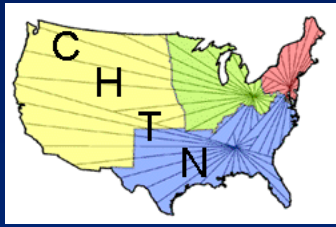# Histologic quality control assessment of tissue samples procured for research purposes

Procedures used by

The Cooperative Human Tissue Network

Prepared: December 2006
Updated: November 2014

Background

◆ The majority of CHTN tissue collection is performed in the context of excess or "leftover" tissue present in specimens resected from patients as part of their routine clinical care

◆ Fresh and frozen tissue samples have matched tissue samples fixed in formalin and embedded in paraffin for histologic sectioning
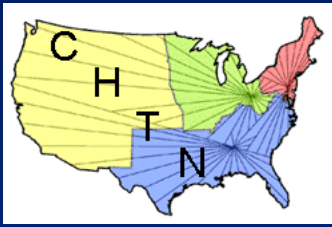
Selection of tissue for histologic quality control

ORIGINAL TISSUE SPECIMEN

A | A B | B

ALIQUOT "A"

QUALITY CONTROL FOR "A" AND "B"

ALIQUOT "B"
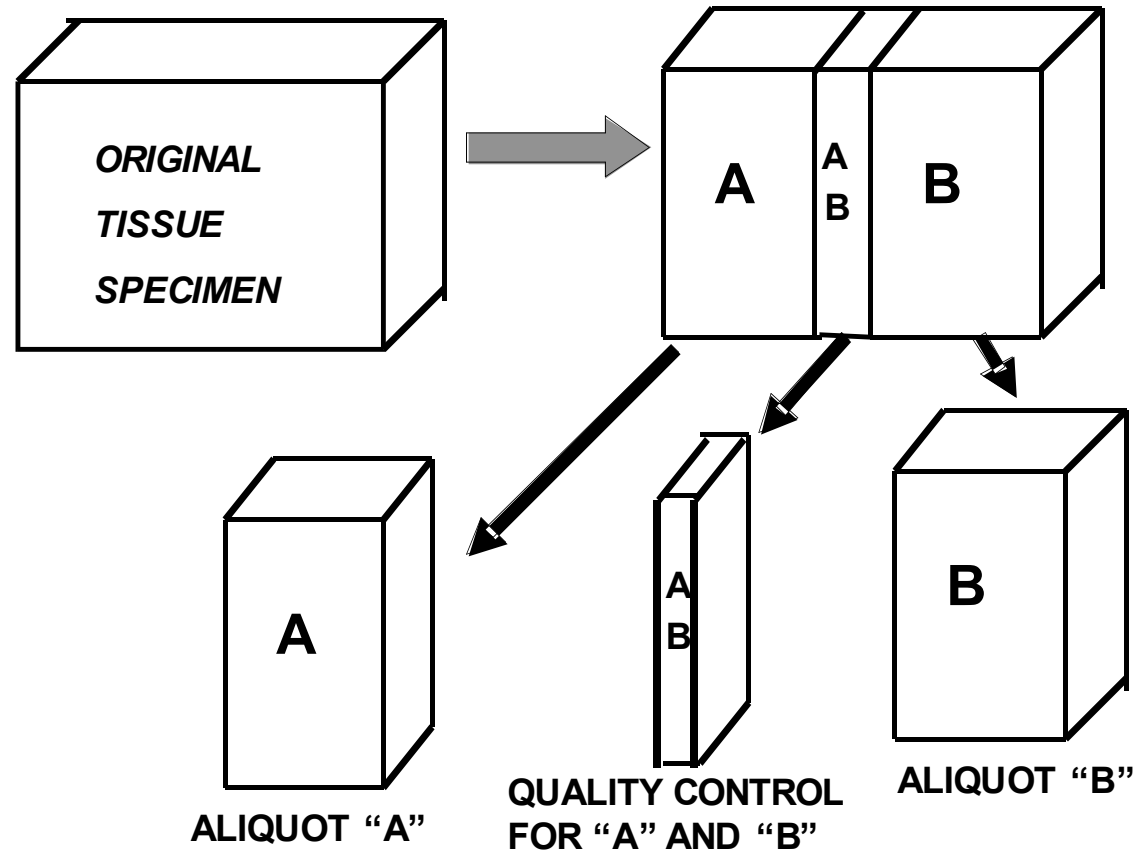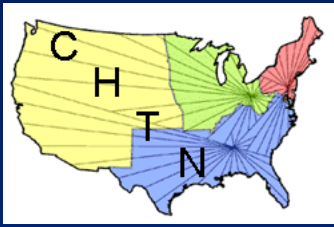
Background (cont.)

