BASEL

old university

TONEGAWA Susumu

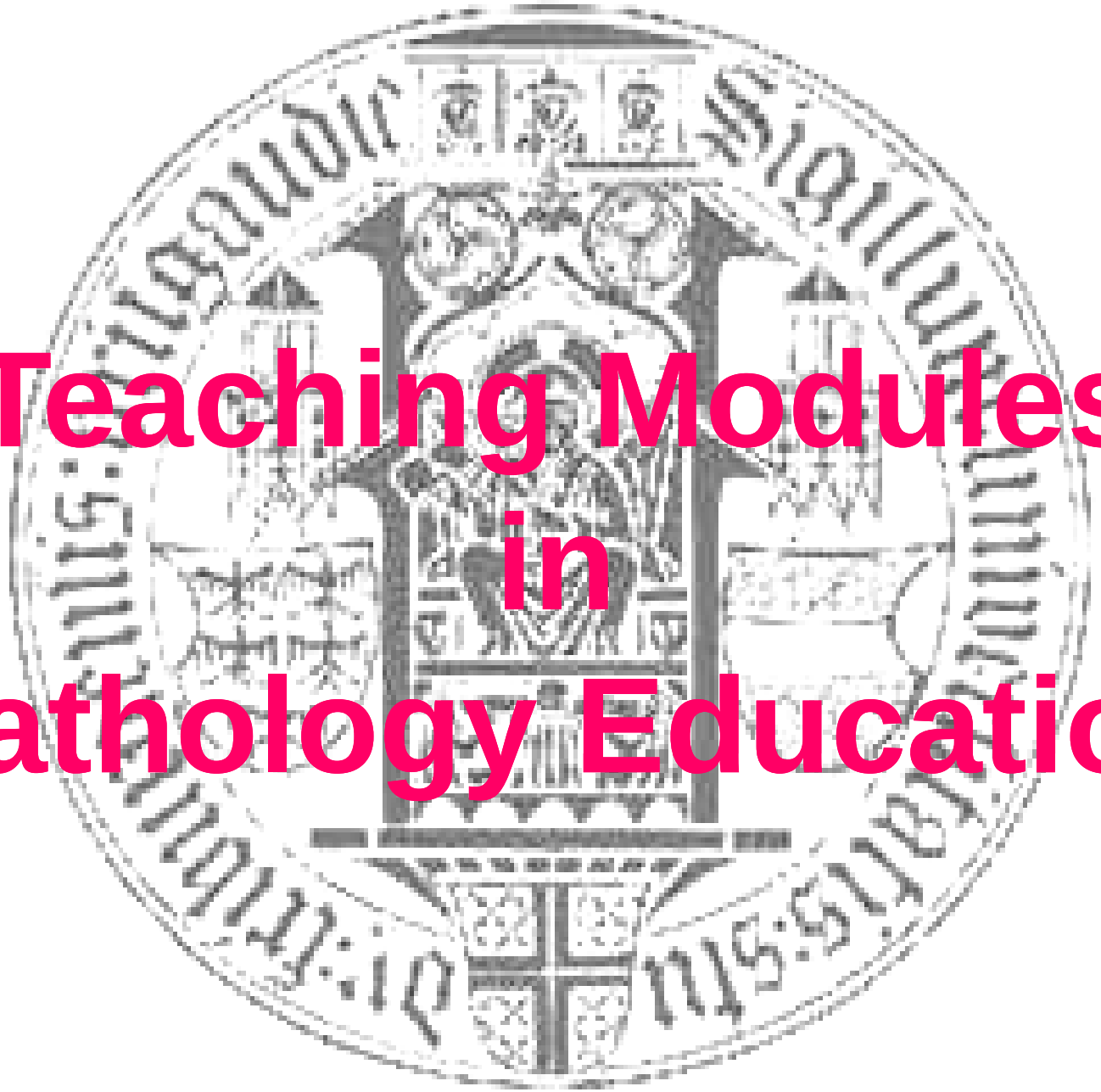
1987
Nobel prize
antibody diversity

TAWARA, Sunao
1906
cardiac conducting system


LEISSIGEN / Interlaken
Switzerland

EIGER north face - „top of Europe“

IMAI Michiko et al.
23.7.1969
Japanese direttissima route

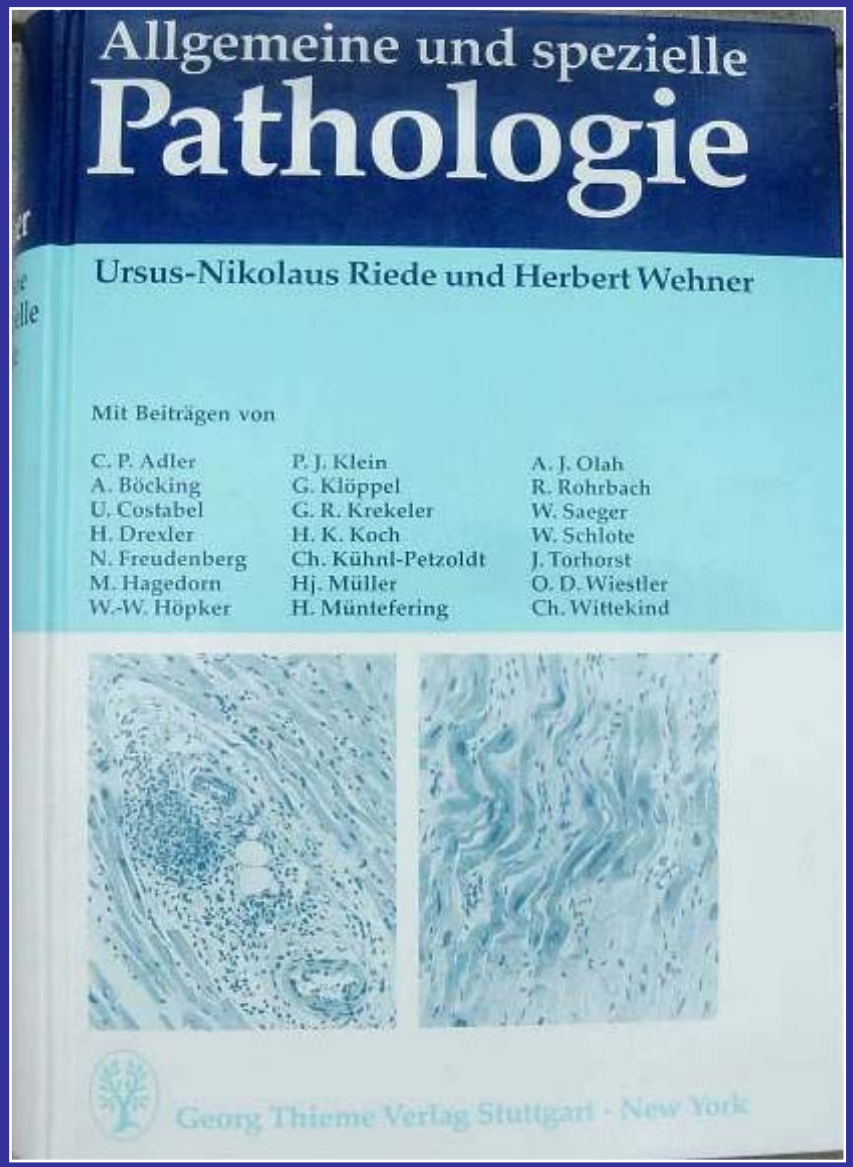


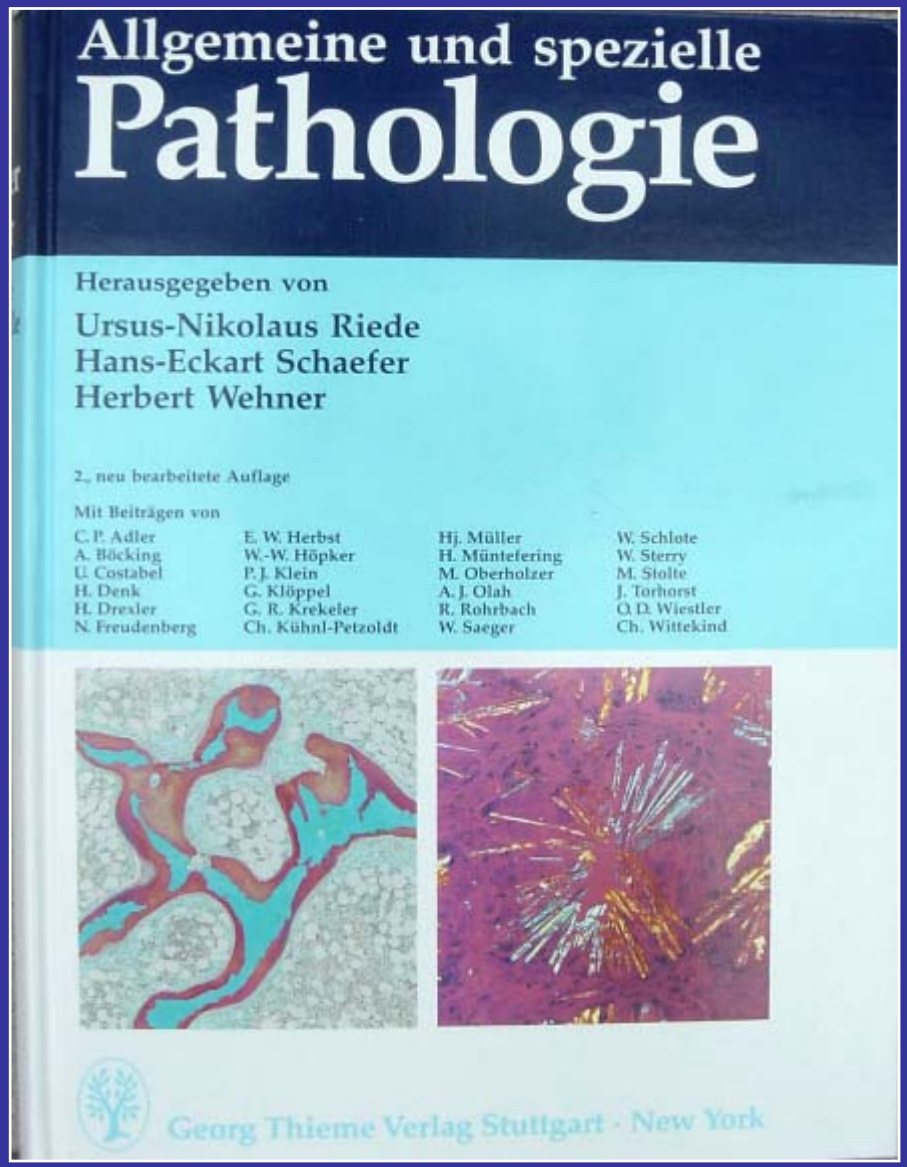
Teaching Modules in Pathology Education

Prof. Dr. Urs-N. Riede, Department of Pathology, University of Freiburg

Textbook: **Georg Thieme, Stuttgart – New York**

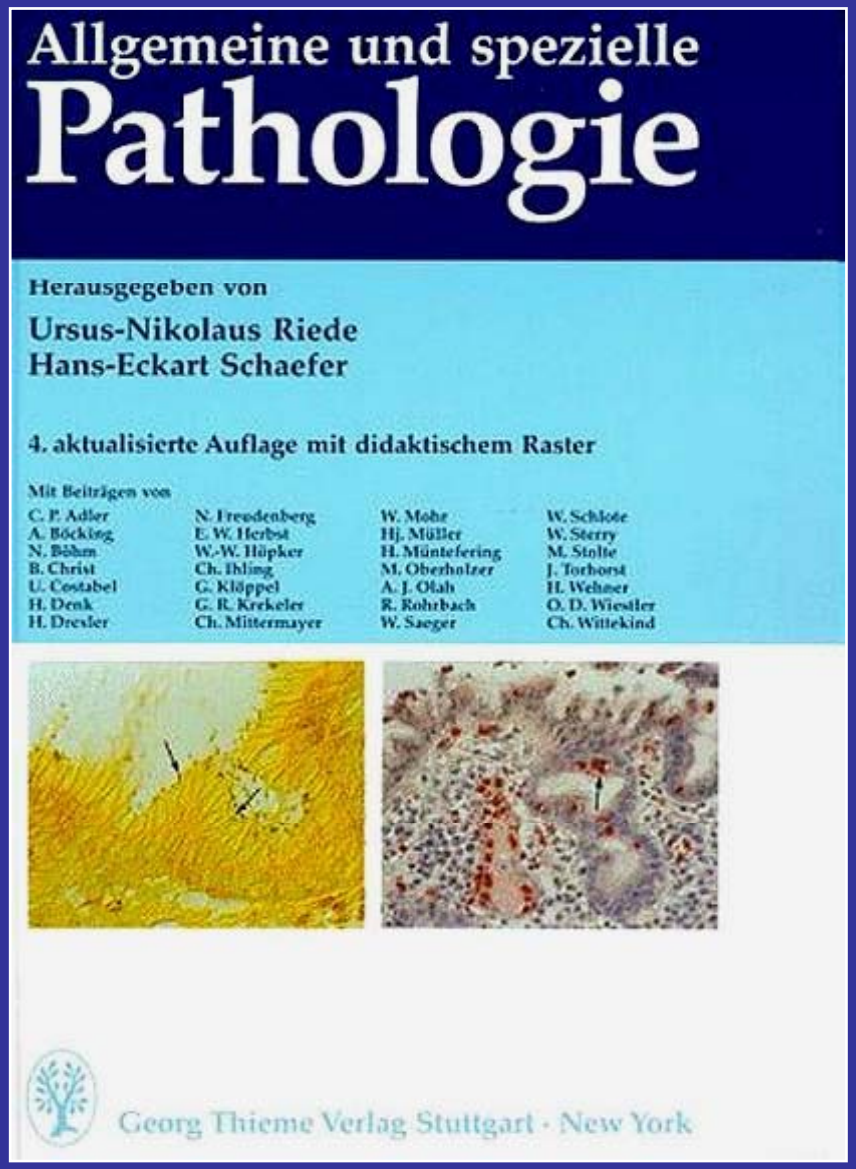
first edition 1986 **second edition 1988**

