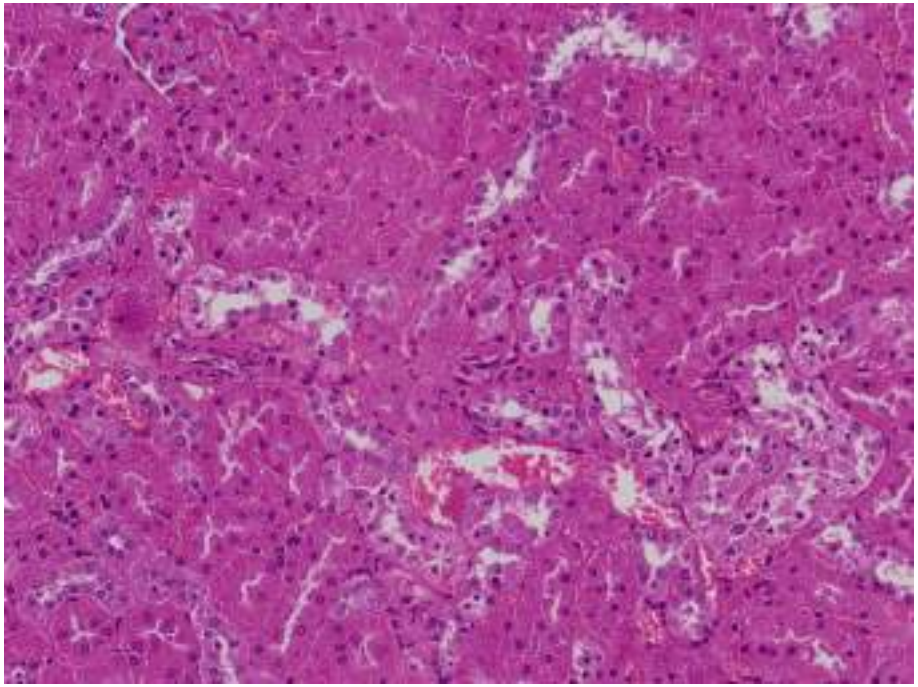
POST-MORTEM MICROSCOPIC CHANGES IN SELECTED RAT TISSUES:

BETRAYERS OF FORENSIC, TOXICOLOGIC AND DIAGNOSTIC PATHOLOGISTS

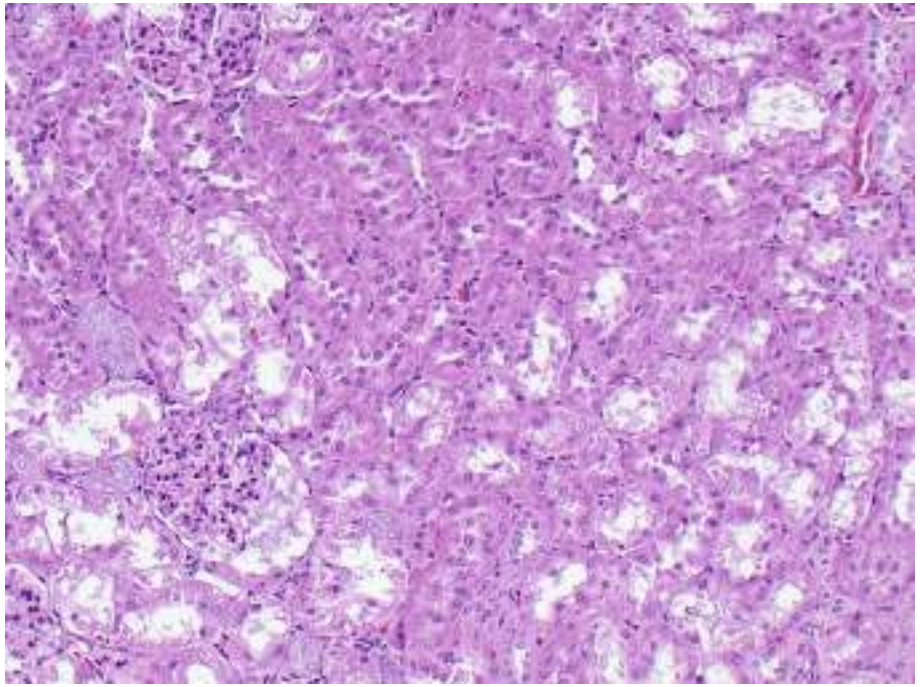
K. Weber, R. de Miguel, A. Domènech, R. Kreutzer, F.J. Mayoral, P. Ortega, Y. Okazaki,

L. Polledo, T. Razinger, O. Richard, R. Sánchez

Post-mortem Alteration or Real Lesions?