◆ Tissue samples are provided to investigators with pertinent clinicopathologic data obtained from the surgical pathology report and other clinical records

◆ The histologic slides from the FFPE tissue are examined for tissue content and agreement with associated clinicopathologic data by an Anatomic Pathologist
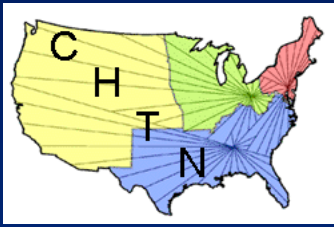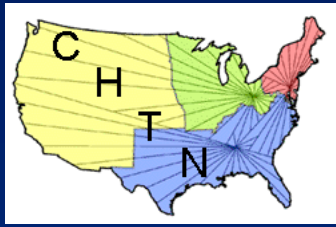
Quality control data collected

- Anatomic site of procured tissue
- Tissue classification:
  - Malignant neoplasm
  - Neoplasm indeterminate for malignancy
  - Benign neoplasm or mass
  - Diseased (not neoplastic)
 - Normal
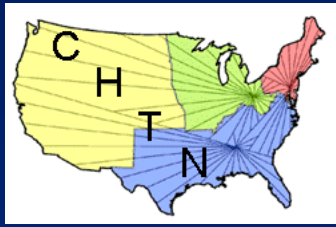
Quality control data collected (cont.)

◆ If malignant neoplasm:
- Primary
- Recurrent
- Metastatic
- Uncertain if primary or metastatic

◆ If metastatic, site of primary tumor

◆ Additional diagnostic classification (e.g. specific disease classification from clinical pathology report)

◆ If QC material is consistent with annotated clinicopathologic data
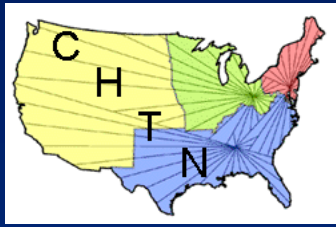
Quality control data collected (cont.)

◆ If a neoplasm (tumor) is present in the tissue section, an assessment is made of what percentage of the entire tissue area is involved by the tumor.

◆ Separate assessments are then made <u>just on the area involved by tumor</u>

- Please note that a tumor has a mixture of neoplastic cells, non-neoplastic tumor stromal cells and residual normal tissue cells that have been infiltrated by the tumor.

- The term "tumor cellularity" refers to the percentage of neoplastic cell nuclei as a total of all cell nuclei in the tumor area
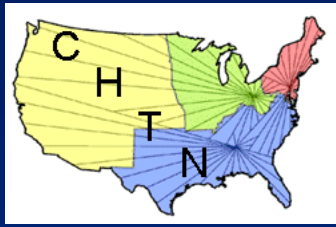
Quality control data collected (cont.)

◆ Tumor attributes that are assessed:

- % of nuclei that are neoplastic cells (tumor cellularity)

- % tumor necrosis, by cellularity
  - (using only tumor cells as denominator)

- % non-neoplastic stroma, by area
  - (using only tumor area as denominator)

- % acellular mucin, by area
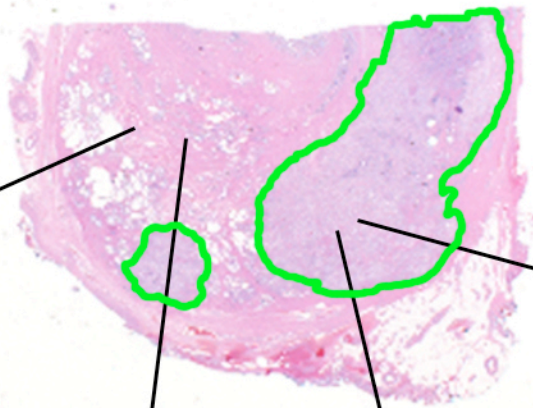 - (using only tumor area as denominator)

