AURORA DIAGNOSTICS

EDUCATIONAL SERIES

2013

ILLUMINATING THE PATH TO BETTER HEALTH

Seacoast Pathology

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- Exeter, New Hampshire
- Seacoast Pathology was founded Sept 17, 1981 with a Cytology lab. The Molecular lab was added in Feb of 2003 and the Histology lab came shortly after in Sept of 2005.
- They have predominately Dermatology and GYN clients. On top of that they service 3 area hospitals and are a reference lab for IHC's
- The perform routine stains, special stains and IHC stains.
- The Histology lab runs 3 shifts beginning at 10:00 pm on Sunday until 12:30 am on Saturday.
- They have 2 Dermatopathologists, 5 full time surgical pathologists and 1 part-time surgical pathologist.
- The Histology lab has 1 aid, 1 full time grossing tech, and 7 histotechs. Out of the 7 histotechs 4 are HT certified and 2 are training to become certified.

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AURORA DIAGNOSTICS

Breast Cancer

February 12, 2013

Presented By

Jacqueline Brooks, MB, SCT, HTL (ASCP)

Dedicated to Martha Cook

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And my Sisters

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The year before we lost our Mother to Breast Cancer

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Before being diagnosed

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Mother and Daddy

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I am the baby

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My Family History

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- Maternal Grandmother, mid 30's, smoker (7 children)
- Mother, age 60, smoker
- Aunt Bi, late 30's, smoker
- Aunt F, early 60's, smoker
- Aunt M, brain, late 60's, smoker
- Aunt G, lung, late 60's, smoker
- Aunt Be, brain, late 50's, smoker
- One son – still living in his late 80s
- Maternal grandfather, lung, early 70's, smoker

My Family History

- Cousin, age 6, Leukemia
- Cousin, age 30, stomach

No other reported cases of:

My Mother had six girls, so far non have been diagnosed with breast cancer.

My Family History

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- All Six girls are BRCA mutation negative
- BRCA 1 and BRCA 2 are human genes that belong to a class of genes know as tumor suppressors. Mutation of these genes has been linked to hereditary breast and ovarian cancer.

Breast Cancer Susceptibility gene 1 and 2

Risk Factors

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- Age and gender
- Family history of breast cancer
- Genes (BRCA1 and BRCA2)
- Menstrual cycle
- Alcohol use
- Childbirth
- DES
- Hormone replacement therapy
- Obesity
- Radiation

Symptoms

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- Early – no symptoms
- As the cancer grows:
  - Lump
  - Nipple changes
  - Nipple discharge
- Advanced
  - Bone pain
  - Breast pain or discomfort
  - Skin ulcers
  - Swelling of one arm (next to the breast with cancer)
  - Weight loss

Key Statistics 2012

- Most common cancer among women, except skin cancers
- About 1 in 8 (12%) women will develop invasive breast cancer
- 226,870 new cases of invasive breast cancer
- 63,300 new cases of in situ (CIS)
- 39,510 women will die from breast cancer

Key Statistics

- Incidence rates began decreasing in 2000
- Hormone Therapy
- Incidence rates have been stable since 2004
- Second leading cause of cancer death among women
- Death rates declining since 1990
- Early detection key factor

Types of Breast Cancer

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- Ductal
- Lobular
- Sarcomas (Phyllodes tumor and Angiosarcoma)

Ductal Carcinoma

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- Most common type
- Forms in the lining of a mild duct
- The ducts carry breast mild from the lobules, where it's made, to the nipple
- Additional types of invasive ductal carcinoma:
  1. Medullary Ductal Carcinoma
  2. Mucinous Ductal Carcinoma
  3. Papillary Ductal Carcinoma
  4. Tubular Ductal Carcinoma

