=64)	25 (41%)	6 (9%)
GCDFP-15/ MAM (n=56)	24 (43%)	6 (11%)

- **62 primary TNBC (all resection specimens)**
- **68 metastatic TNBC  
(44 biopsies, 24 excision specimens)**

<b>Regional lymph nodes</b>	<b>19</b>
<b>Lung</b>	<b>25</b>
<b>Liver</b>	<b>9</b>
<b>Bone</b>	<b>4</b>
<b>Soft tissue</b>	<b>3</b>
<b>Ovary</b>	<b>2</b>
<b>GI tract</b>	<b>2</b>
<b>Distant LN</b>	<b>1</b>
<b>Bladder</b>	<b>1</b>
<b>Trachea</b>	<b>1</b>
<b>Uterus</b>	<b>1</b>

## **Antibodies**

- **GCDFP-15: clone D6, Covance**
- **Mammaglobin: clone 1A5, Biocare Medical**
- **GATA-3: clone HG3-31, Santa Cruz Biotechnology**

## **Positivity**

- **Positive: >5%**
- **Focal: 5% or less**
- **Negative: no staining**

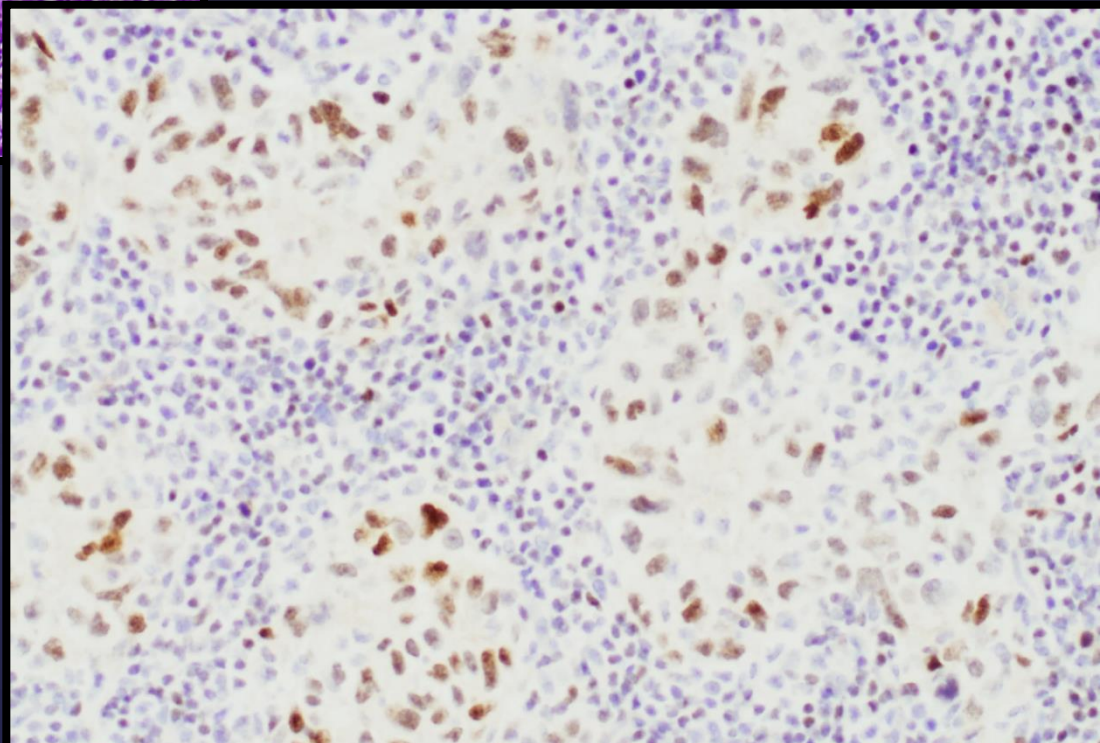
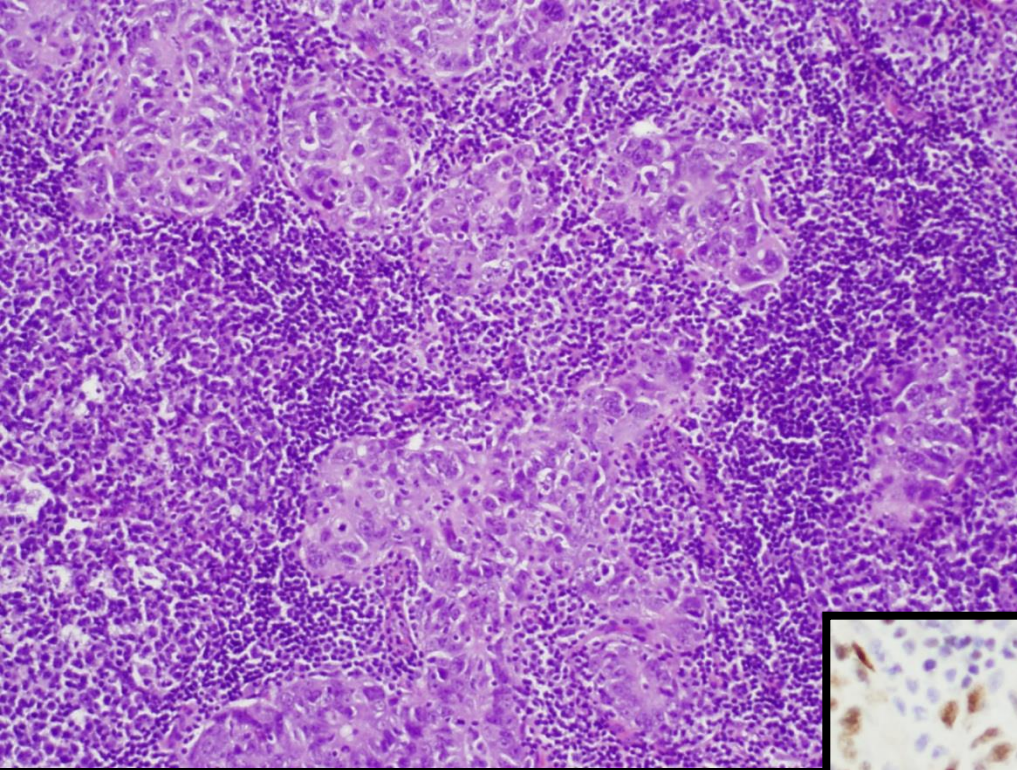
# Primary TN