Examples of histologic QC

◆ Adenocarcinoma of the Prostate

◆ Adenocarcinoma of the Colon

◆ Lobular Breast Carcinoma

◆ Adenocarcinoma of the Pancreas

◆ Mucinous adenocarcinoma of the Colon

Prostate Cancer
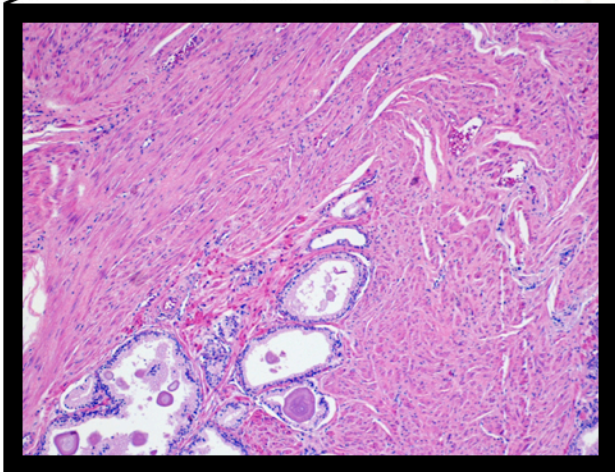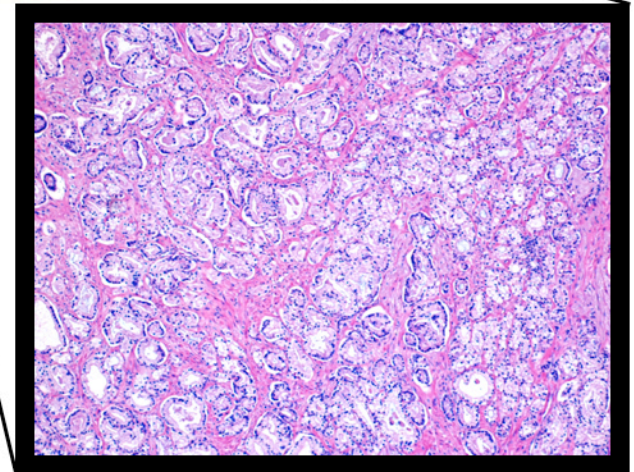

1X, tumor areas circled

Assessments using all tissue in section:

% tumor by area.............30%

Non-neoplastic

Tumor

Assessments using only areas involved by tumor:
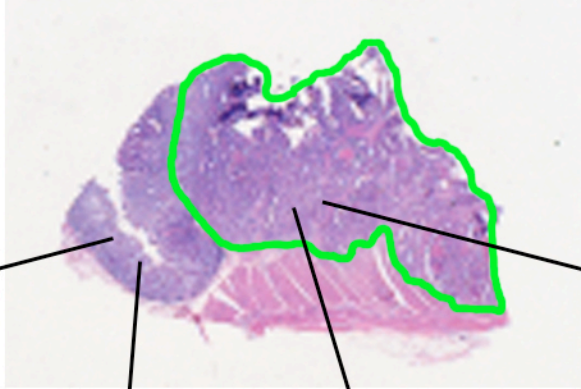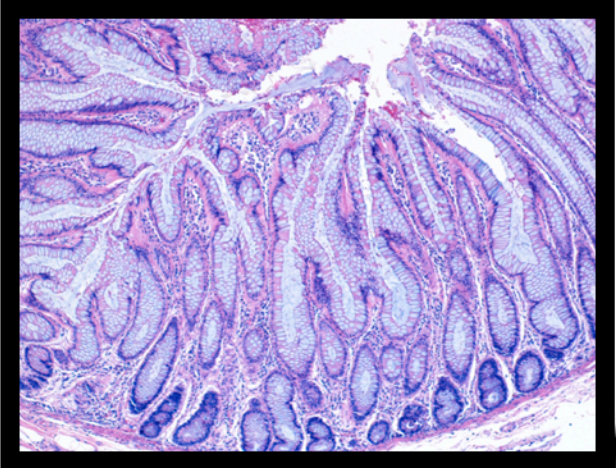
% tumor nuclei (cellularity)...........85%
% tumor necrosis by cellularity.......0%
% stroma by area.........................15%
% acellular mucin by area..............0%