H&E Ductal Carcinoma

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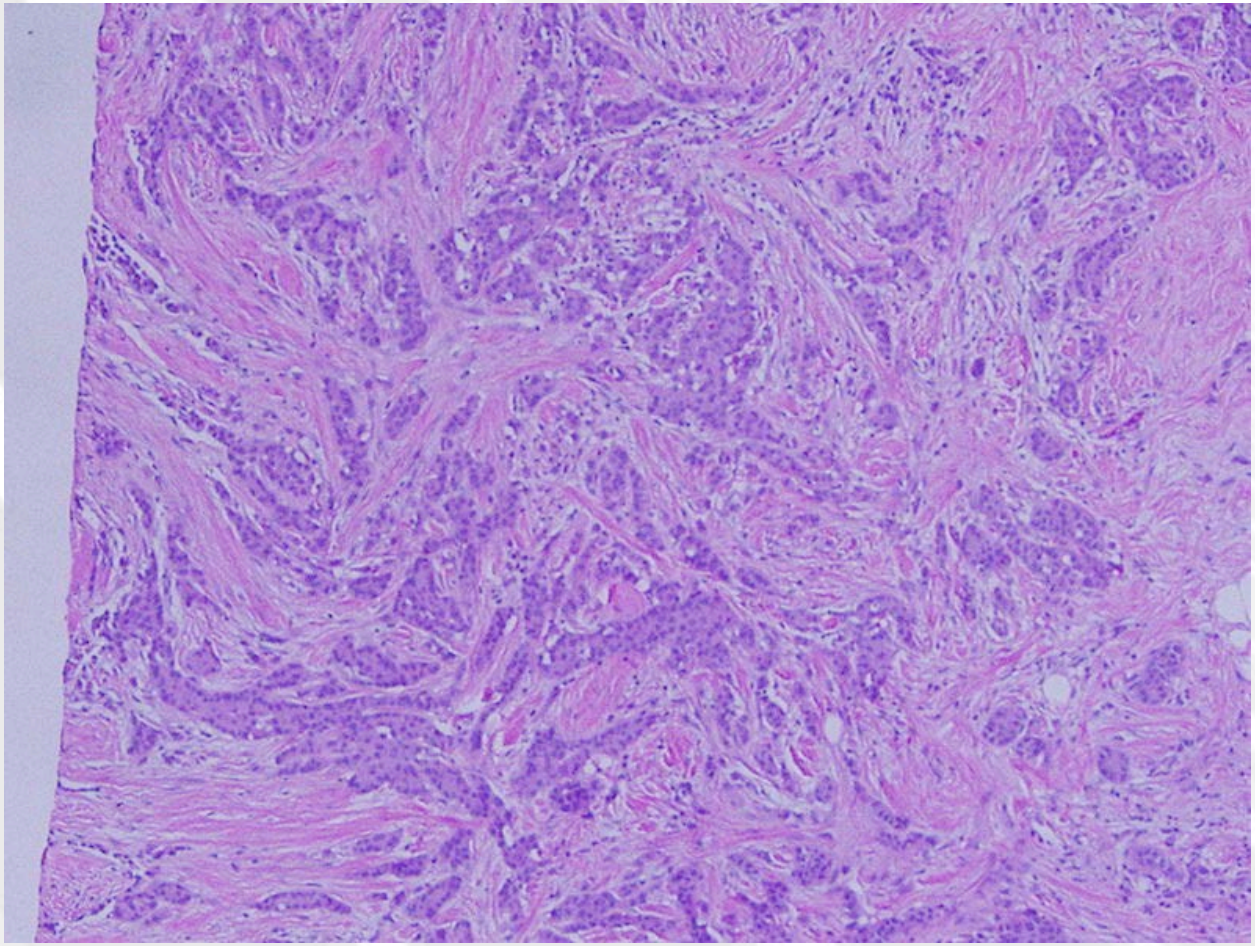
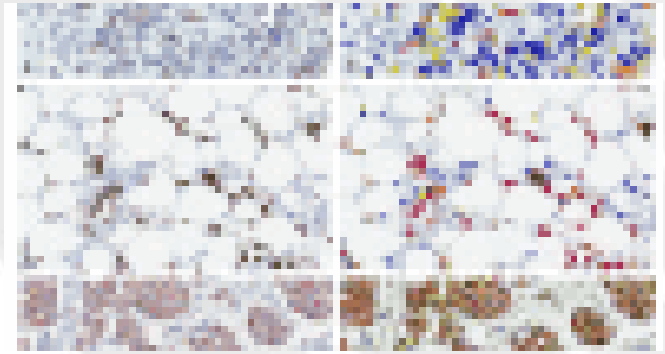
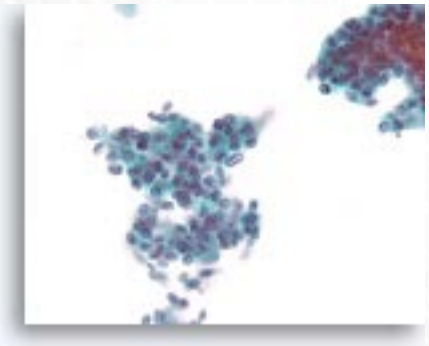