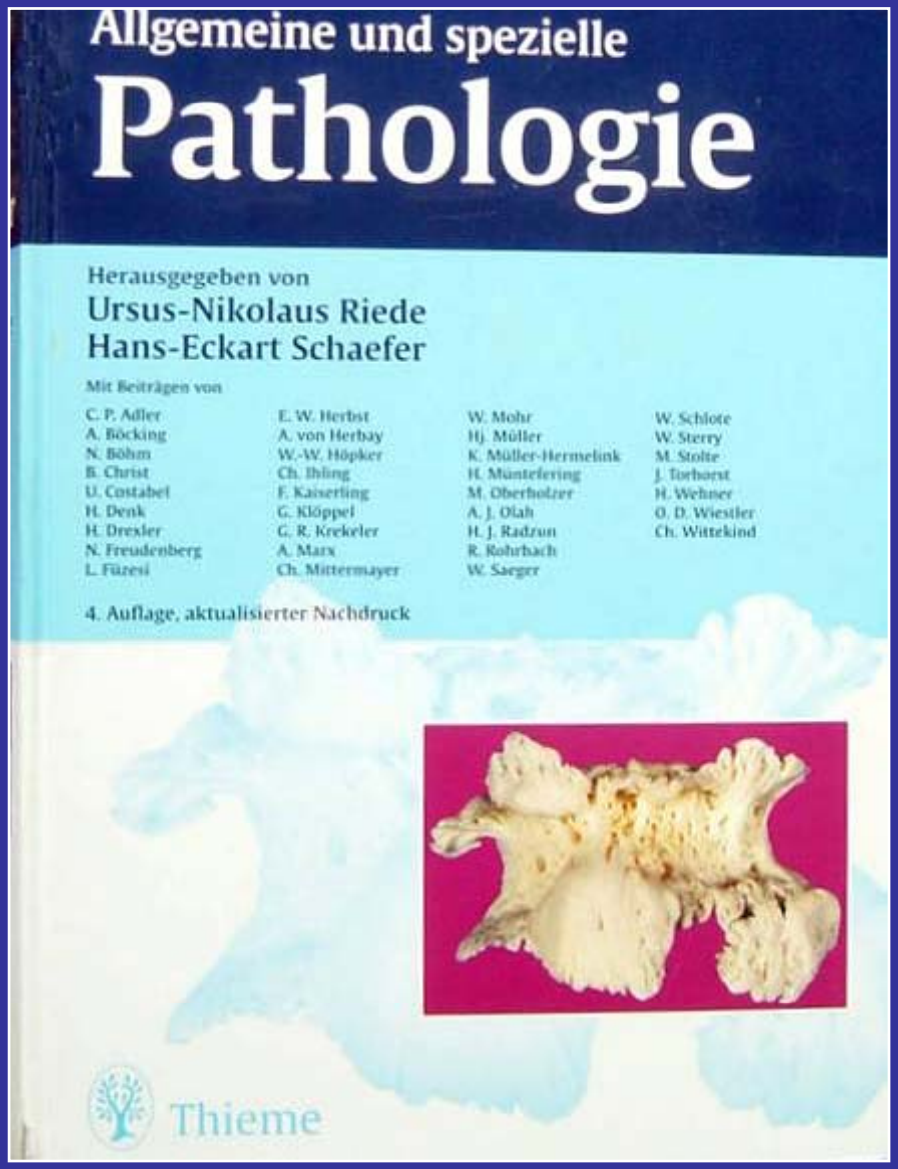




Textbook: **Georg Thieme, Stuttgart – New York**

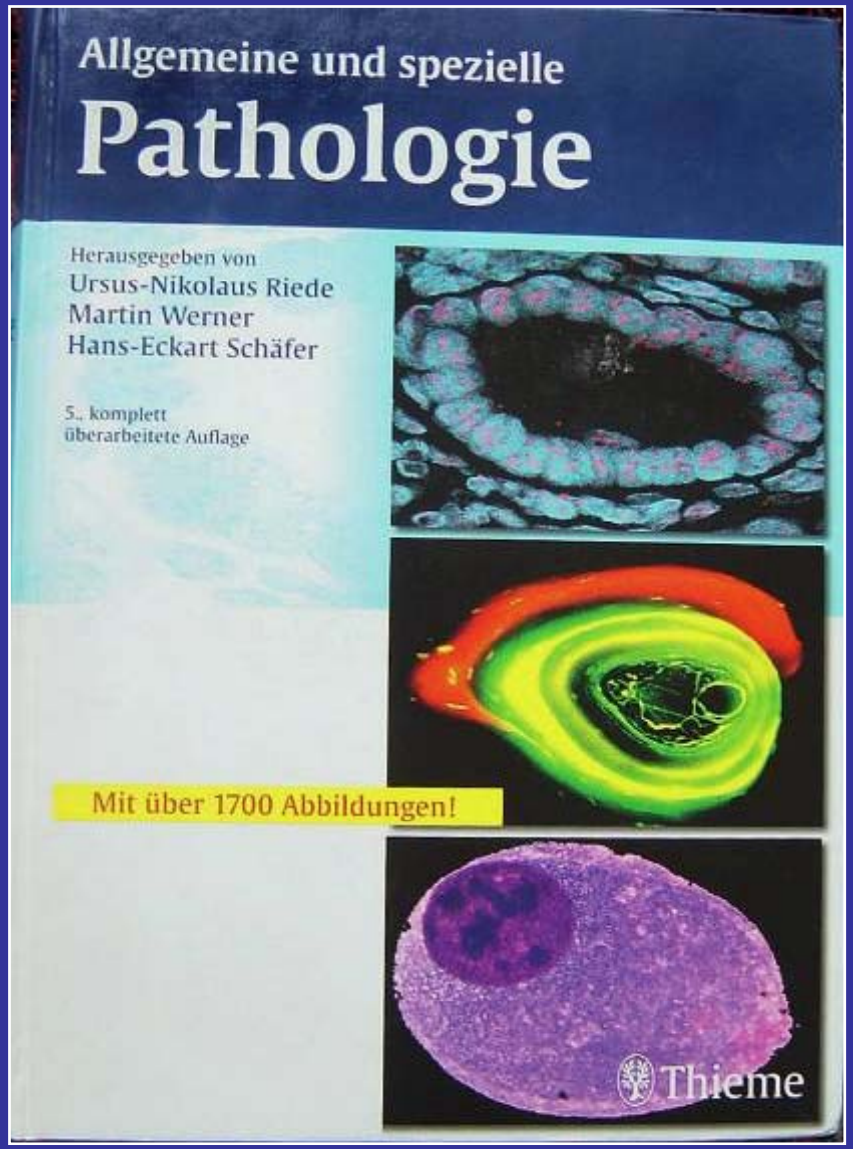
third edition 1992 **forth edition 1998**

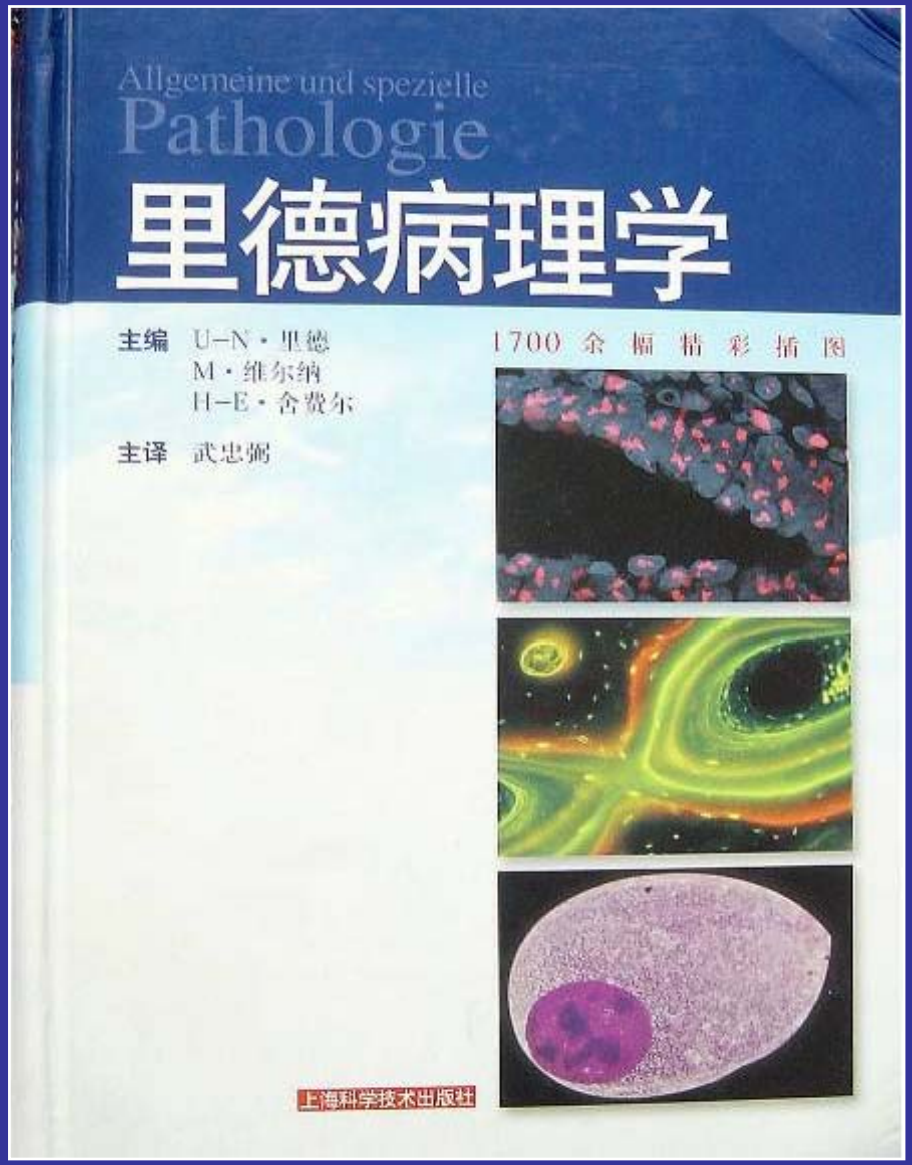




Textbook: **Georg Thieme, Stuttgart – New York**

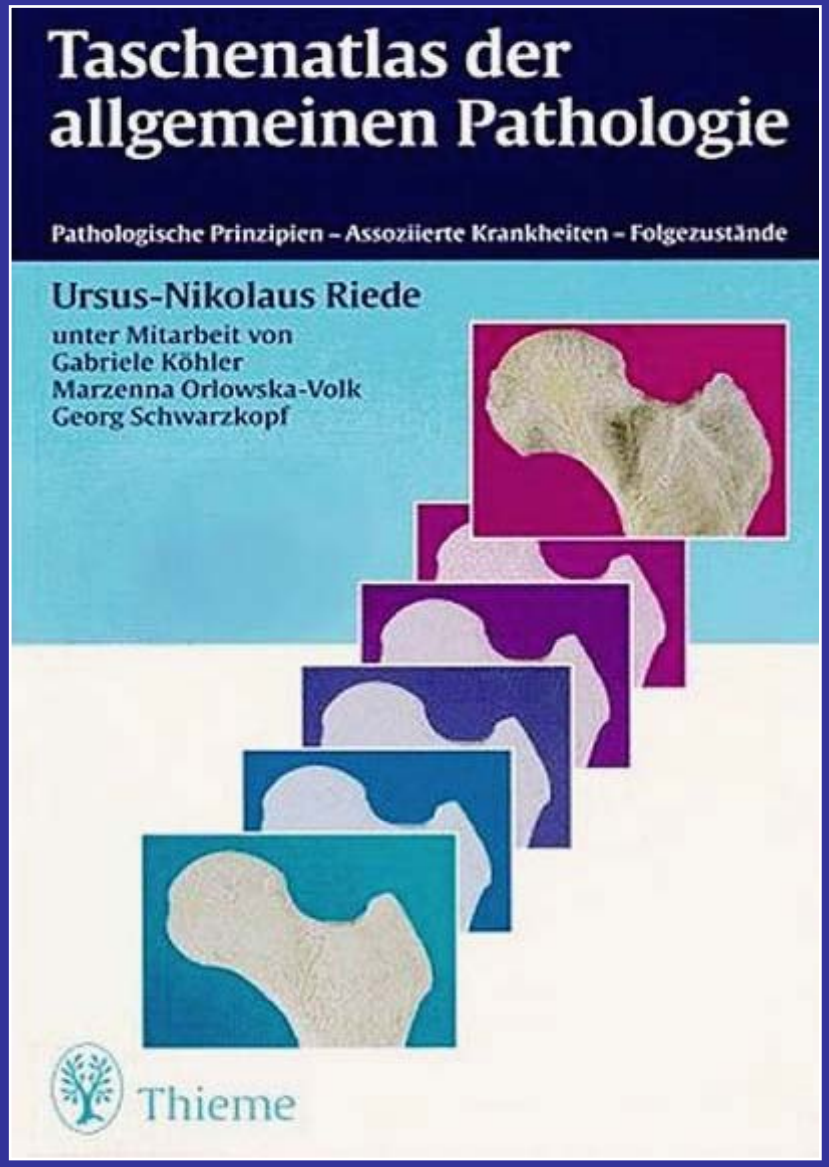
fifth edition 2004 **chinese editions 1998, 2004**