Colon Cancer
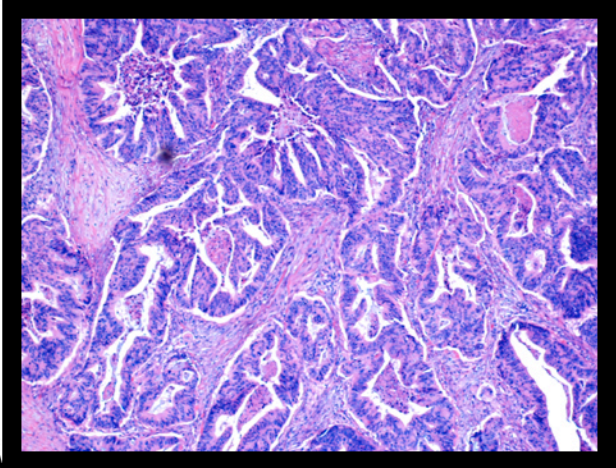

1X, tumor areas circled

Assessments using all tissue in section:
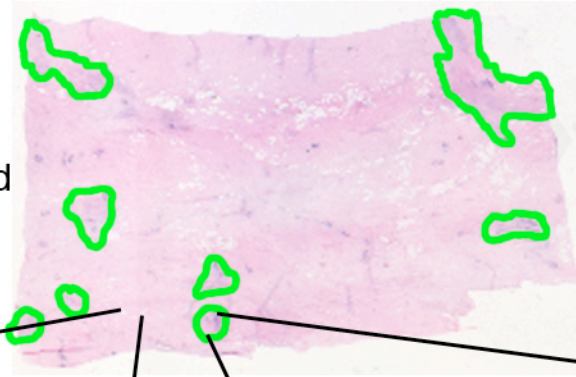% tumor by area.............60%

Non-neoplastic

Tumor

Assessments using only areas involved by tumor:
% tumor nuclei (cellularity).........70%
% tumor necrosis by cellularity....5%
% stroma by area.......................25%
% acellular mucin by area...........5%
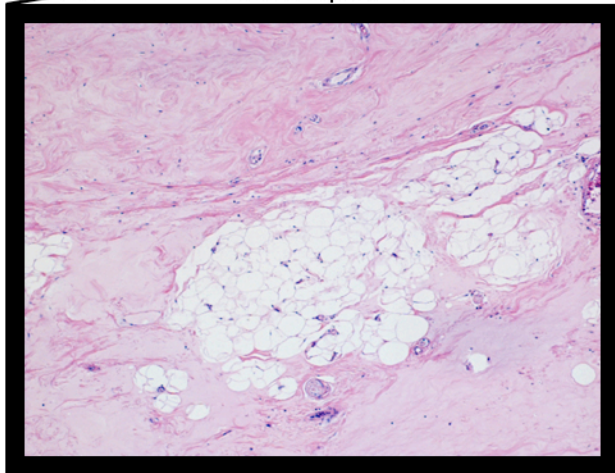
Lobular Breast Cancer
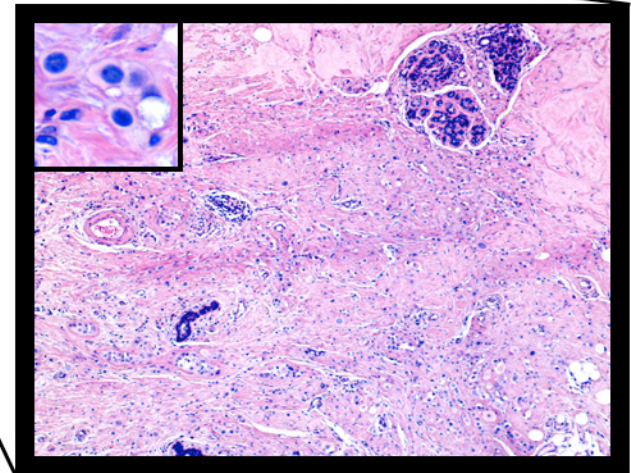

1X, tumor areas circled

Assessments using all tissue in section:

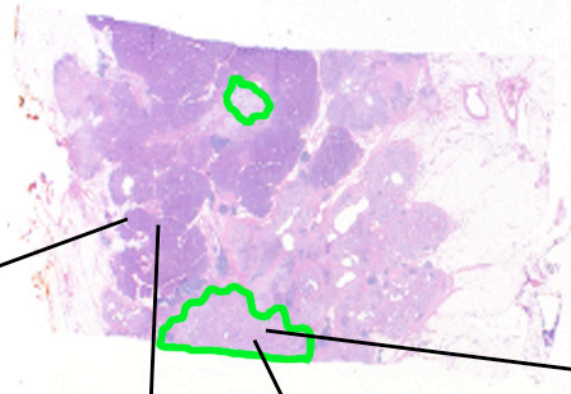% tumor by area.............10%

Non-neoplastic

Tumor

Assessments using only areas involved by tumor:

% tumor nuclei (cellularity)...........65%
% tumor necrosis by cellularity.......0%
% stroma by area..........................90%
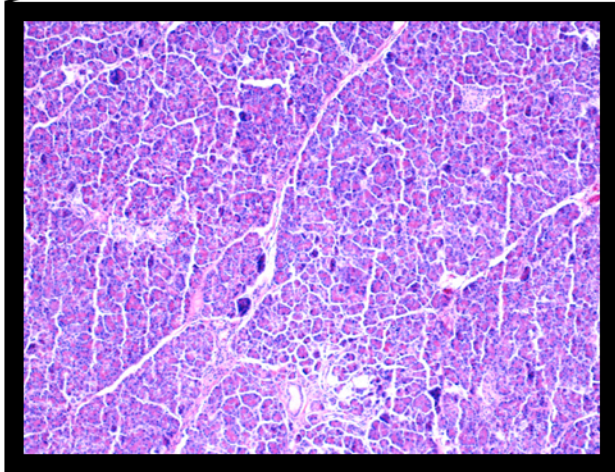% acellular mucin by area..............0%