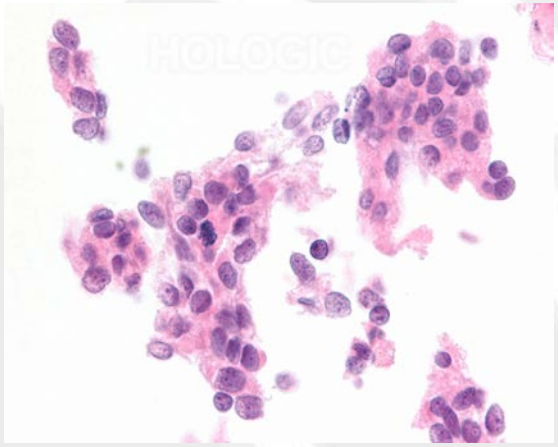
Ductal Carcinoma



IHC



Cytology
Smear



Cytology Cell Block

Lobular Carcinoma

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- Starts in the lobules of the breast, where breast milk is produced
- The lobules are connected to the ducts, which carry milk to the nipple

Anatomy of the Breast

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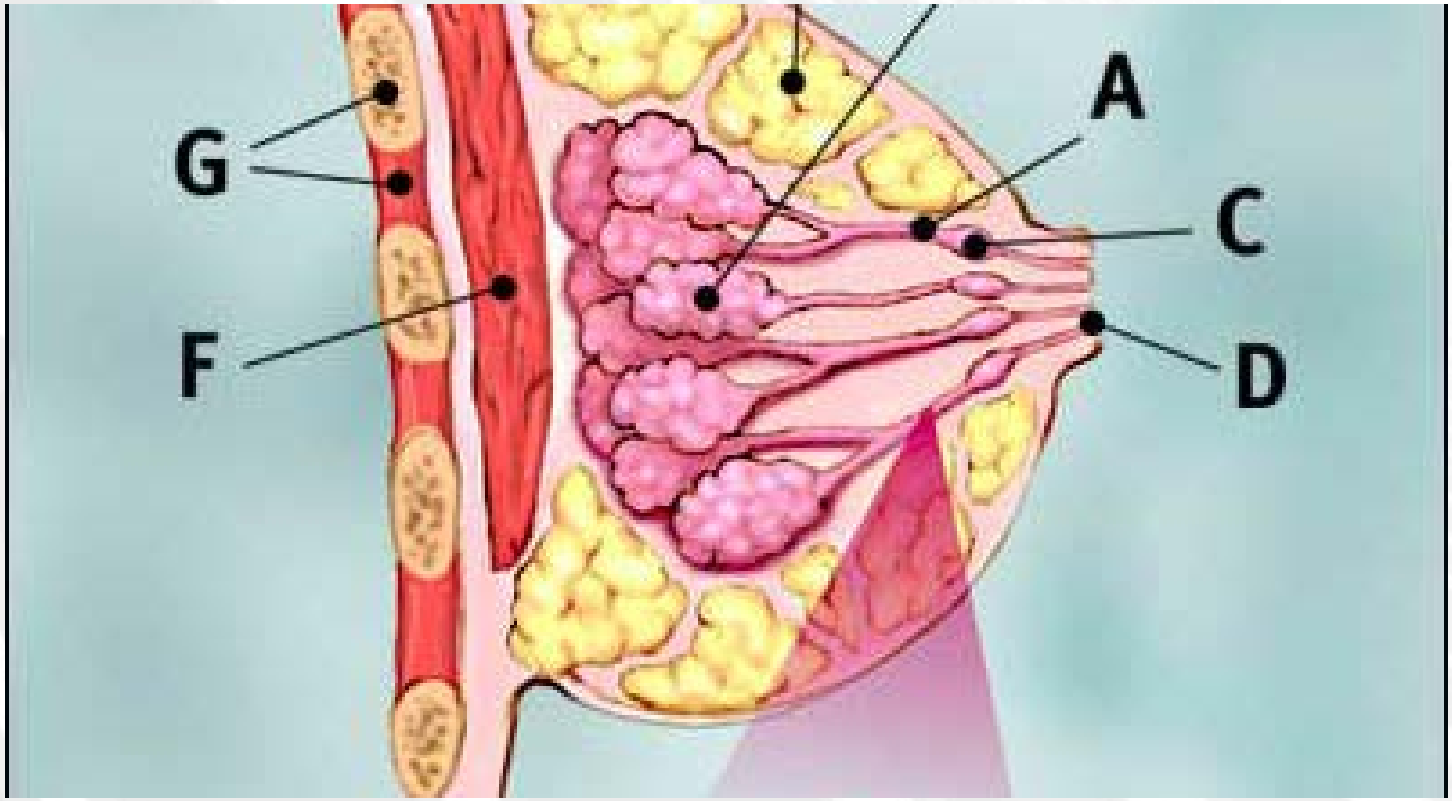