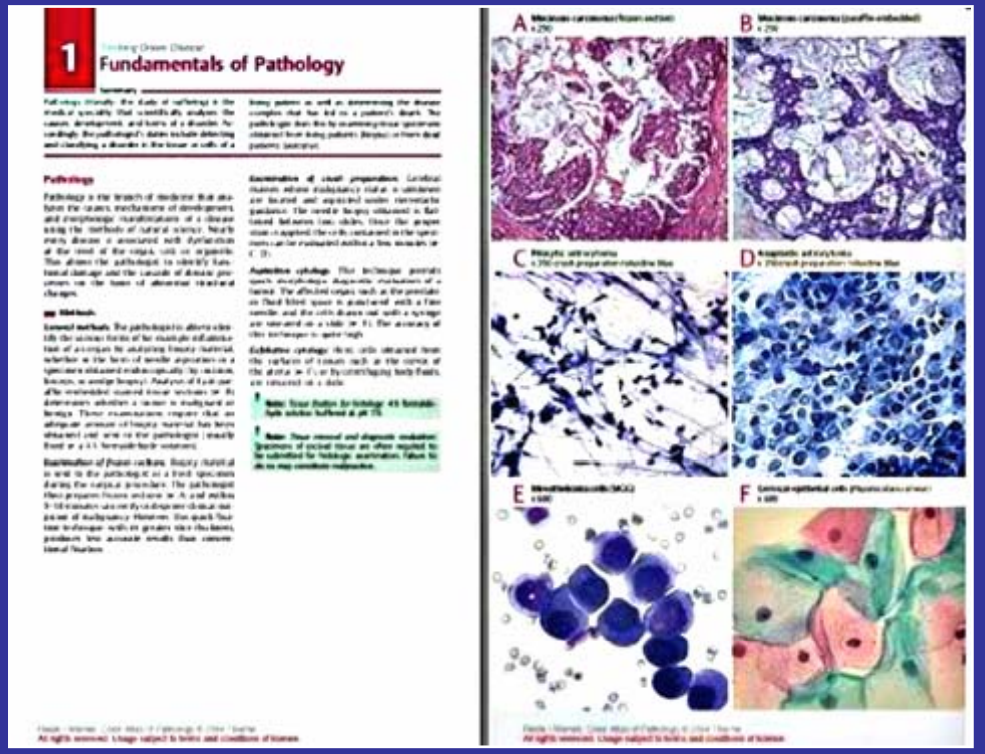




Color atlas: Georg Thieme, Stuttgart – New York

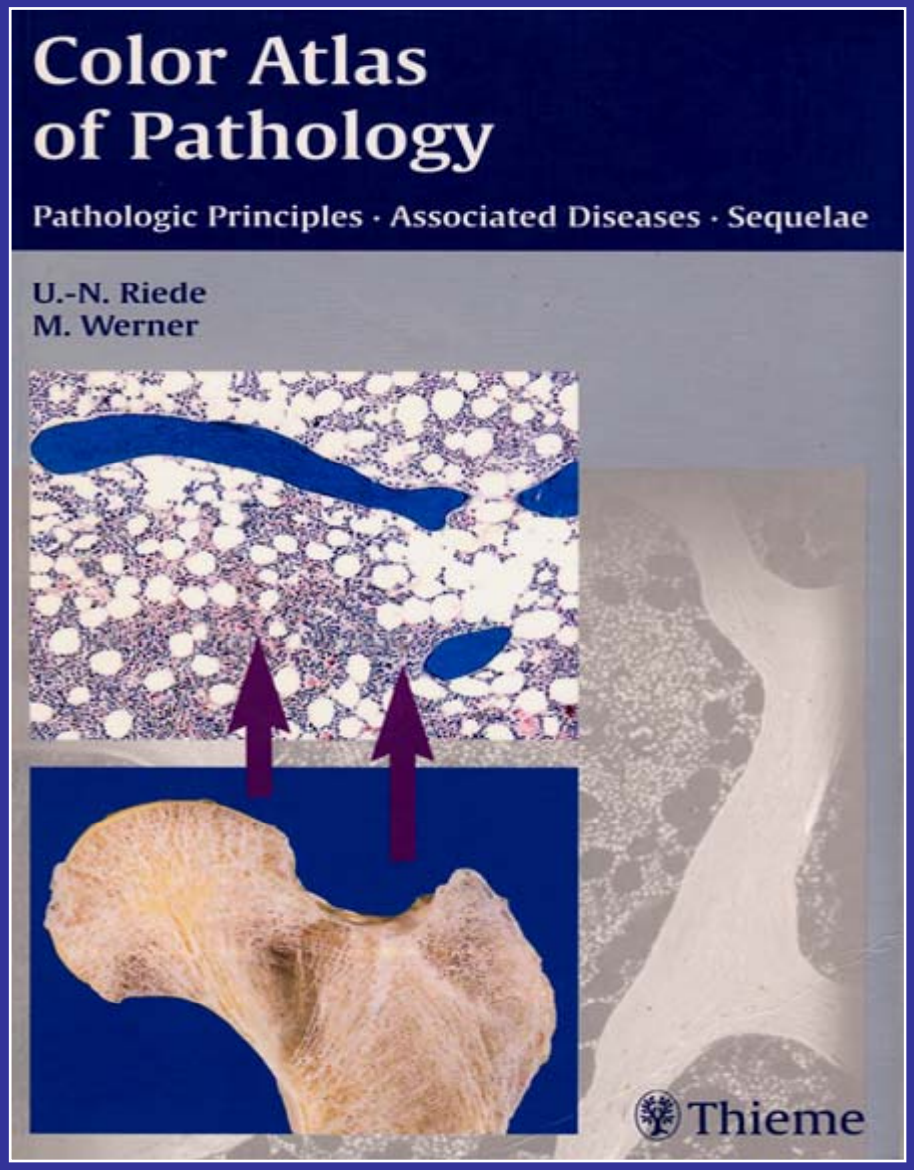
german edition 1998

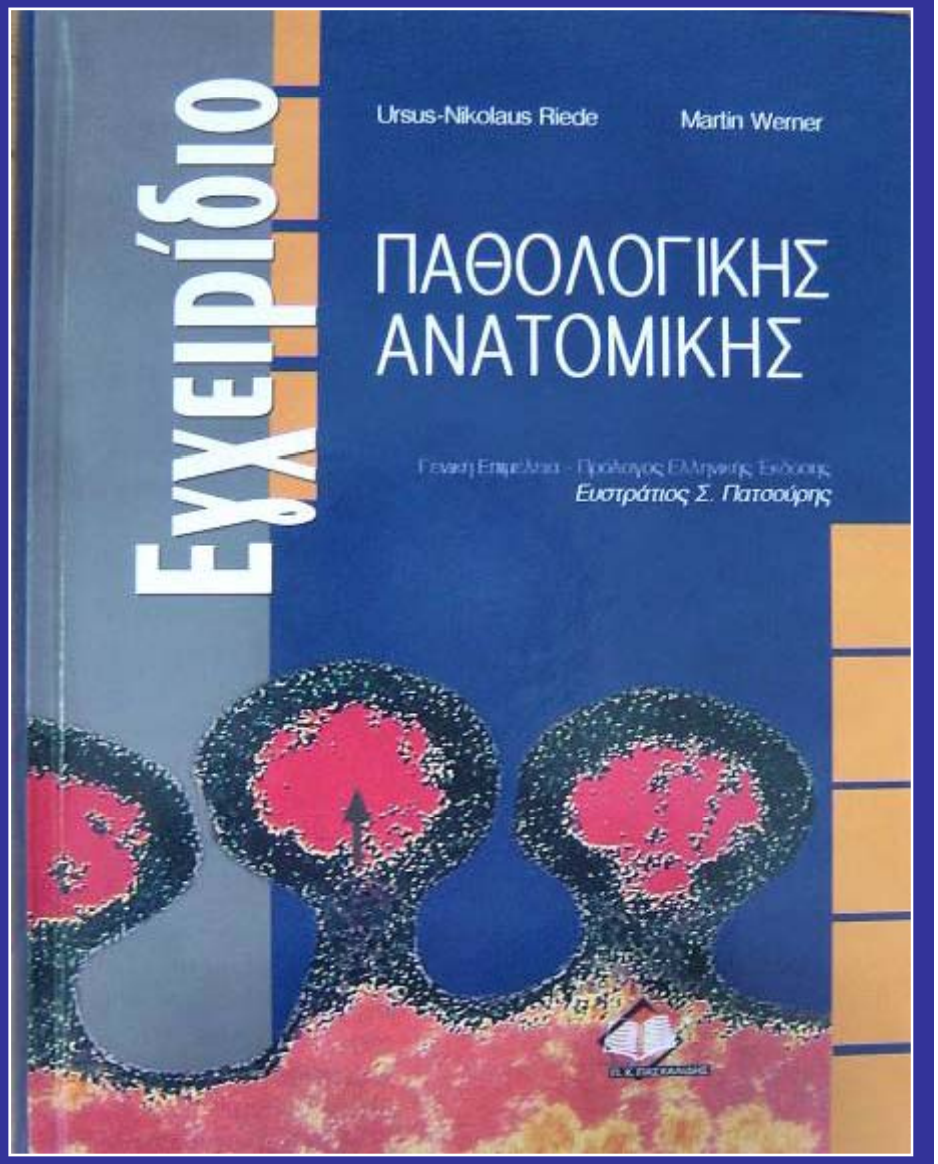




Color atlas: Georg Thieme, Stuttgart – New York

english edition 2008 **greek edition 2009**





teaching in pathology: aims

- The pathologic diagnosis of a disease results from the superposition of formal reaction patterns.
- The diagnosis of formal reaction patterns requires the analysis of a few structural and color changes.
- The stepwise analysis of the formal reaction patterns elucidates the progress of a disease.

Textbook: Springer Heidelberg – New York – Tokyo 2009

BASICS IN GENERAL AND SPECIAL PATHOLOGY

new:

learning modules

- **structural pattern**
- **contour pattern**
- **consistency pattern**
- **color pattern …**

teaching in pathology: modules

- Substructuring of a lesion into formal reaction patterns
- Pathobiologic explanation of the reaction patterns
- Assembling of distinct reaction patterns to a diagnosis
- Reconstruction of the pathogenetic sequence
- Training by cases of a virtual autopsy

quick-fix diagnosis:

facial skin lesions

The patient suffered from lupus erythematodes

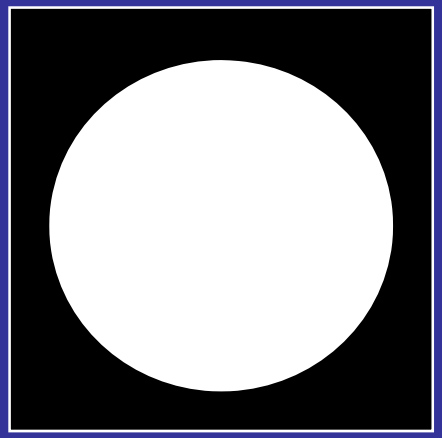
But why did she die?

diagnosis by pattern analysis

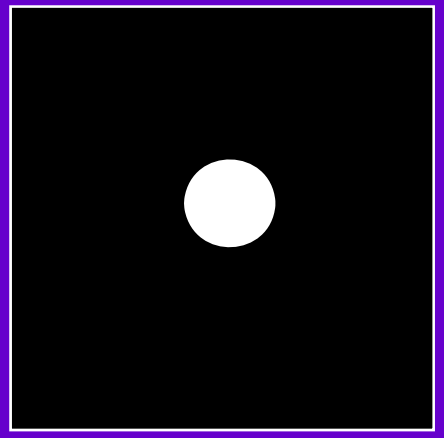
color	red
pattern	- inflammation - bleeding disorder
formal	macrofocal
pattern	- lupus erythema
	microfocal
	- purpura
distribution	multiple
pattern	- septic purpura

patterns of expansion

macrofocal

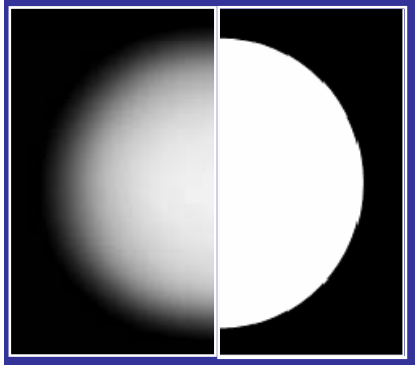


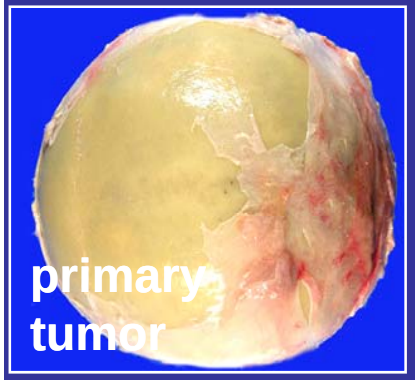
microfocal



patterns of distribution

(uni-) macrofocal



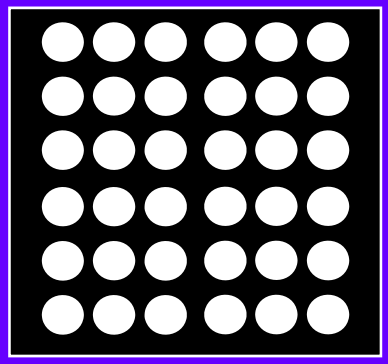


multifocal

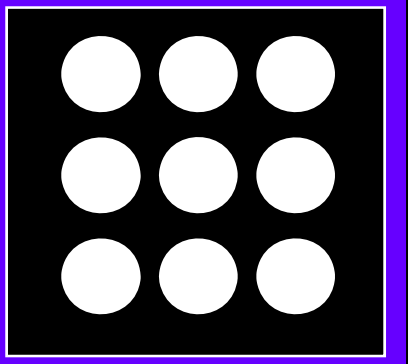
systemic

generalised

microfocal

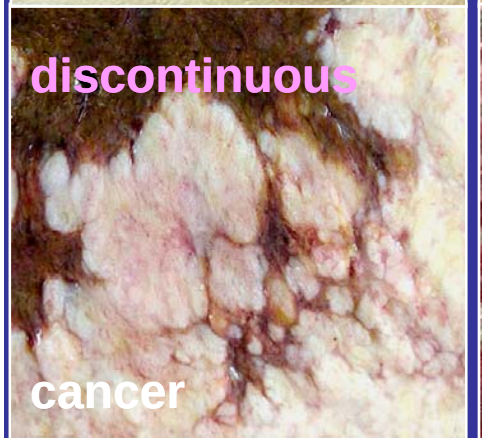


macrofocal

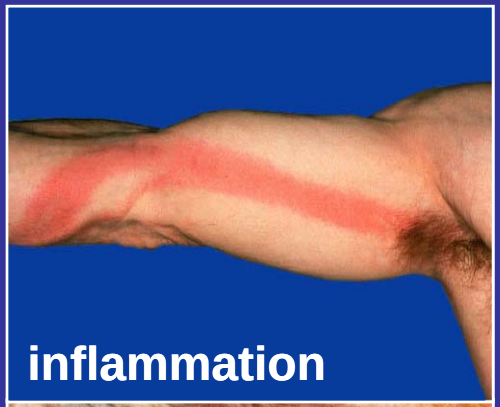


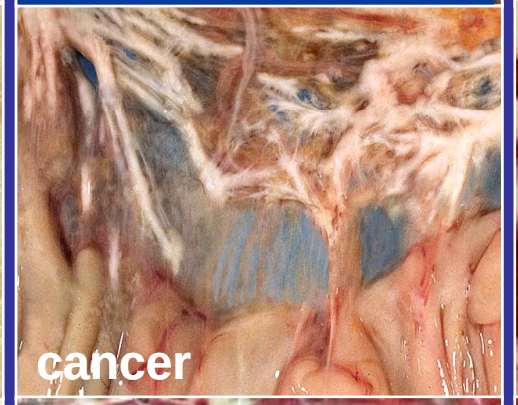
spreading patterns

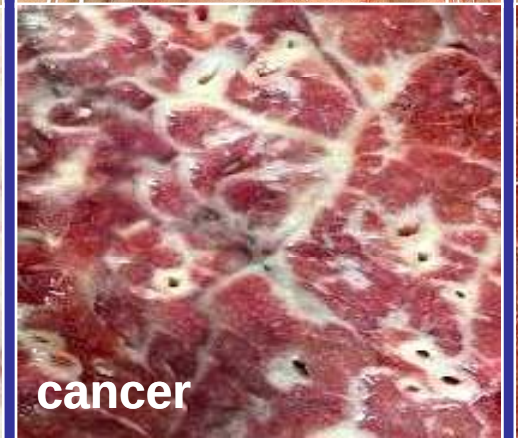
dis-/continuous



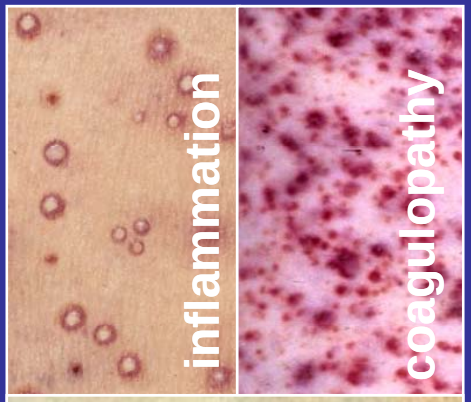
lymphatic

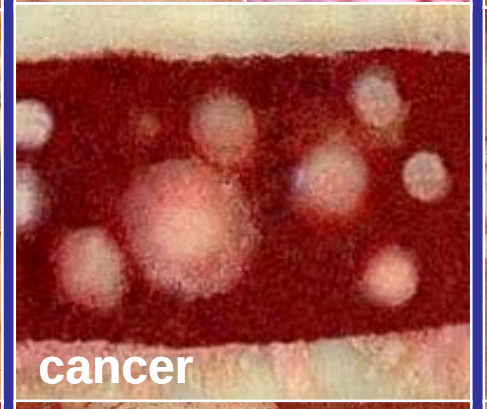


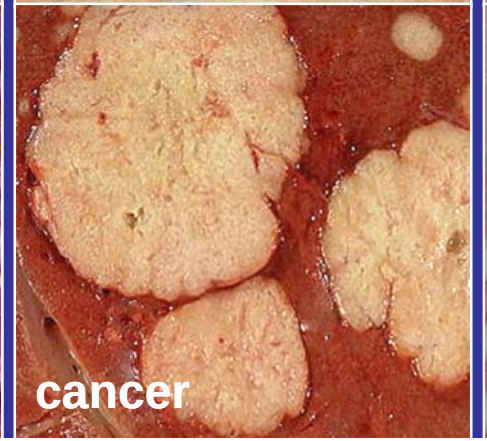




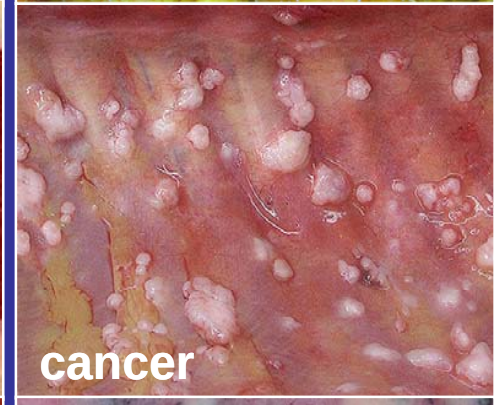
haematogenous

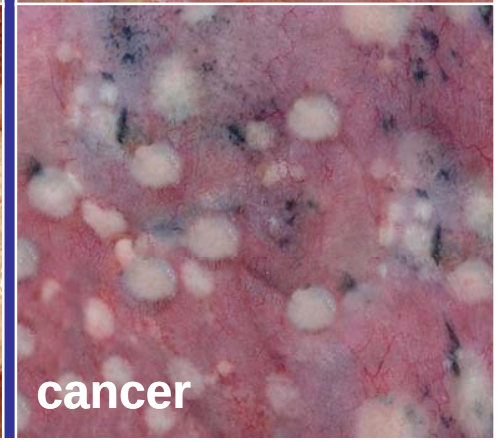






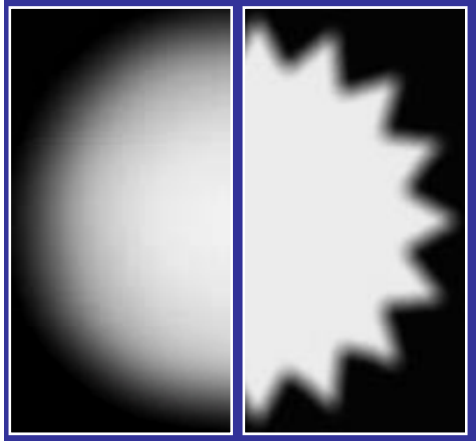
cavitary





contour patterns

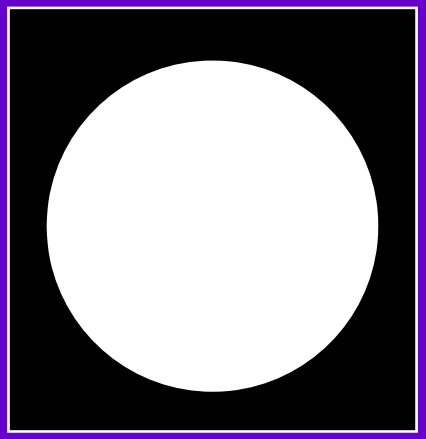
fuzzy contours

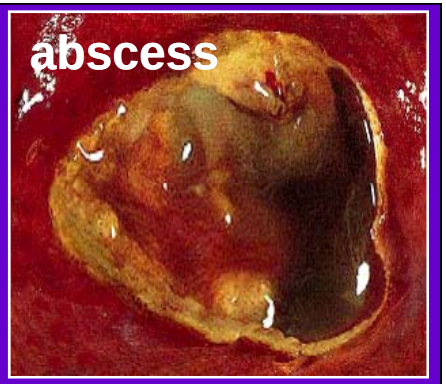


instillation / infiltration:

- gaz > emphysema
- water > edema
- cells > inflammation
  > malignoma

sharp contours





destruction:

- ischemia > infarction
- inflammation > abscess

proliferation: > benignoma

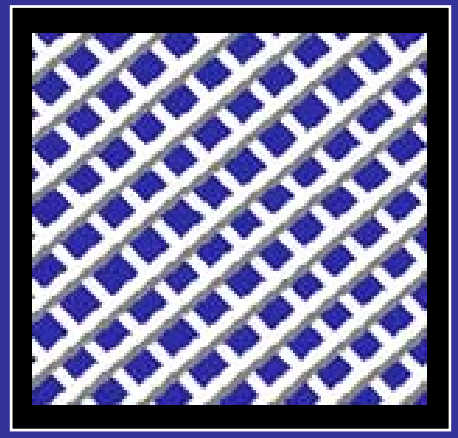
retention: > (pseudo) cyst

structural patterns

diffuse

striped

netlike
reticular



whirled

erythema

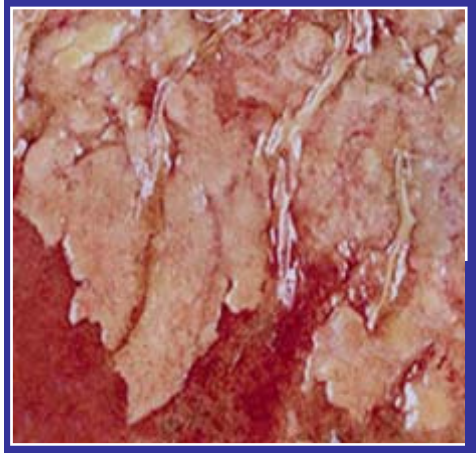
fat interposition

lymphangiosis

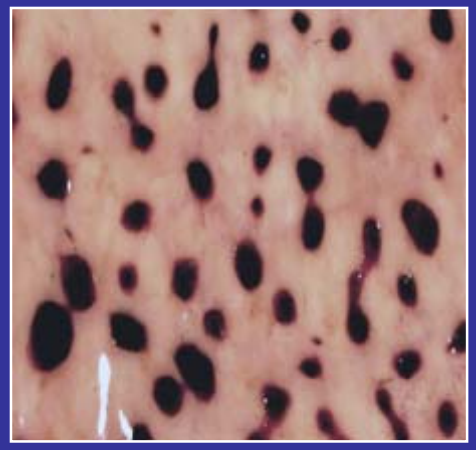
fibroma

surface patterns

pseudo-membrane



erosion



ulcer

polyp

epidermis
mucosa

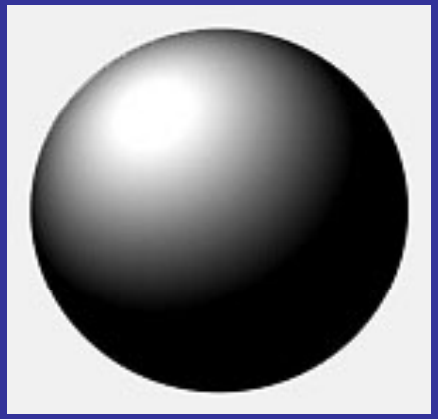
subcutis
submucosa

steric patterns

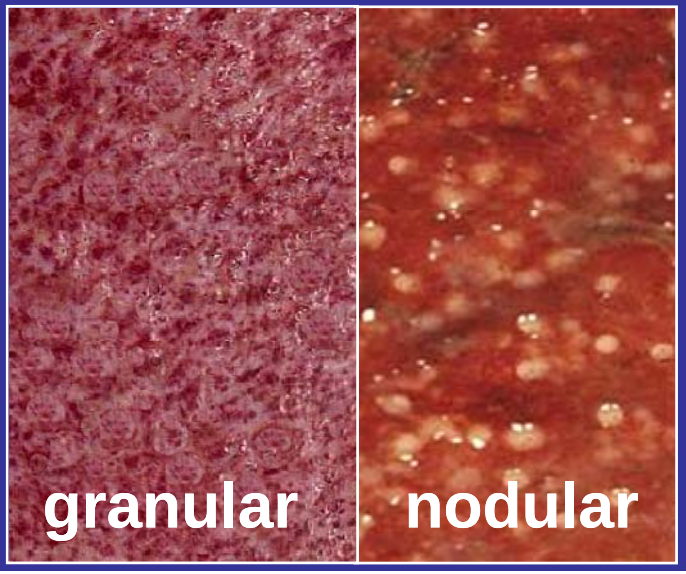
diffuse

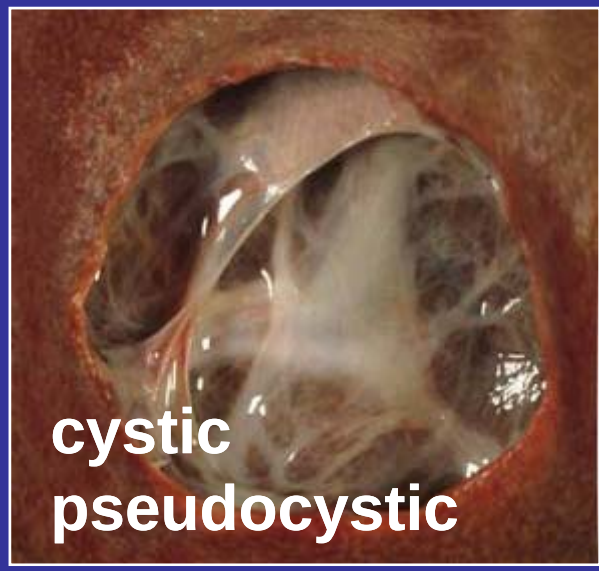
sphere

- large: nodular
- small: granular

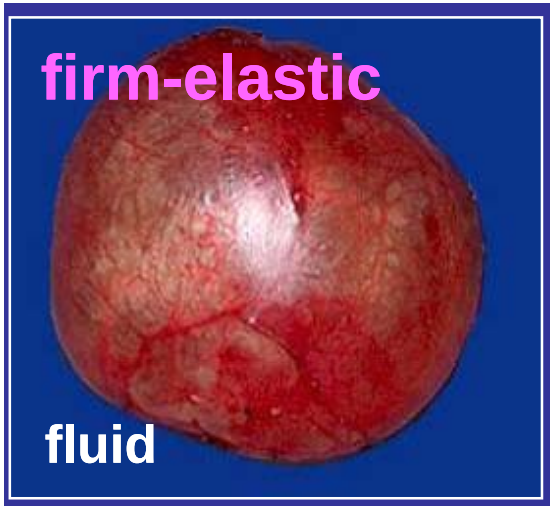


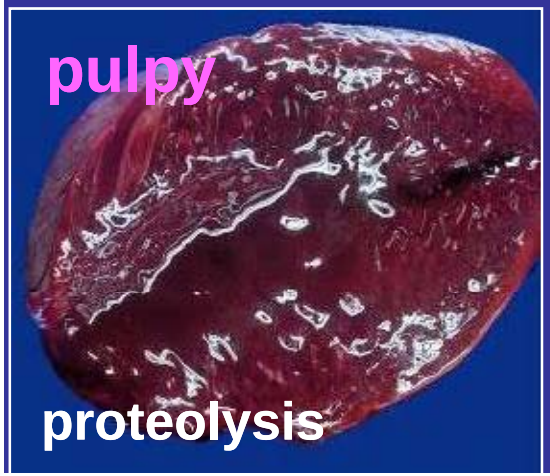
hollow sphere

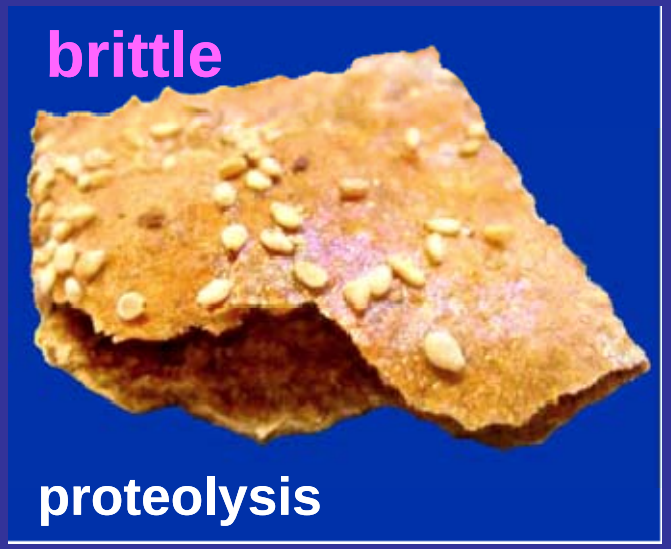


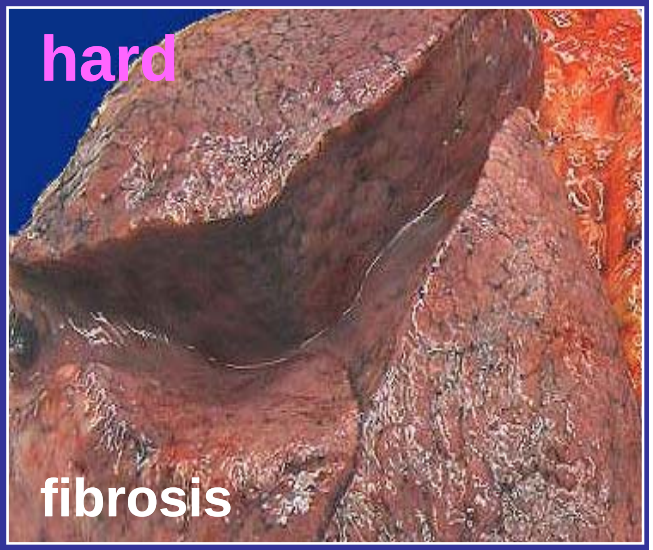


consistency patterns

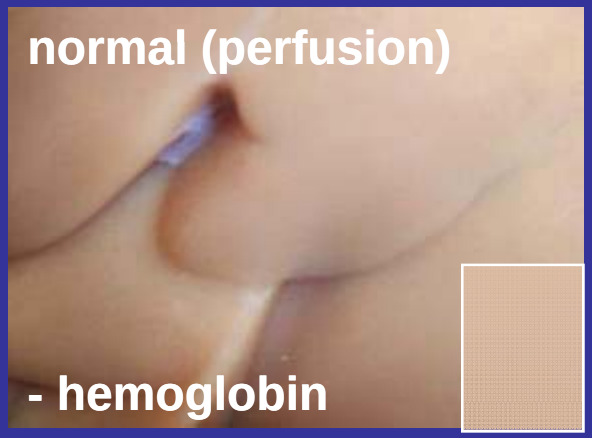


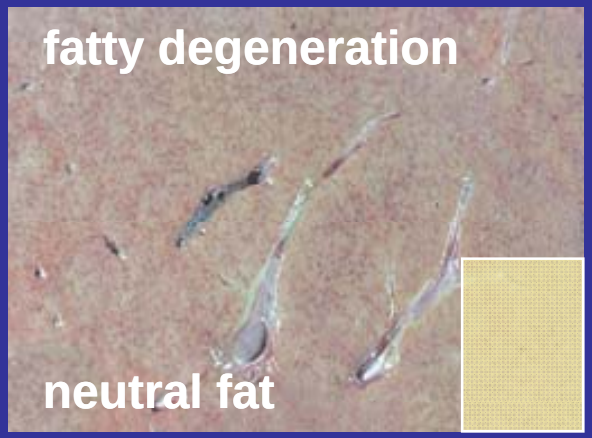


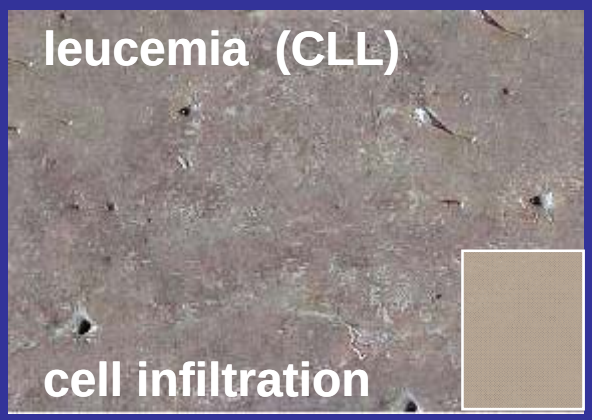


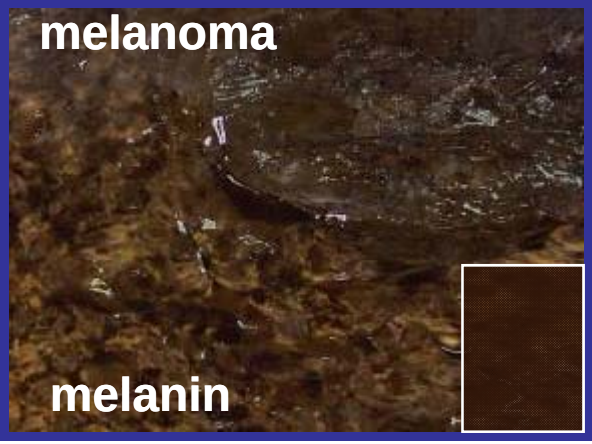


color patterns: e.g. liver





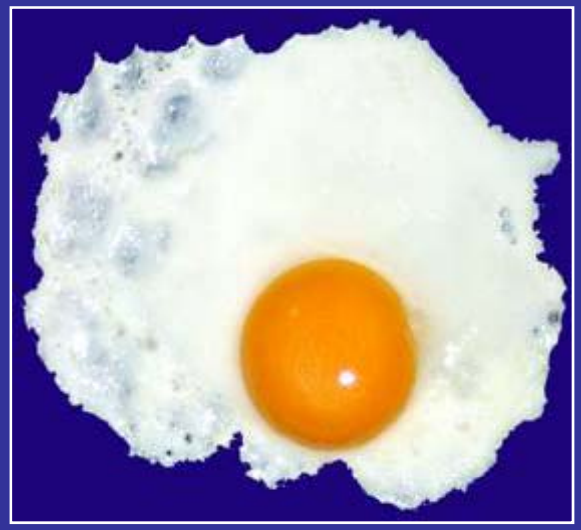




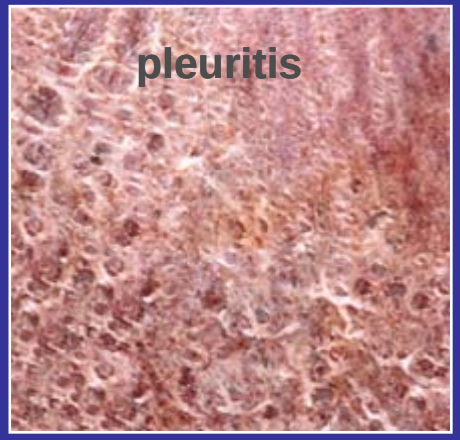
color patterns: white

Tyndall-effect because of

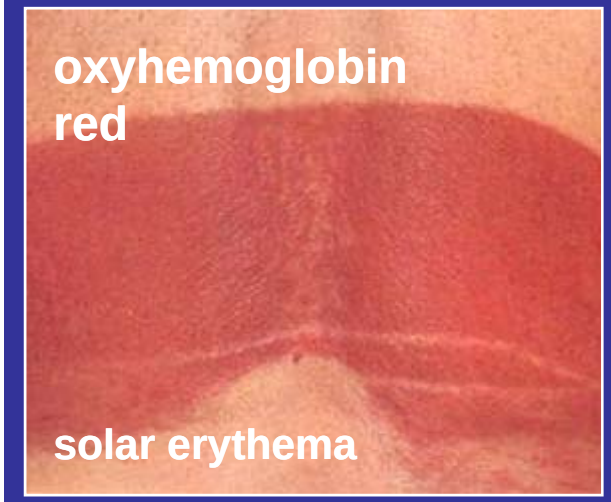
- coagulation
- increase of collagen
- increase of keratin
- increase of fibrin
- increase of cells