Pancreatic Cancer

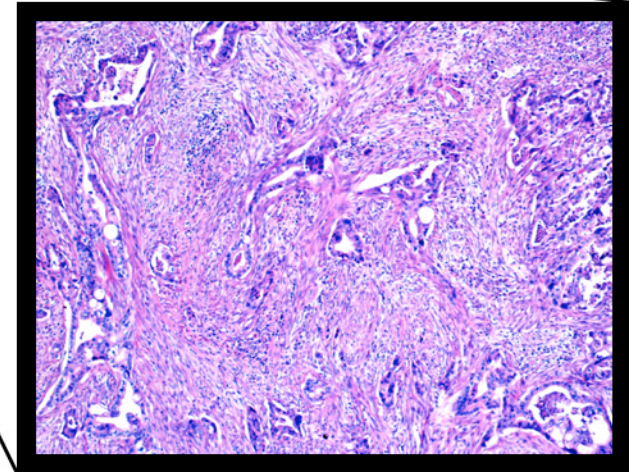

1X, tumor areas circled

Assessments using all tissue in section:

% tumor by area.............5%

Non-neoplastic

Tumor

Assessments using only areas involved by tumor:

% tumor nuclei (cellularity)...........10%
% tumor necrosis by cellularity.......0%
% stroma by area.........................90%
% acellular mucin by area.............<5%

Mucinous Colon Cancer

1X, tumor areas circled

Assessments using all tissue in section:
% tumor by area.............85%

Non-neoplastic

Tumor

Assessments using only areas involved by tumor:
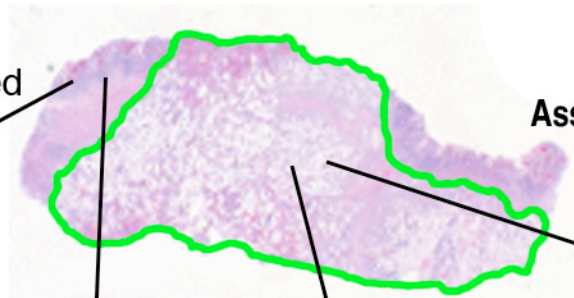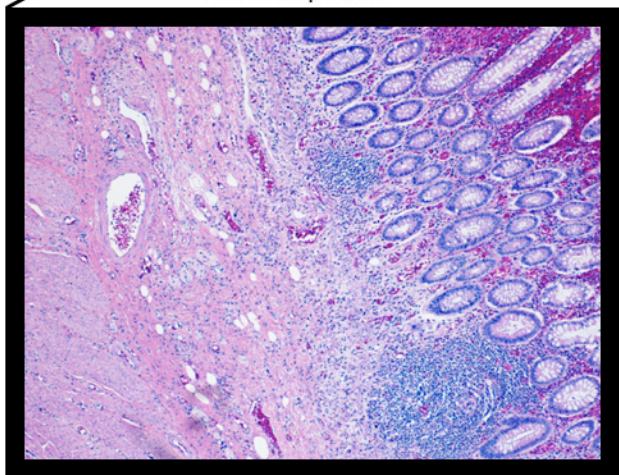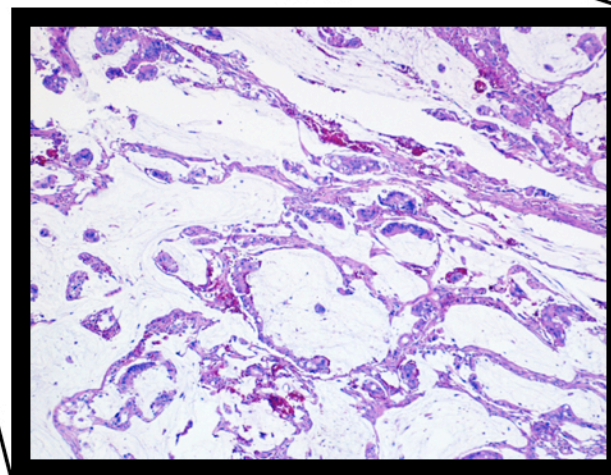% tumor nuclei (celularity)...........90%
% tumor necrosis by cellularity.. ..0%
% stroma by area.......................10%
% acellular mucin by area...........80%