AUTOLYSIS (4h) in Distal Convoluted Tubules



NECROSIS in Proximal Convoluted Tubules

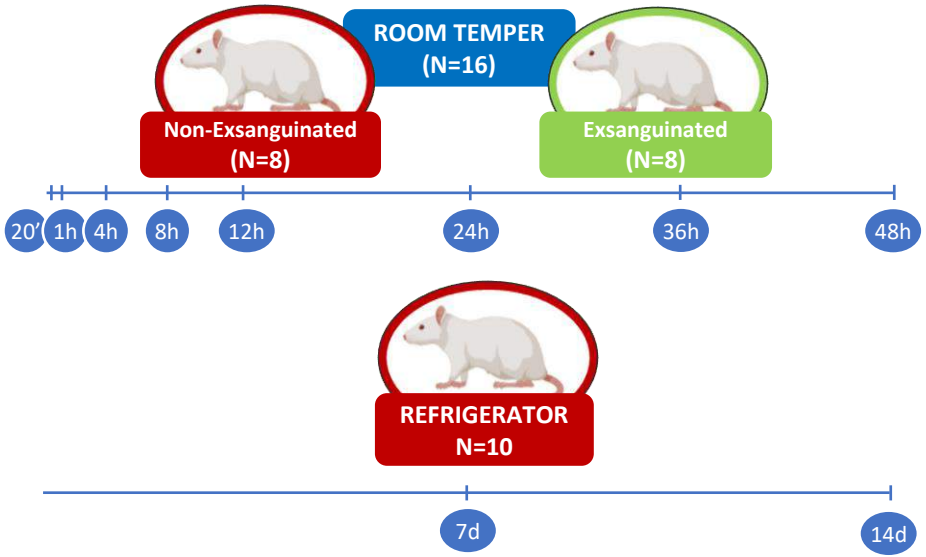
AIM

TO DESCRIBE THE MICROSCOPIC CHANGES IN RAT TISSUES AFTER DELAYED POSTMORTEM FIXATION

TO ANALYZE THE IMPACT OF EXSANGUINATION AND COOLING

MATERIAL & METHODS

ANIMALS: Wistar Han Rats



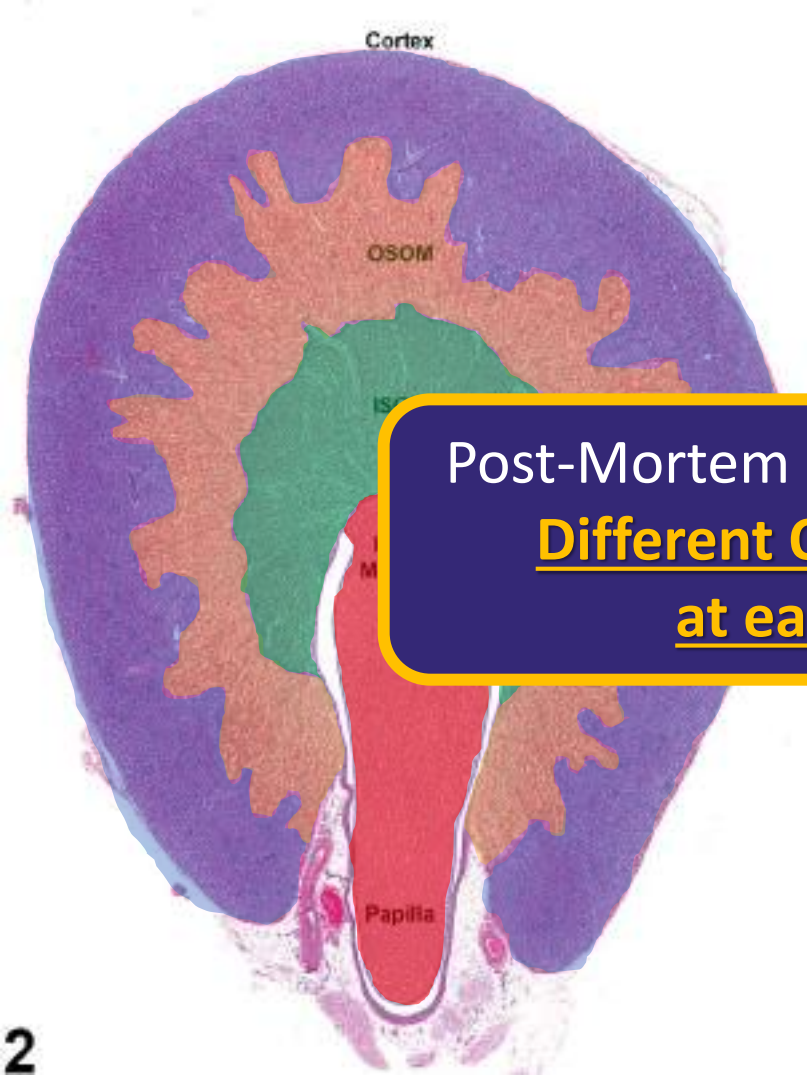