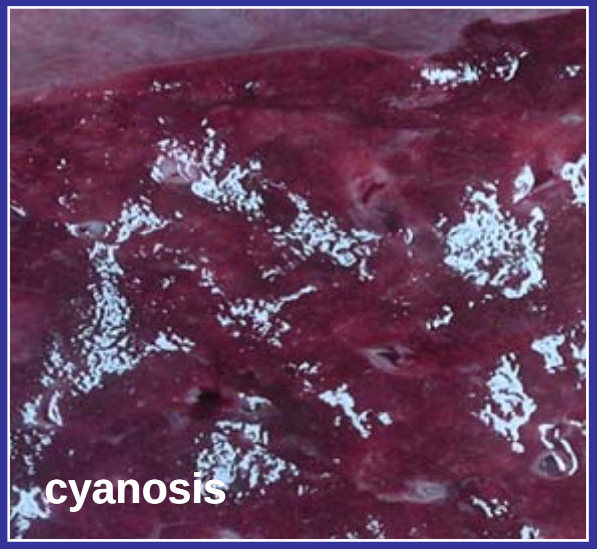


coagulation



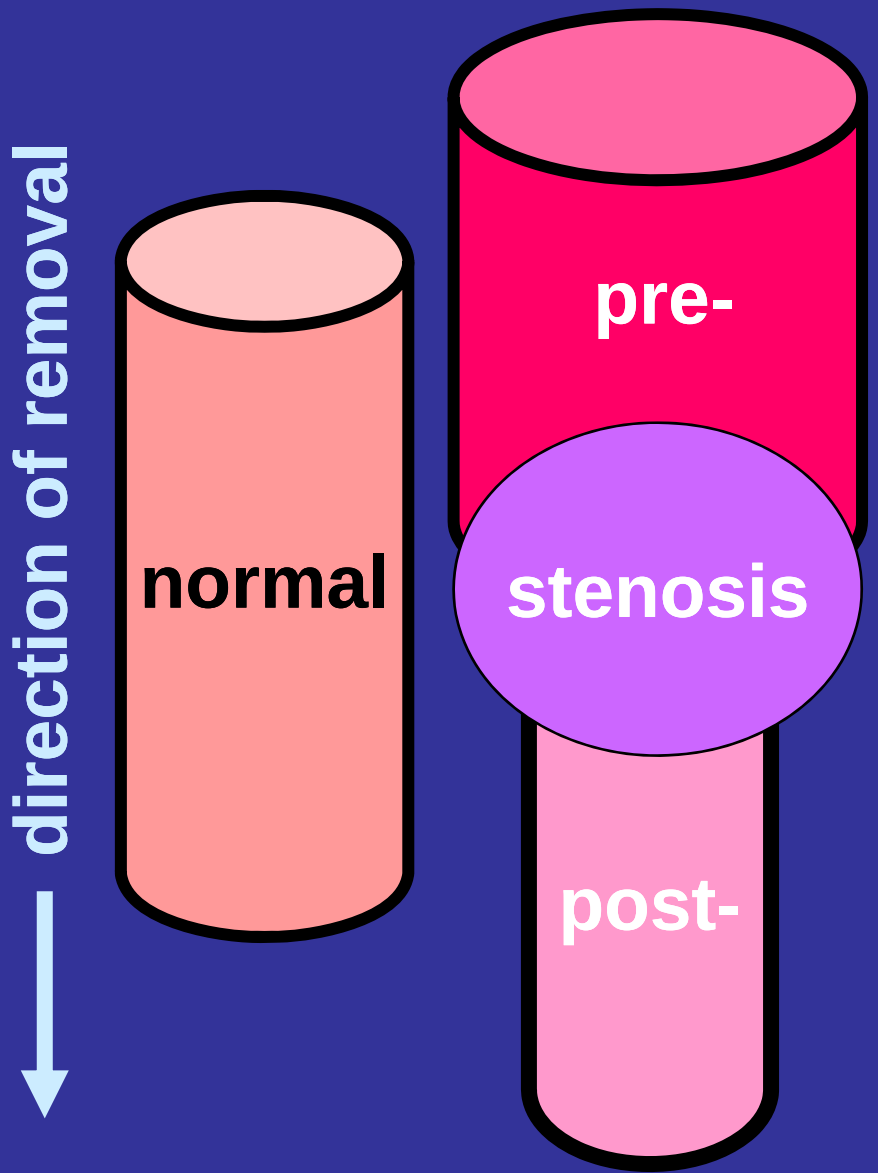
color patterns: red





patterns of hollow organs

patterns of stenosis



complications

- retention
- dilatation
- inflammation
- hyperplasia

- thrombus/embolus
- neoplastic tumor
- inflammatory tumor
- foreign body
- ligatur / accretion

- dysfunction
- atrophy

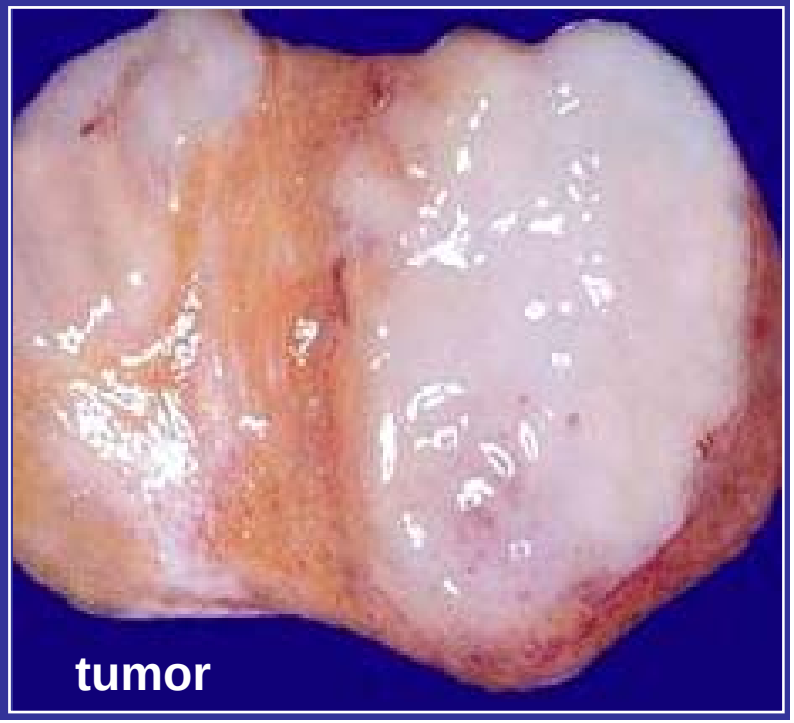
case history

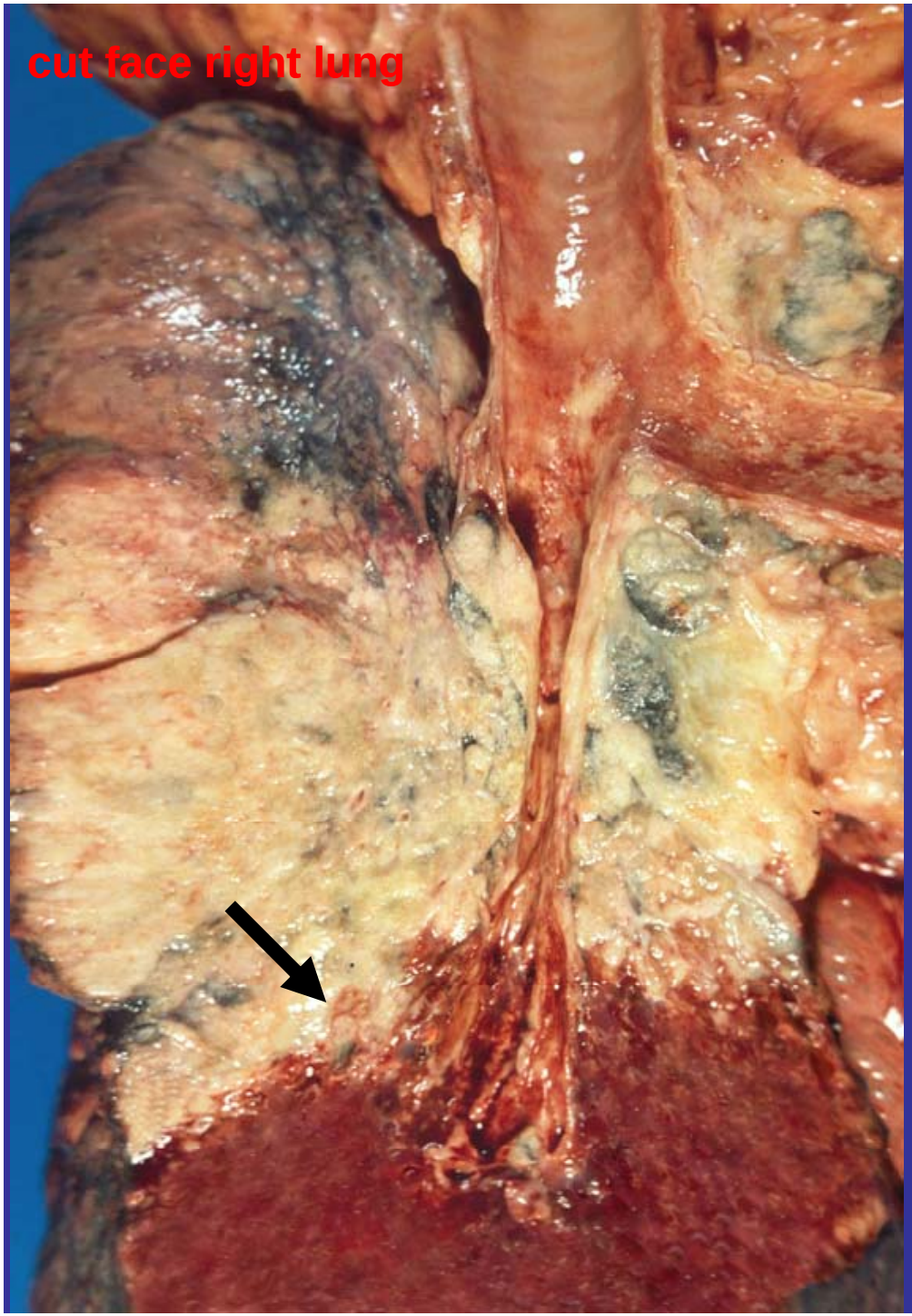
- 48 year-old patient
- cigarette smoker (27 pack years)
- onset: flu-like symptoms (caugh, fatigue)
- x-ray: suspicion of pneumonia > antibiotics
- recurrent pericardial + pleural effusions
- back pain
- accelerating respiratory insufficiency
- cachexia
- exitus

color pattern

of the lesion ?

- white > collagen increase
- white > fibrin increase
- white > keratin increase
- white > cell increase = tumor



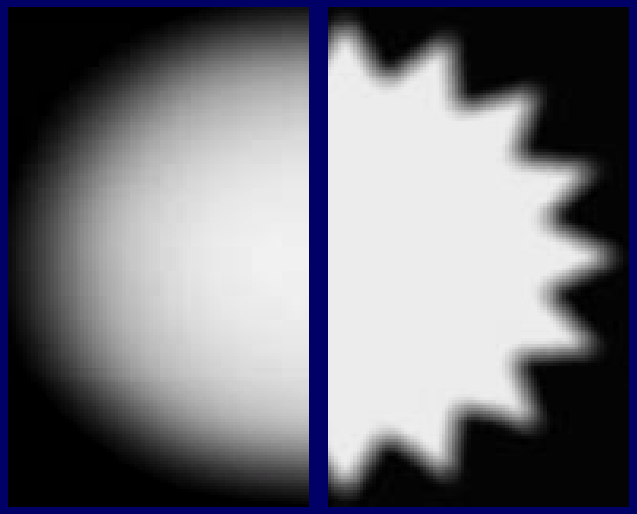


contour pattern

of the lesion?