Marker		Mammaglobin		
GATA-3	GCDFP-15	Positive	Focal	Negative
Positive (n=14)	Positive	1	0	2
	Focal	1	0	0
	Negative	0	2	8
Focal (n=11)	Positive	0	0	0
	Focal	1	0	0
	Negative	0	2	8
Negative (n=37)	Positive	1	0	0
	Focal	2	0	1
	Negative	1	5	27
<b>Total (n=62)</b>		<b>7</b>	<b>9</b>	<b>46</b>



## Primary TN (n=62)

Marker	Any positive staining	>5% positive staining
GATA-3	25 (40%)	14 (23%)
GCDFP-15	9 (15%)	4 (6%)
MAM	16 (26%)	7 (11%)
GATA-3/ GCDFP-15	29 (47%)	15 (24%)
GATA-3/ MAM	34 (55%)	19 (31%)
GCDFP-15/ MAM	19 (31%)	9 (15%)
Any marker	35 (56%)	19 (31%)
All markers	3 (5%)	1 (2%)

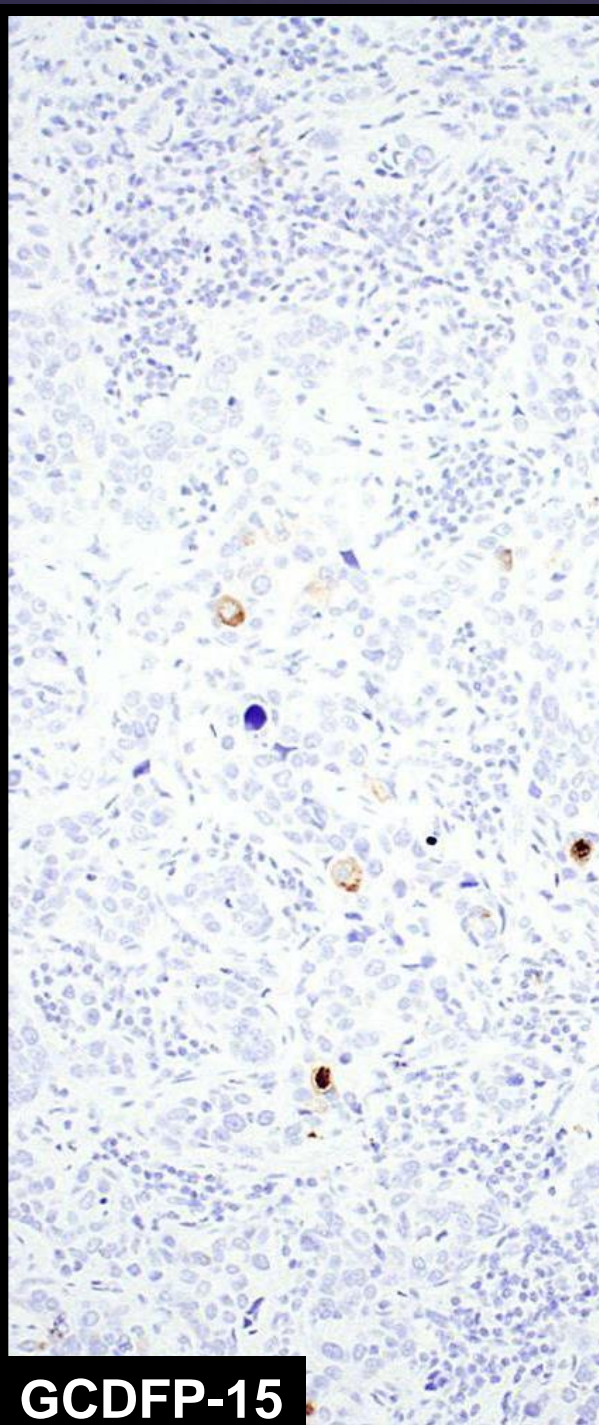


**GATA-3**

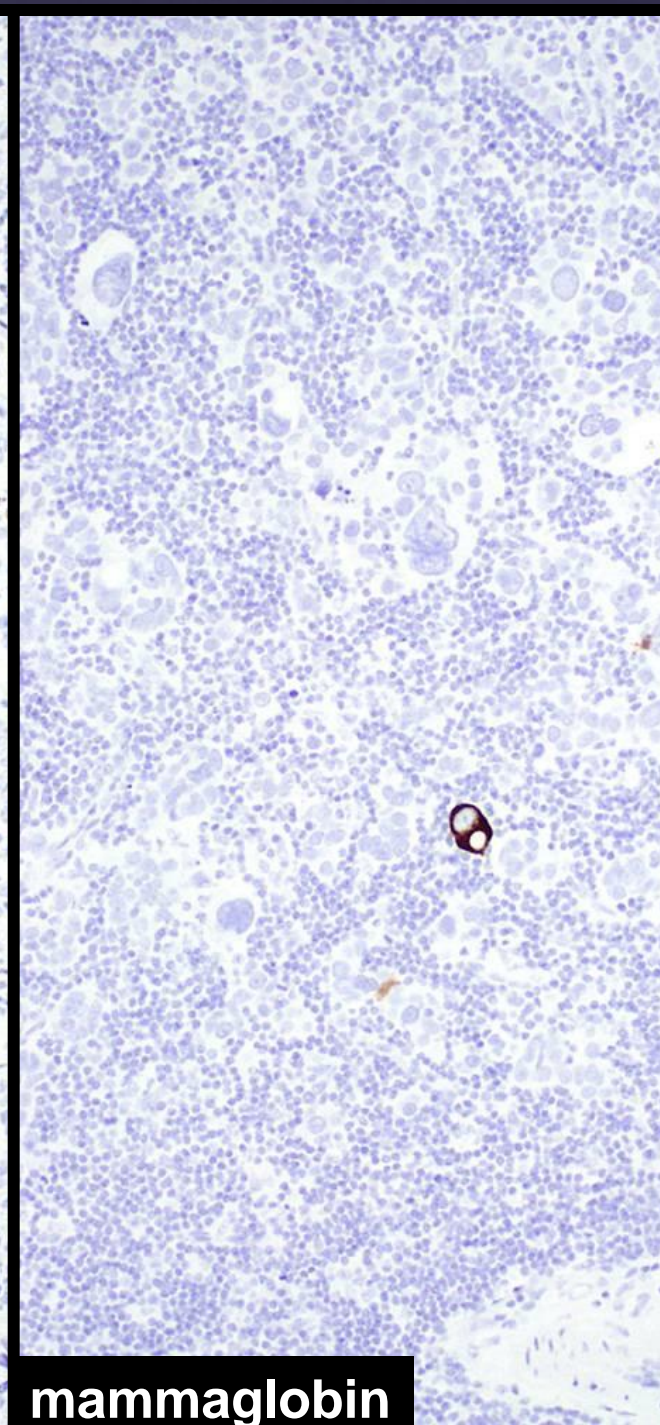
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## Metastatic TN (n=68)