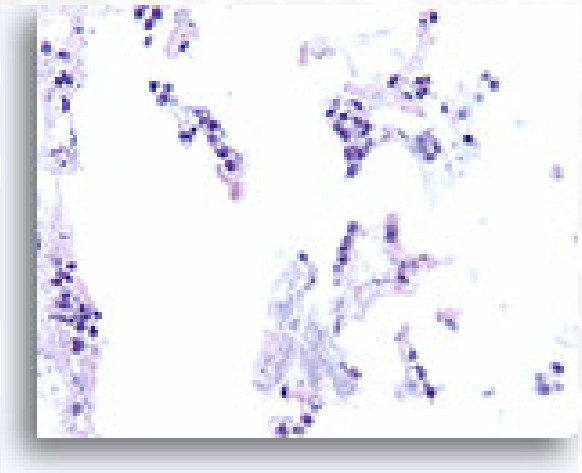
A. ducts, B. lobules, C. dilated section of duct to hold milk, D. nipple, E. Fat, F. pectoralis major muscle, G. chest wall/rib cage

Lobular Carcinoma

HER2+ classical invasive lobular carcinoma. The tumor demonstrates a characteristic discohesive growth pattern (A, H&E, ×100), absent membranous E-cadherin stain and positive cytoplasmic p-120 stain (B, E-cadherin, brown; p-120, red, ×100; note internal positive control of membranous E-cadherin and p-120 stains in adjacent ducts), and diffuse, strong, complete membranous HER2 immunohistochemical stain (C, ×100).

Lobular Carcinoma

Cytology Smear



Cytology Cell block

Connective tissue Breast Carcinomas

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- Sarcomas
  1. Phyllodes tumor
  2. Angiosarcoma