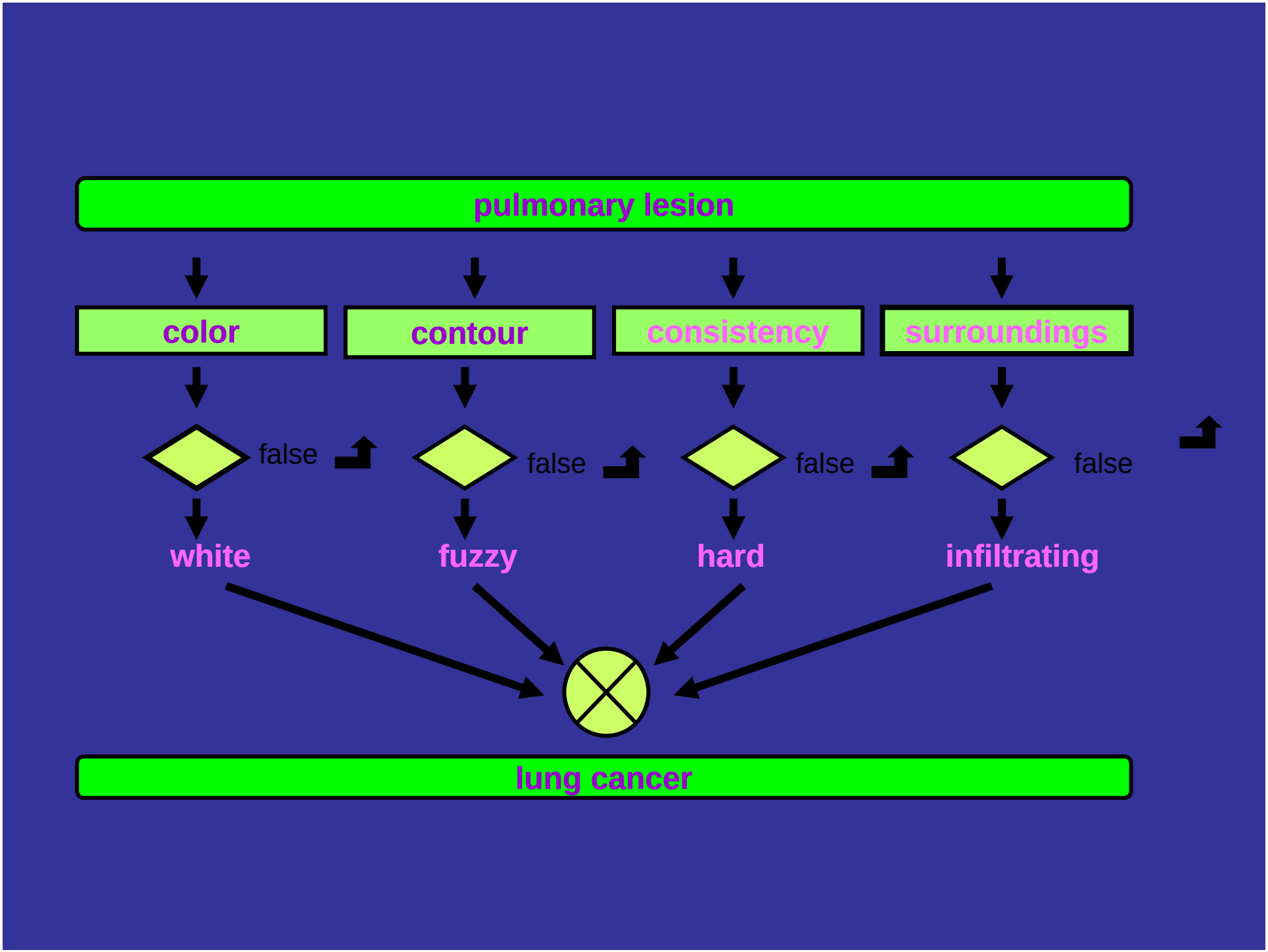
- sharp > encapsulation
- sharp > destruction
- fuzzy > edema
- fuzzy > infiltration

fuzzy contour



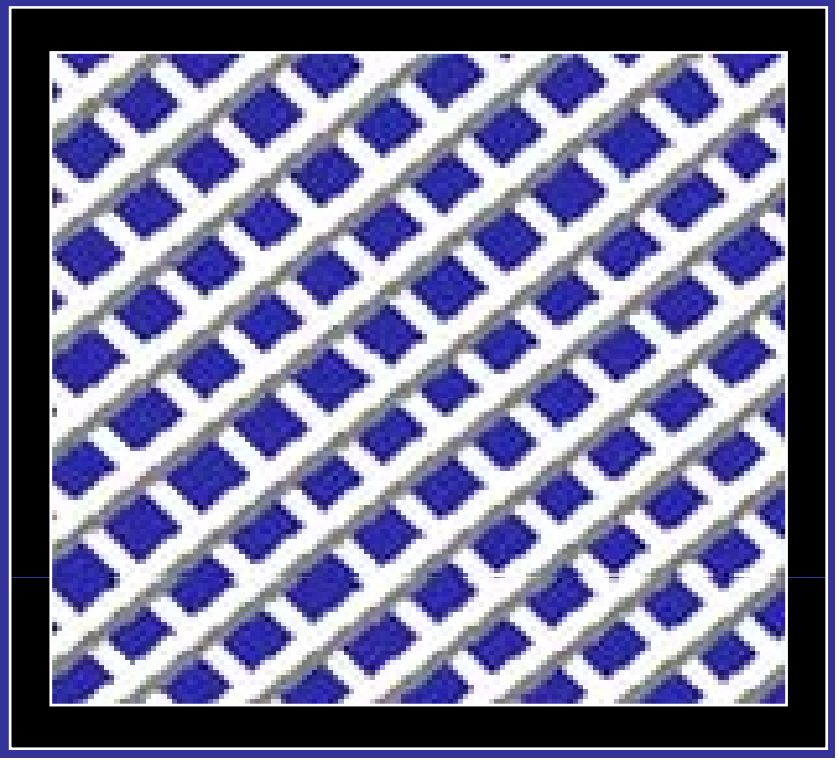
infiltration:

- water
- cells


pulmonary lesion
color
contour
consistency
surroundings
false
false
false
false
white
fuzzy
hard
infiltrating
lung cancer

formal pattern
of the lesion

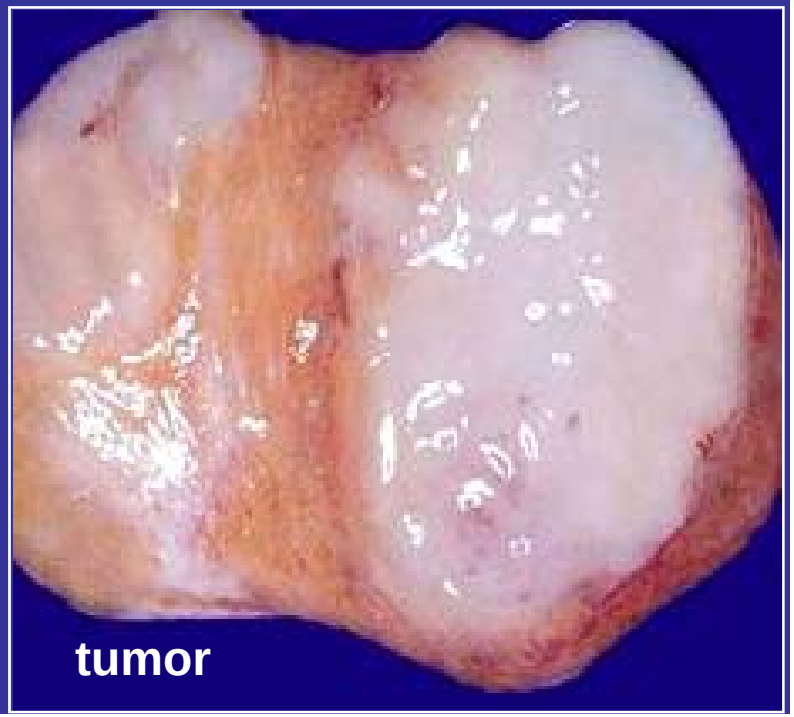
- unifocal pattern
- cystic pattern
- diffuse pattern
- reticular pattern

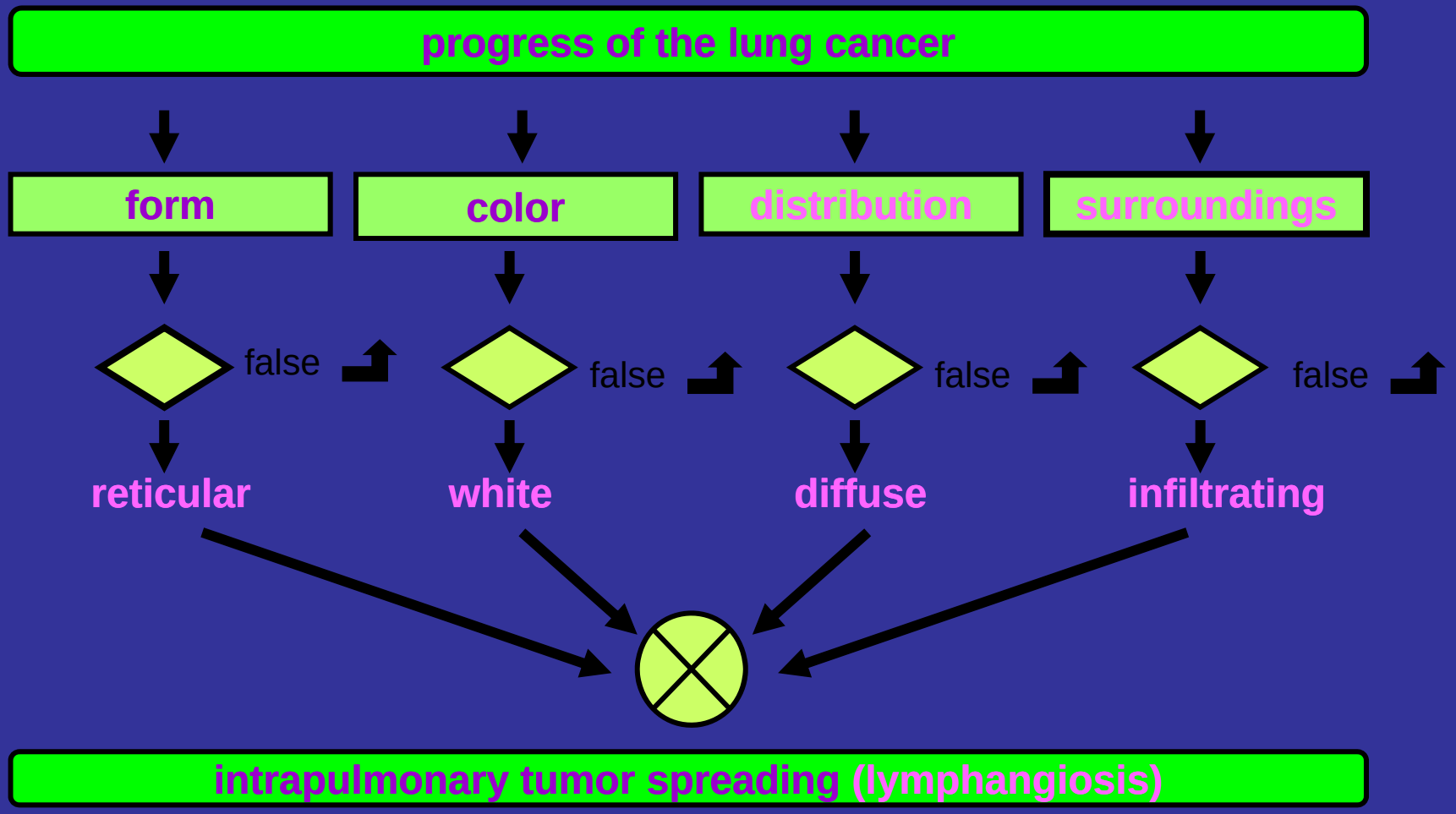


color pattern

of the lesion ?

- white > collagen increase
- white > fibrin increase
- white > necrotic coagulation
- white > tumor

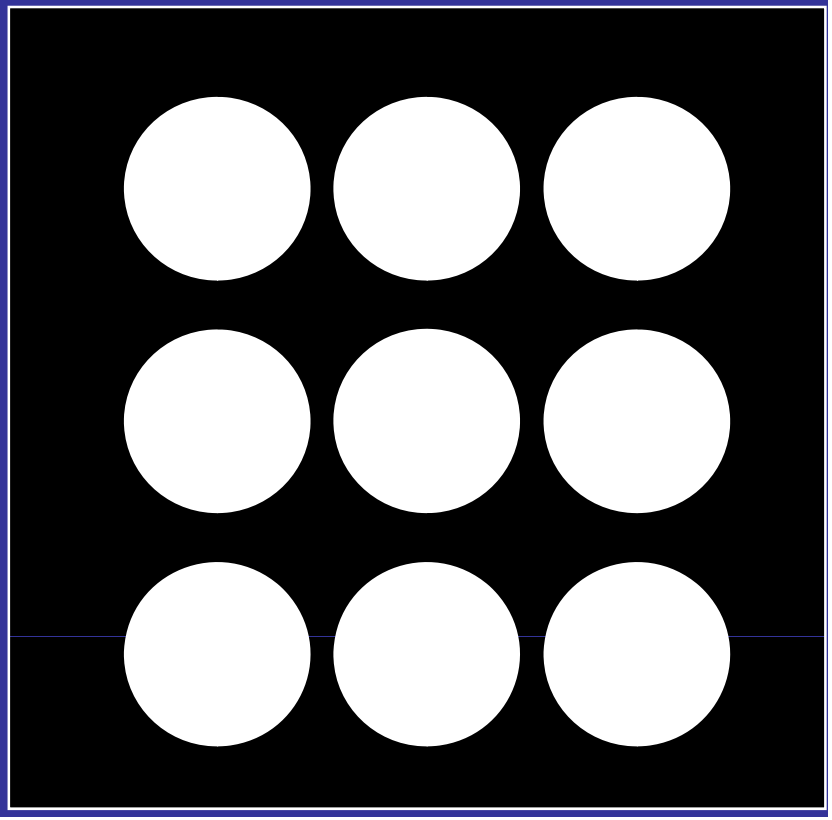



progress of the lung cancer
form
color
distribution
surroundings
false
false
false
false
reticular
white
diffuse
infiltrating
intrapulmonary tumor spreading (lymphangiosis)

formal pattern

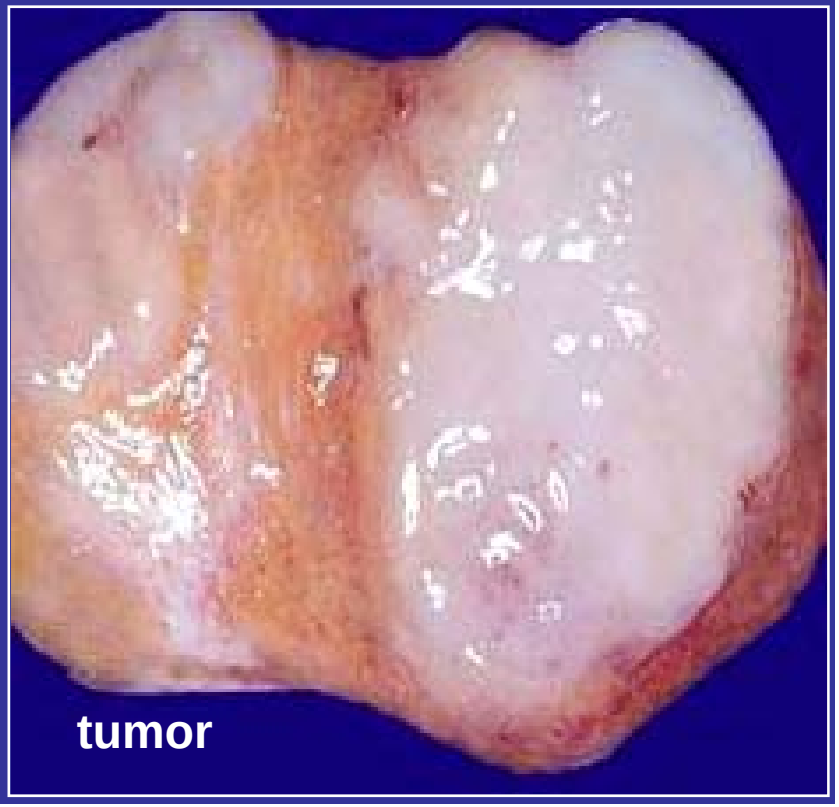
of the lesion ?