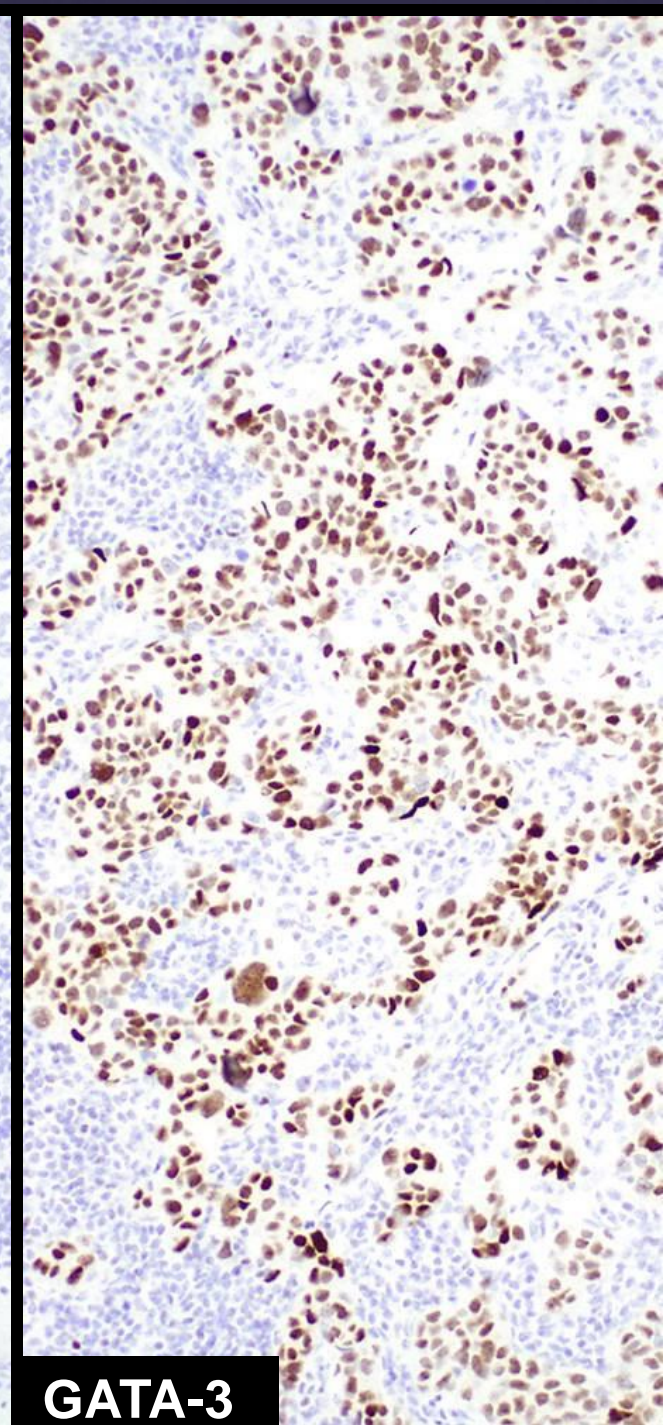
Marker	Any positive staining	>5% positive staining
GATA-3	30 (44%)	18 (26%)
GCDFP-15	11 (16%)	6 (9%)
MAM	22 (32%)	10 (15%)
GATA-3/ GCDFP-15	32 (47%)	23 (34%)
GATA-3/ MAM	41 (60%)	27 (40%)
GCDFP-15/ MAM	26 (38%)	14 (21%)
Any marker	42 (62%)	30 (44%)
All markers	6 (9%)	0 (0%)



**GCDFP-15**



**mammaglobin**



**GATA-3**

- **GATA-3 is a more sensitive marker than GCDFP-15 and mammaglobin in TNBC**
- **A panel of stains including all three markers may increase the diagnostic accuracy for tissue origin**
- **The sensitivity in TNBC is moderate even when all three markers are combined, therefore negative staining for all markers does not exclude breast origin**

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