Phyllodes tumor

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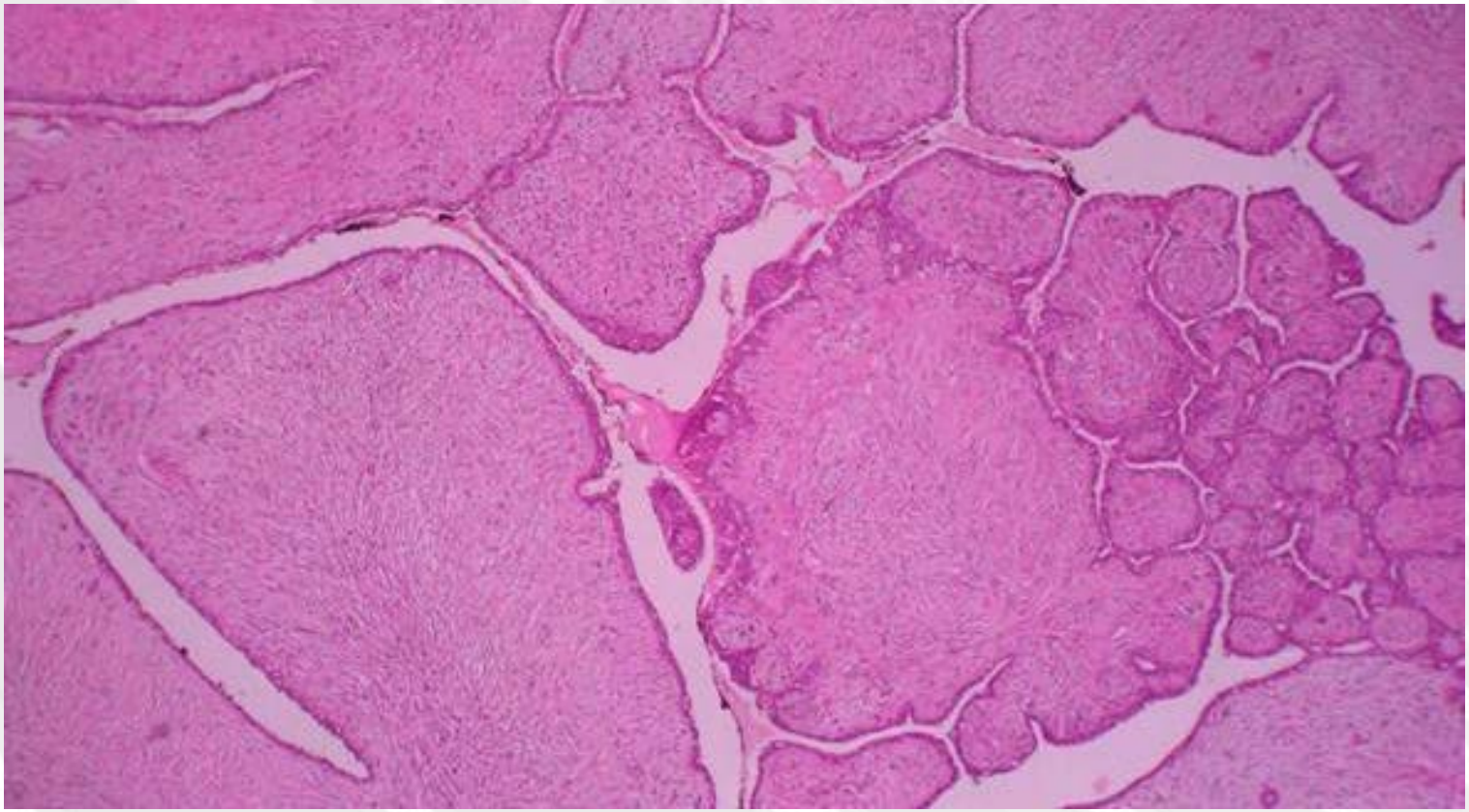
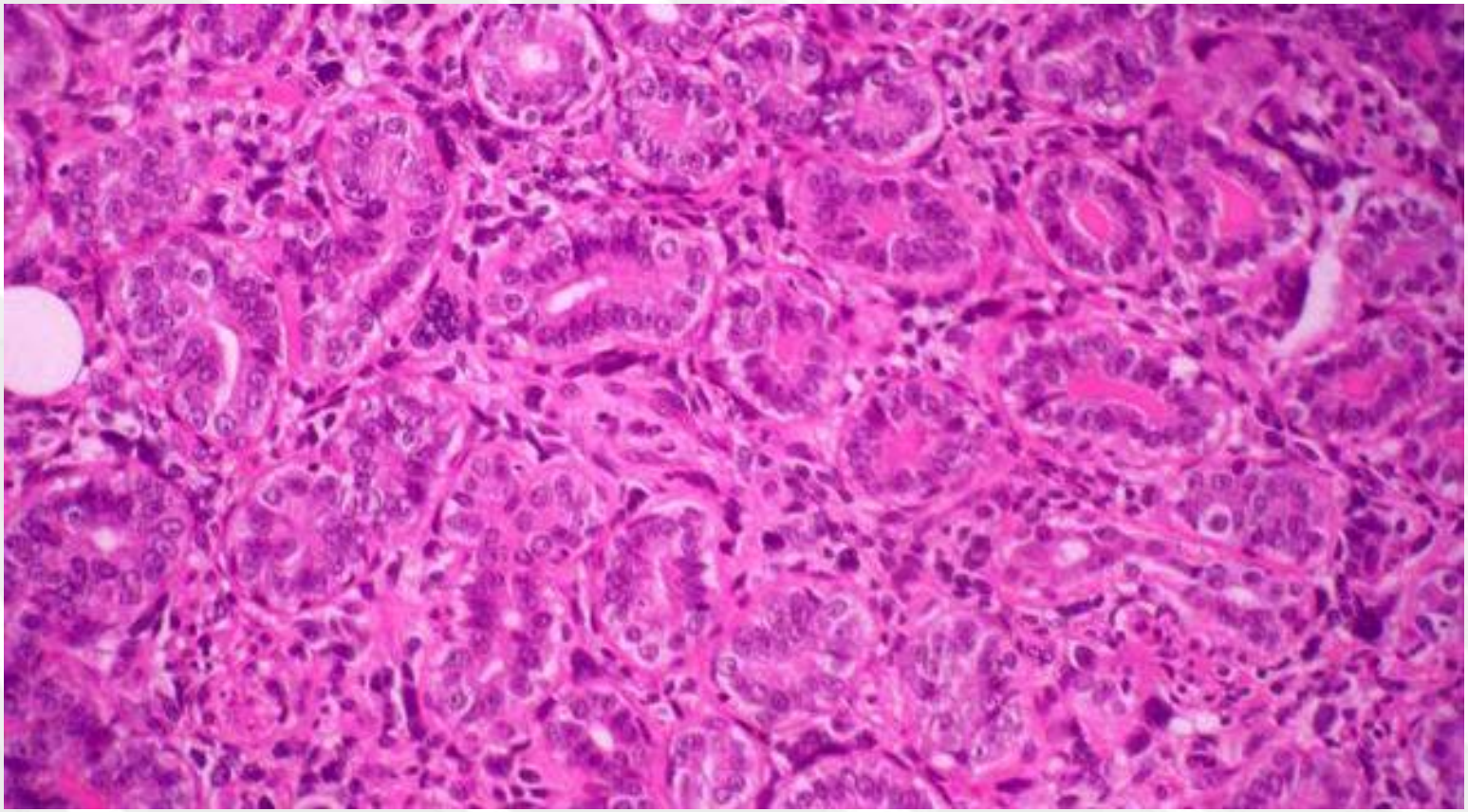