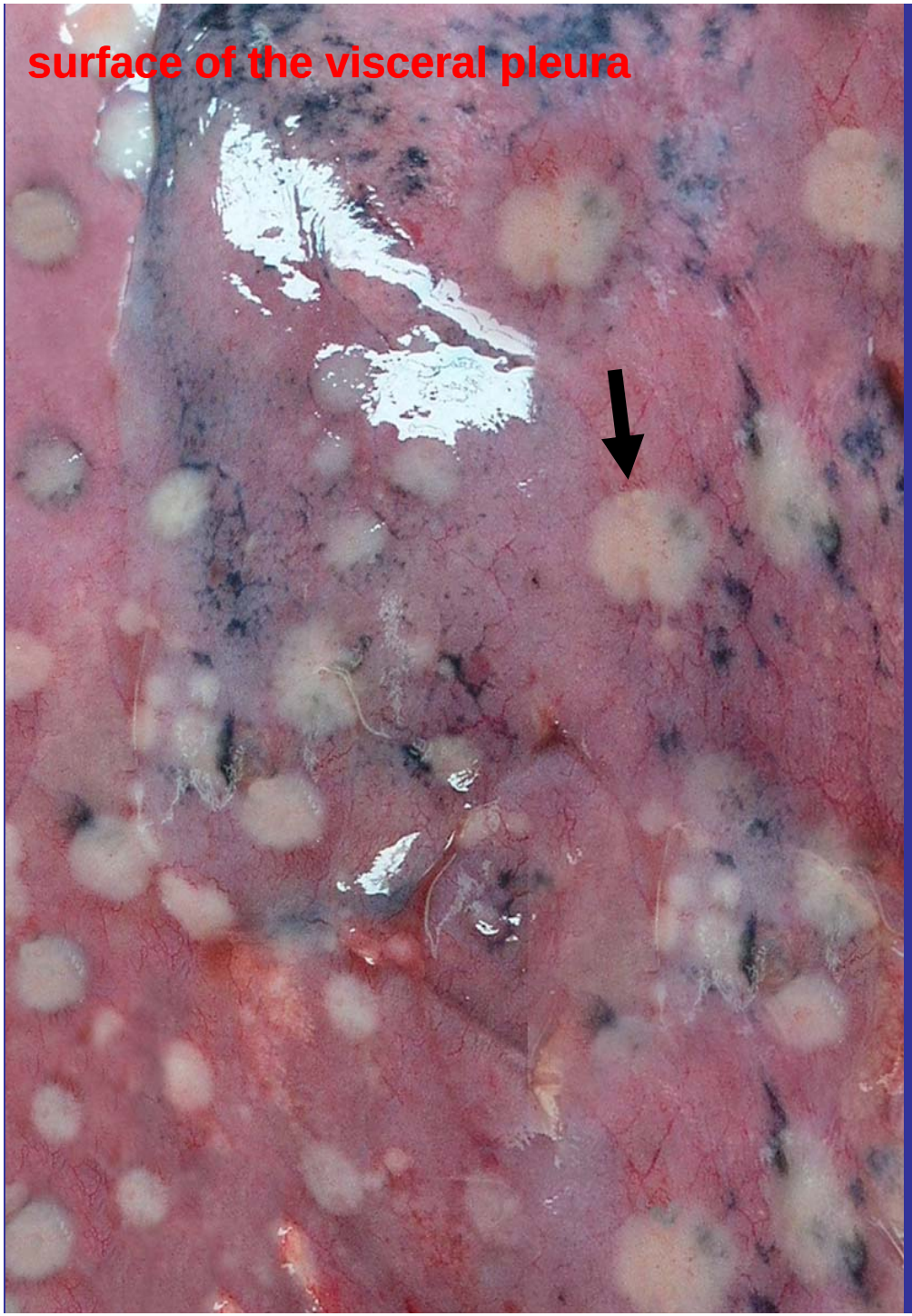
- cystic pattern
- reticular pattern
- diffuse pattern
- multinodular pattern



color pattern
of the lesion

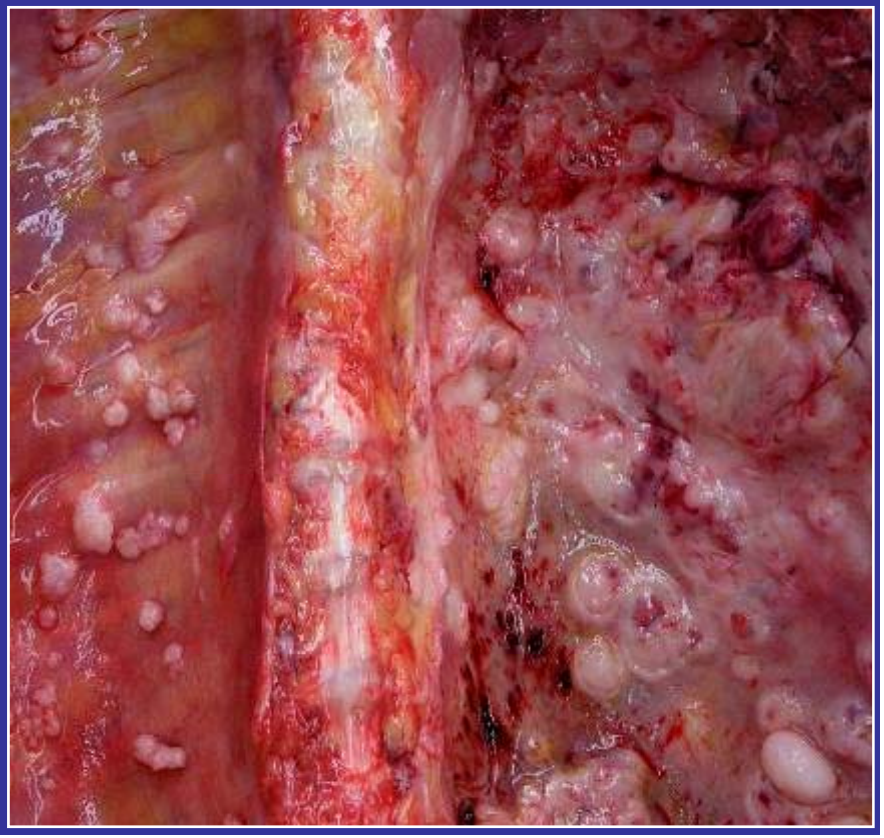
- white > collagen increase
- white > fibrin increase
- white > necrotic coagulation
- white > tumor

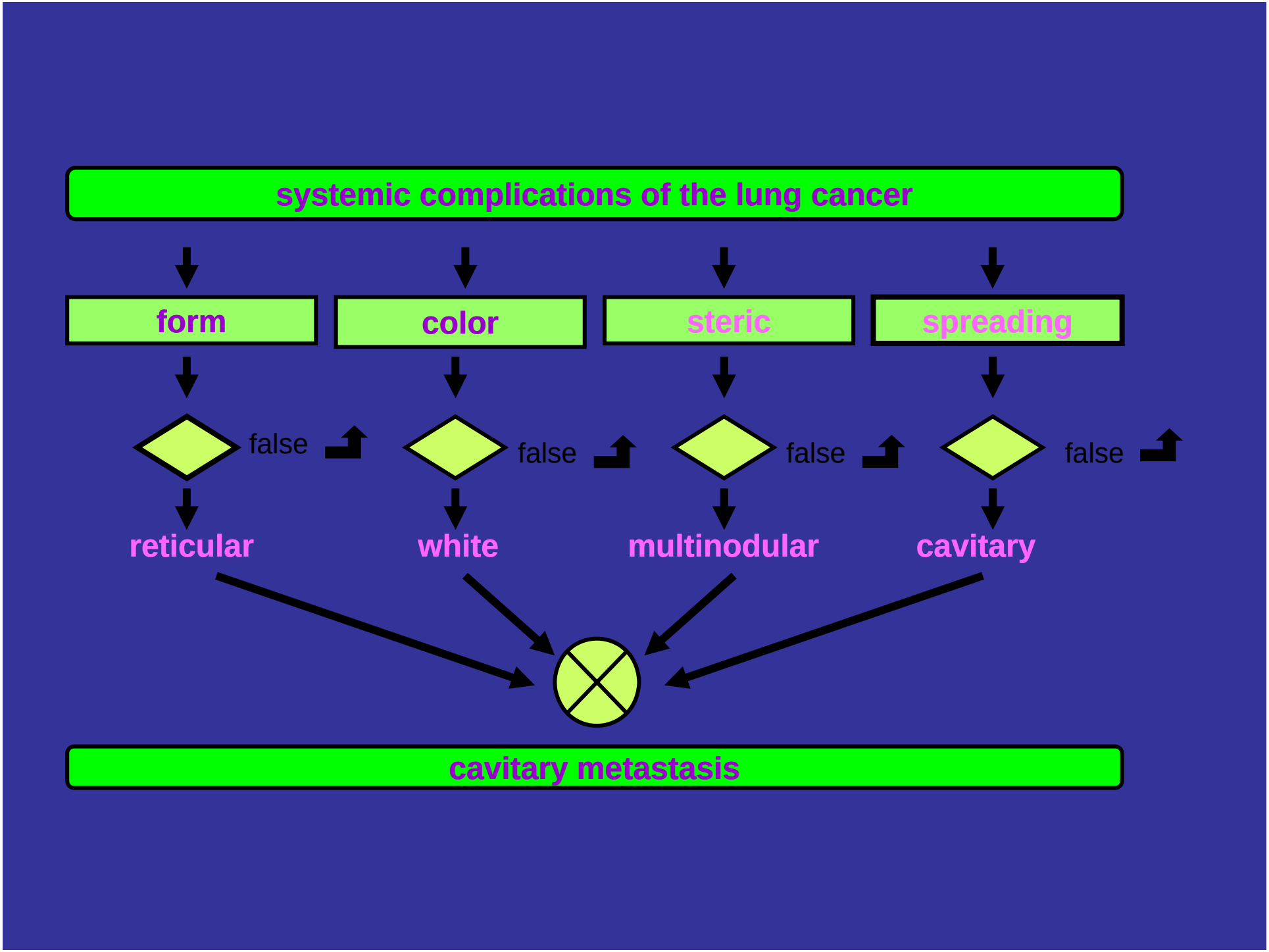


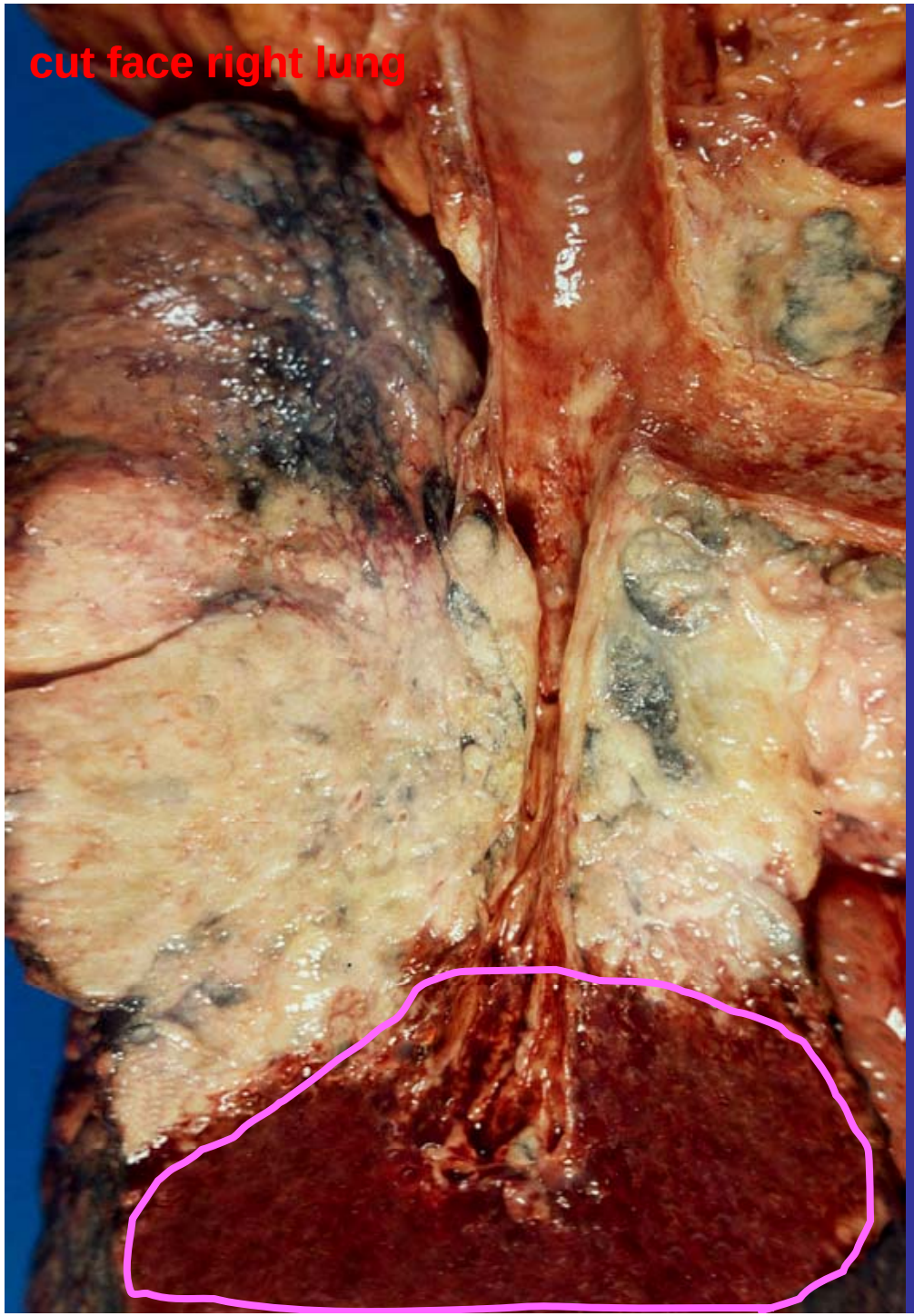


spreading pattern
of the lesion

- lymphogenous metastasis
- hematogenous metastasis
- ductogenous metastasis
- cavitary metastasis



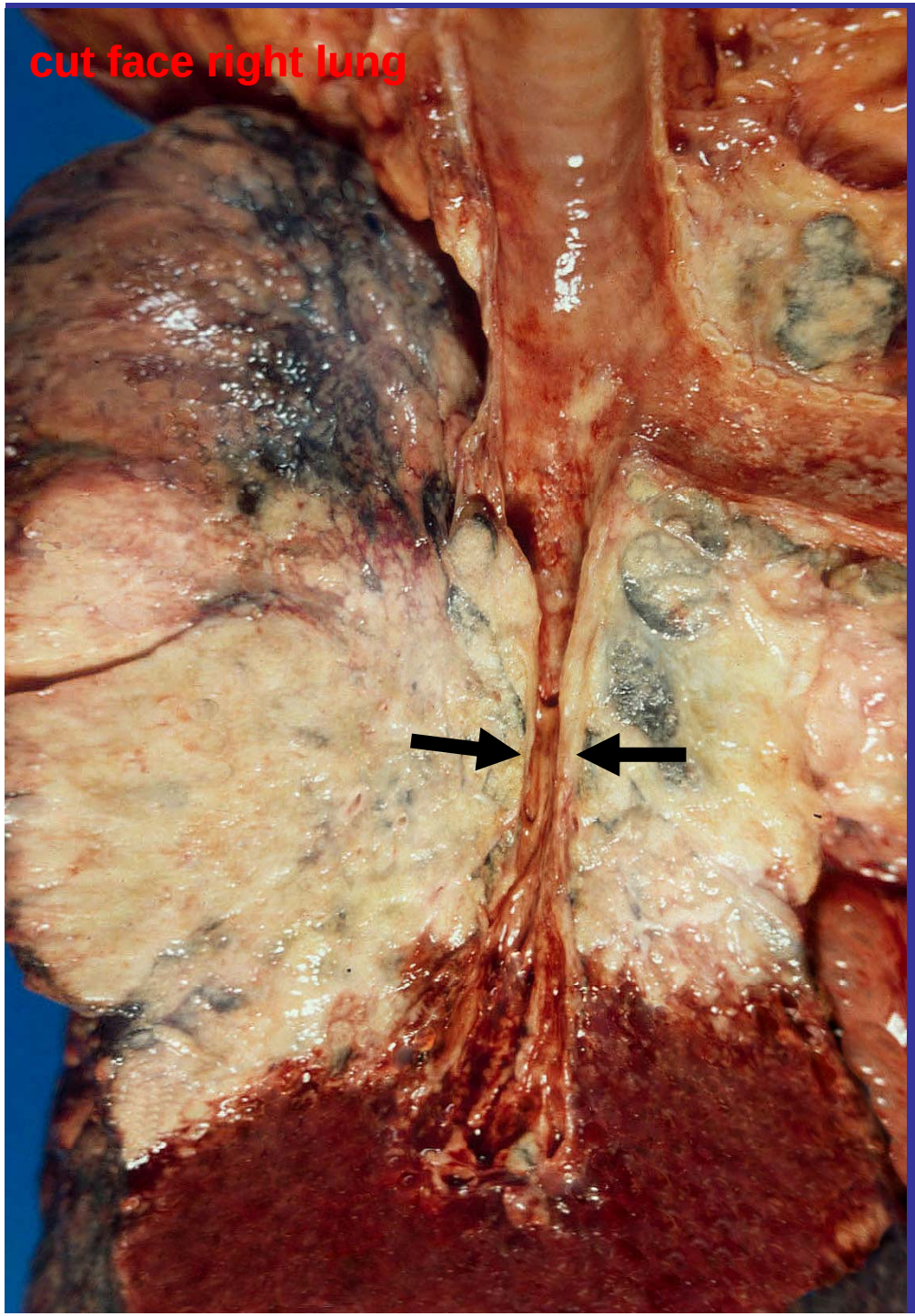

systemic complications of the lung cancer
form
color
steric
spreading
false
false
false
false
reticular
white
multinodular
cavitary
cavitary metastasis



color pattern

of the lesion

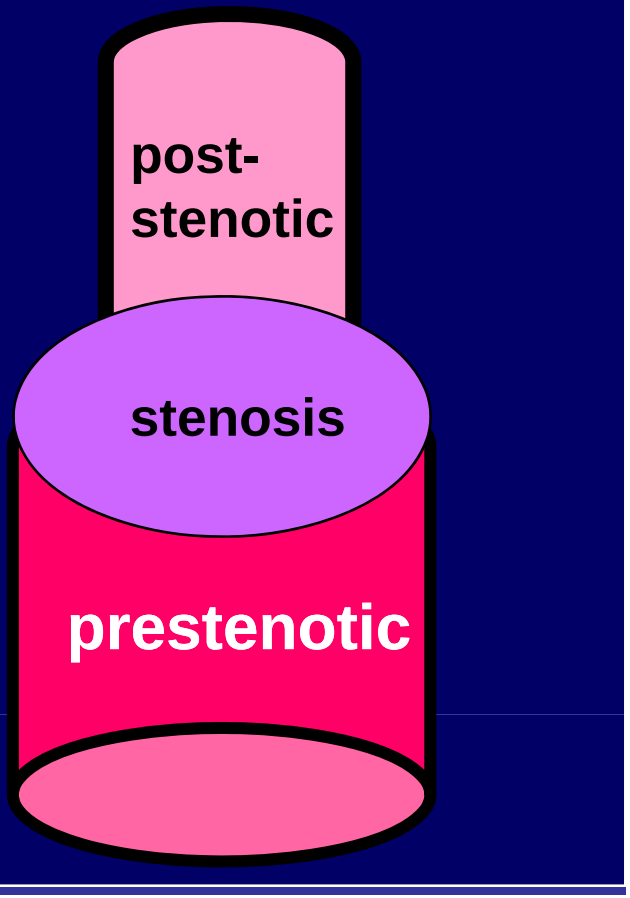
- bright red > bleeding
- wine red > porphyria
- yellow red > pheomelanin
- dark-red > cyanosis

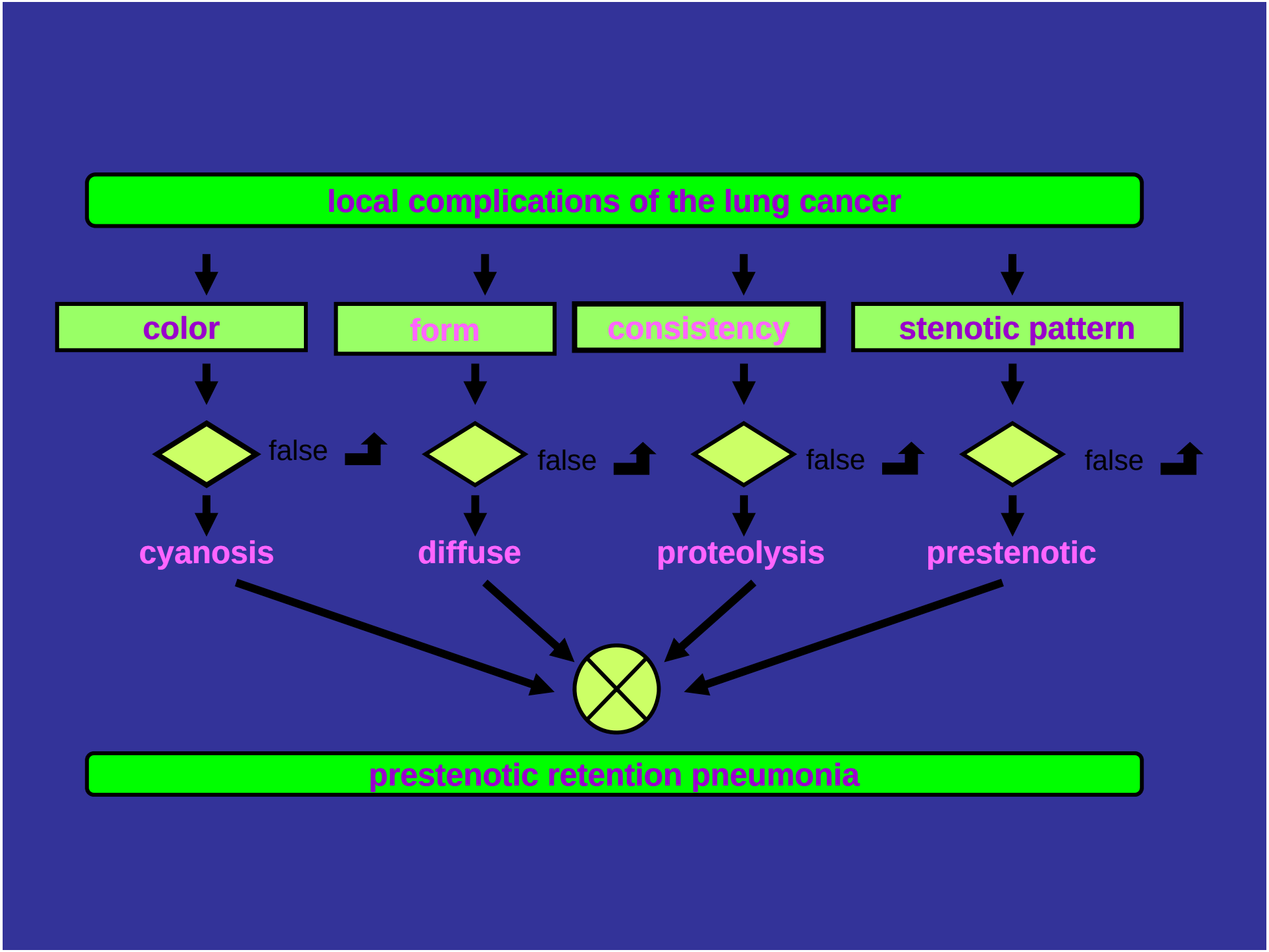


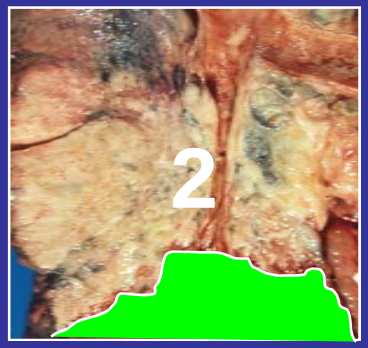
stenotic pattern

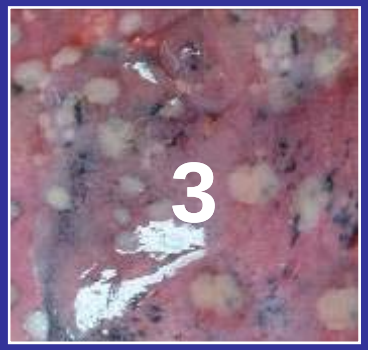
complications of the lesion

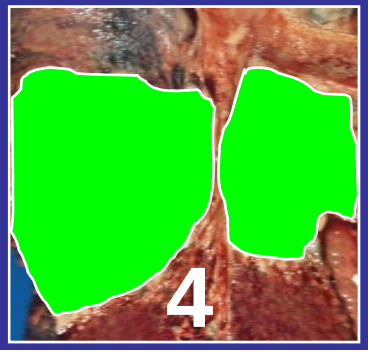
- poststenotic atrophy
- poststenotic dysfunction
- prestenotic hyperplasia
- prestenotic retention




local complications of the lung cancer
color
form
consistency
stenotic pattern
false
false
false
false
cyanosis
diffuse
proteolysis
prestenotic
prestenotic retention pneumonia







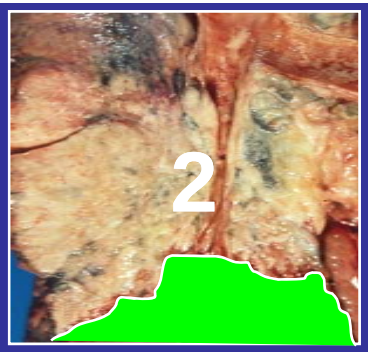
pathogenetic sequence

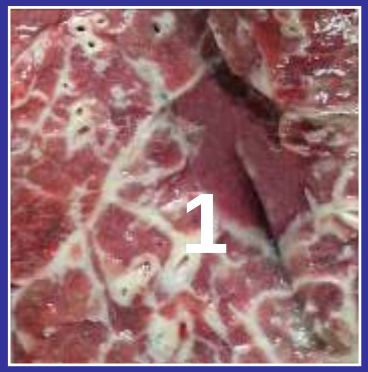
of the lesions

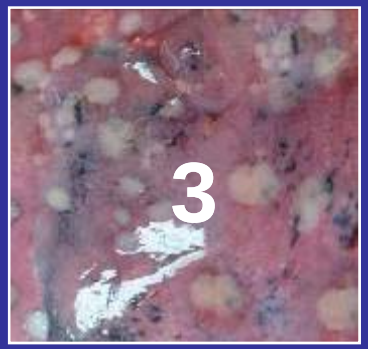
1 > 2 > 3 > 4

3 > 2 > 1 > 4

4 > 1 > 3 > 2







pathogenetic sequence
of the lesions

1 > 2 > 3 > 4

3 > 2 > 1 > 4

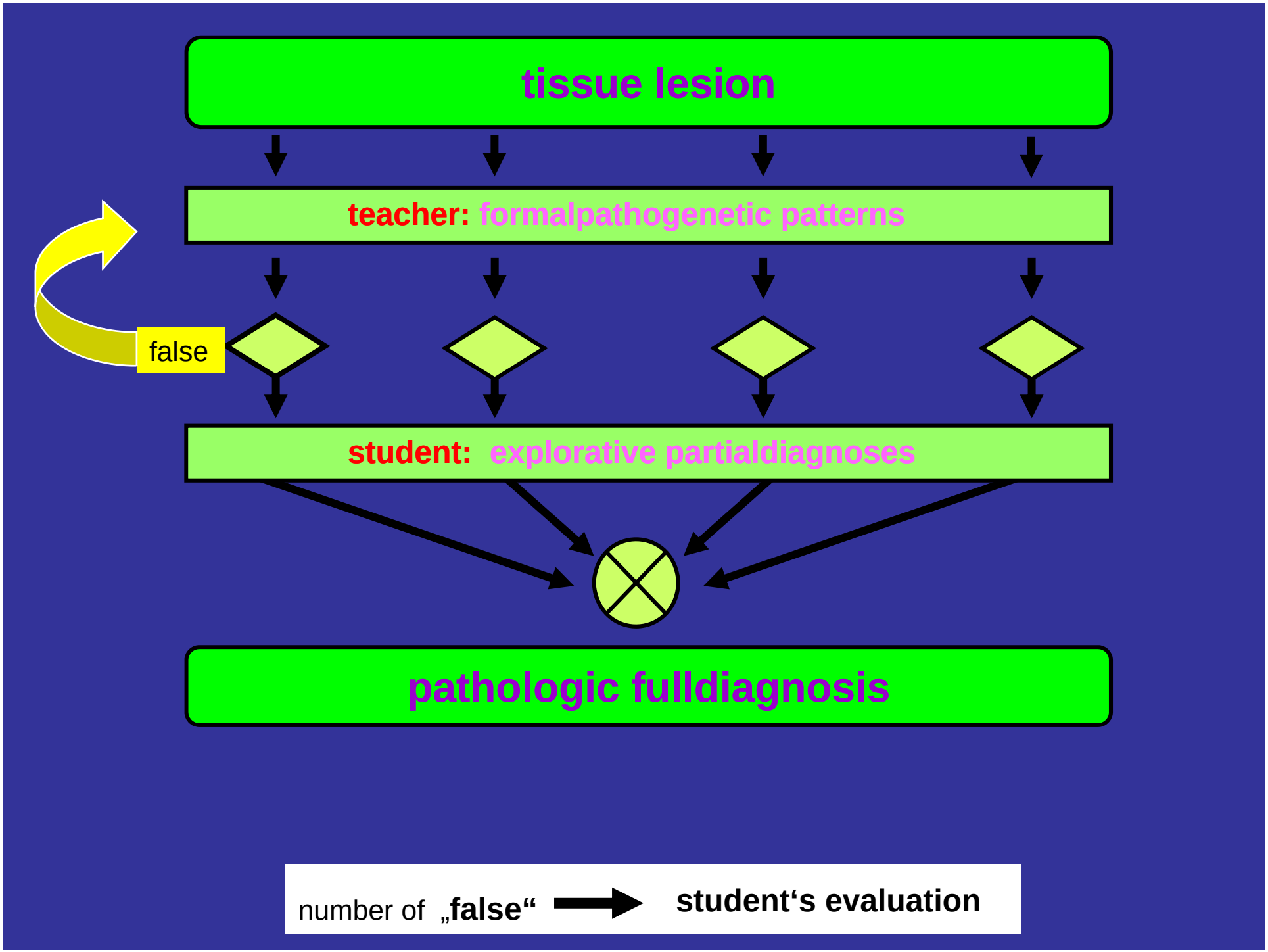
4 > 1 > 3 > 2

2 > 4 > 1 > 3

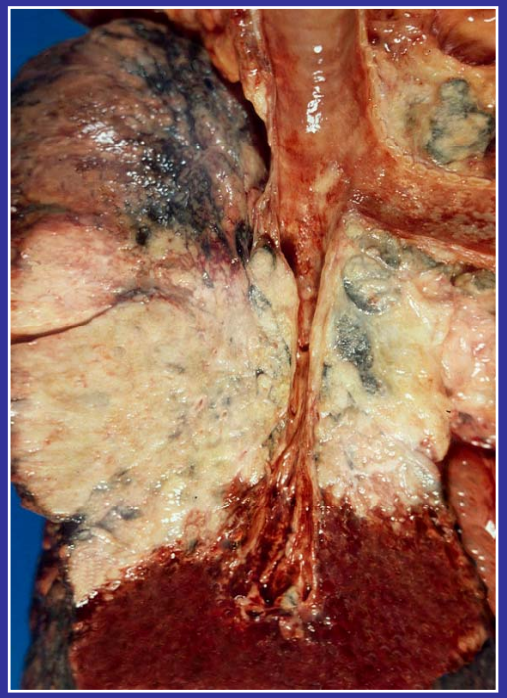
false

back to theory

evaluation of student


tissue lesion
teacher: formalpathogenetic patterns
false
student: explorative partialdiagnoses
pathologic fulldiagnosis
number of „false“
student‘s evaluation

primary lesion



secondary lesion

expansion: macrofocal
> primary lesion

color: white
> tumor

contour: fuzzy
> malignoma

stenosis: prestenotic
> secondary lesion
> mucus retention

color: cyanosis
> no oxygenation

consistency: pulpy
> inflammatory proteolysis