Phyllodes Tumor

AURORA DIAGNOSTICS



Phyllodes Tumor

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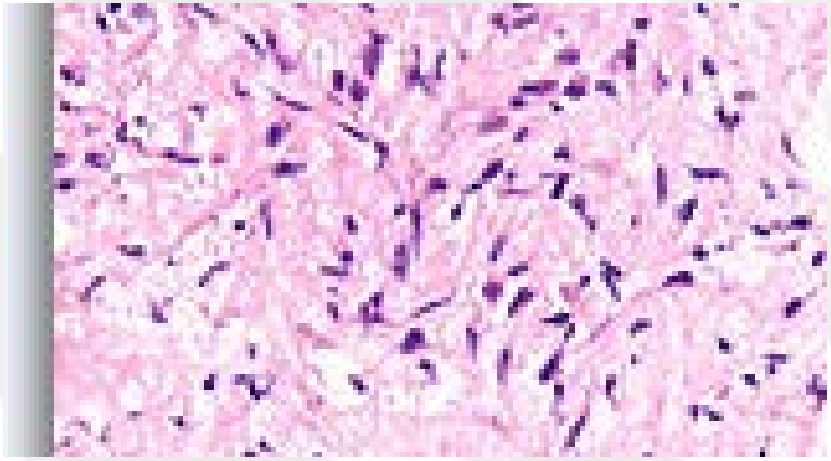
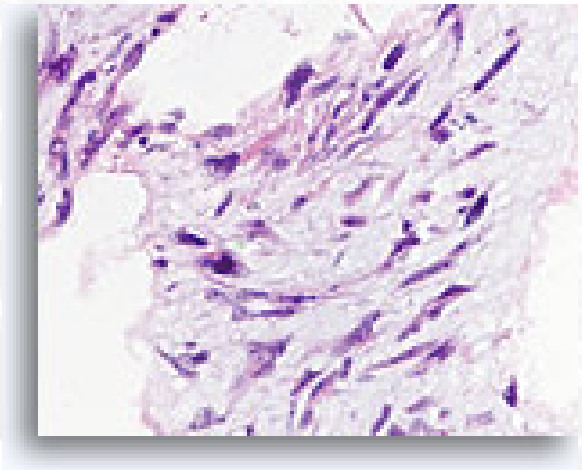


Phyllodes tumor
smear



Phyllodes tumor
Cell block

Angiosarcoma Breast

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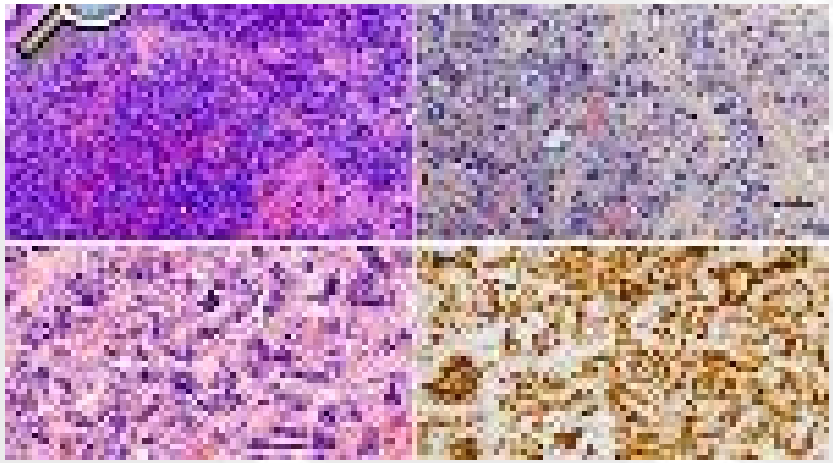
Angiosarcoma: A form of tissue cancer (sarcoma) that arises in the lining of blood vessels. Angiosarcomas tend to be aggressive, recur locally, and spread widely. Predisposing factors include lymphedema (as from a radical mastectomy), radiotherapy, foreign materials (such as steel and plastic) in the body, and environmental agents (such as arsenic solutions used to spray grapevines and vinyl chloride in the plastic industry).



Angioscarcoma Cytology

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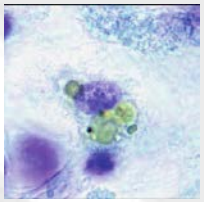

not in case 1 (Fig. 3A inset).

The tumor cells of both cases are strongly reactive for CD31 and CD34 and negative for cytokeratin (Fig. 4A, B inset).

Diagnosing Breast Cancer

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- Breast Exam
- Mammogram
- Breast ultrasound
- Removing a sample of breast cells for testing (biopsy)
- Breast magnetic resonance imaging (MRI)

Breast Biopsy

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- H&E
- IHC
  1. ER
  2. PR
  3. KI 67
  4. HER 2 neu

ER (Estrogen Receptor)

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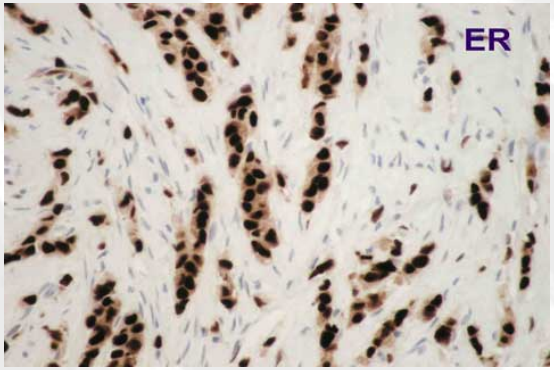
- 75% of all breast cancers are “ER” positive
- They grow in response to the hormone estrogen
- 60% likely to respond to endocrine therapy
- Tamoxifen – blocks the effects of estrogen



PR (Progestrogen Receptor)

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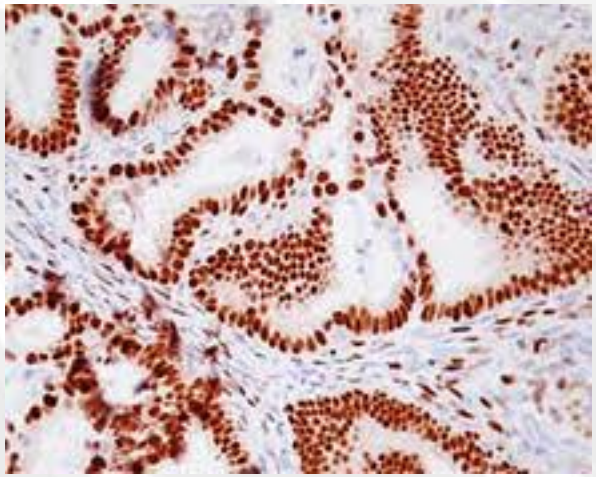
- 65% of all breast cancers are PR positive
- They grow in response to the hormone progesterone
- 60% likely to respond to endocrine therapy



KI 67

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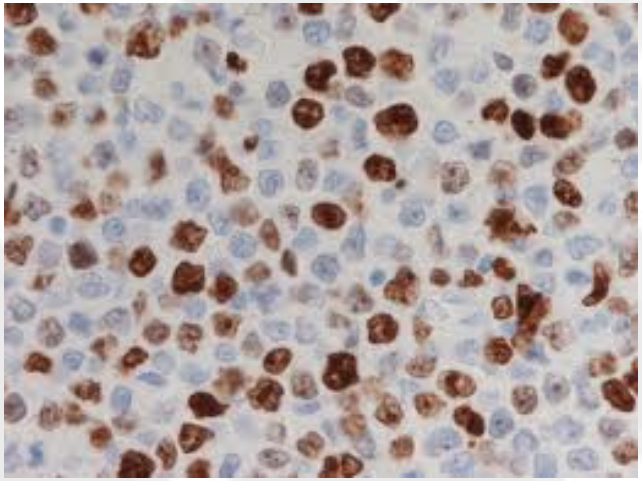
- Nuclear protein
- Necessary for cellular proliferation
- An excellent marker to determine the growth fraction of a given cell population



HER2

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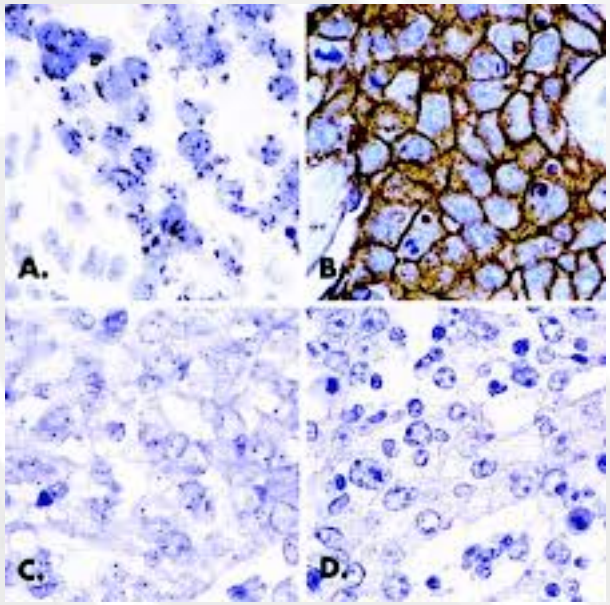
- 20% to 25% of breast cancers make too much of a protein known as HER2/neu
- Breast cancers tend to be much more aggressive and fast-growing
- Herceptin has shown to dramatically reduce the risk of recurrence
- Tykerb is given for metastatic cancer if Herceptin fails

HER2

- Herceptin – possible risk of Heart damage
- Herceptin – possible risk of lung damage
- Perjeta – late-stage HER 2 positive

HER 2 CISH



HER2 FISH

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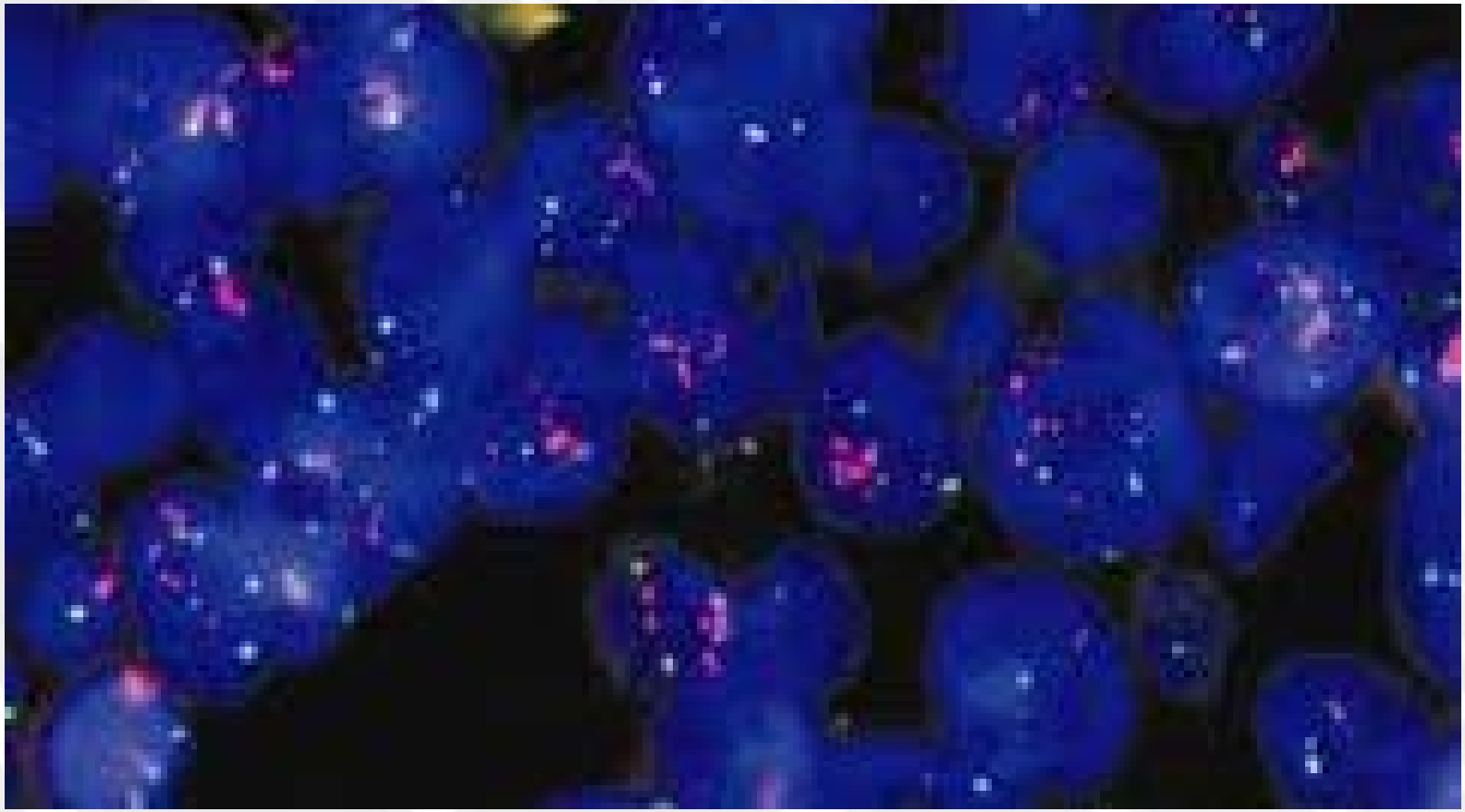

The End
National Lab Week
April 22-26, 2013