TISSUES

- KIDNEYS
- LIVER
- DIGESTIVE SYSTEM

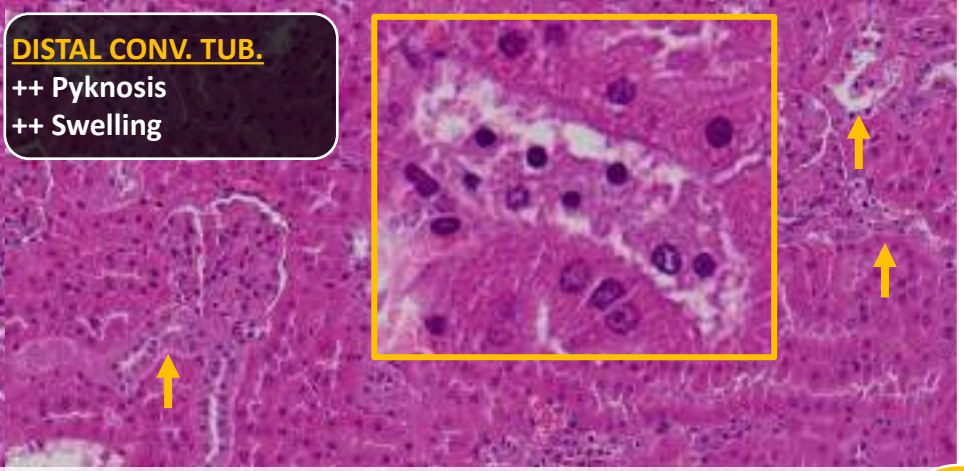
→ H&E Stain + Digital Scan

HISTOLOGICAL EVALUATION (Digital Slides)

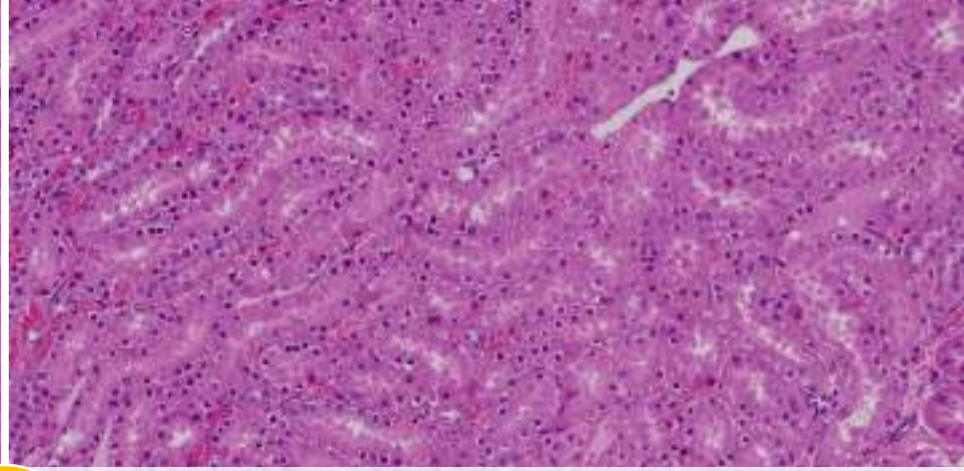
KIDNEYS



Post-Mortem alterations in Rat Kidneys:
Different Onset and Progression at each compartment

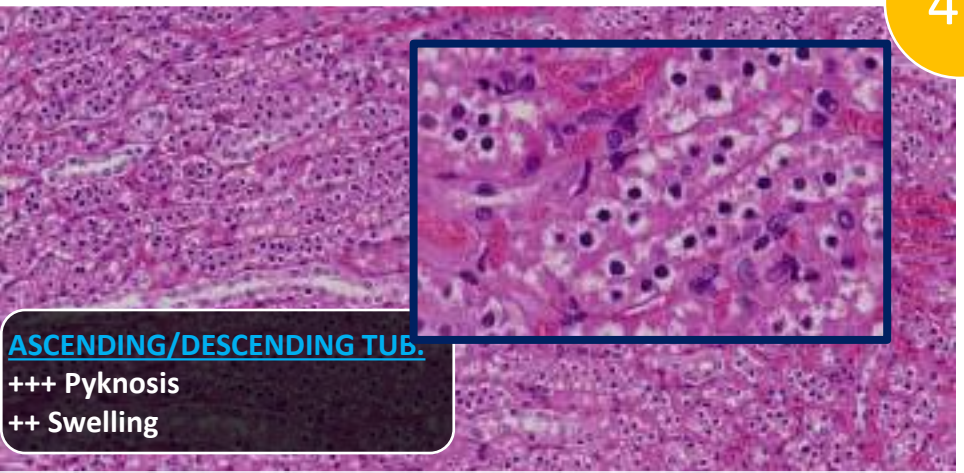


CORTEX

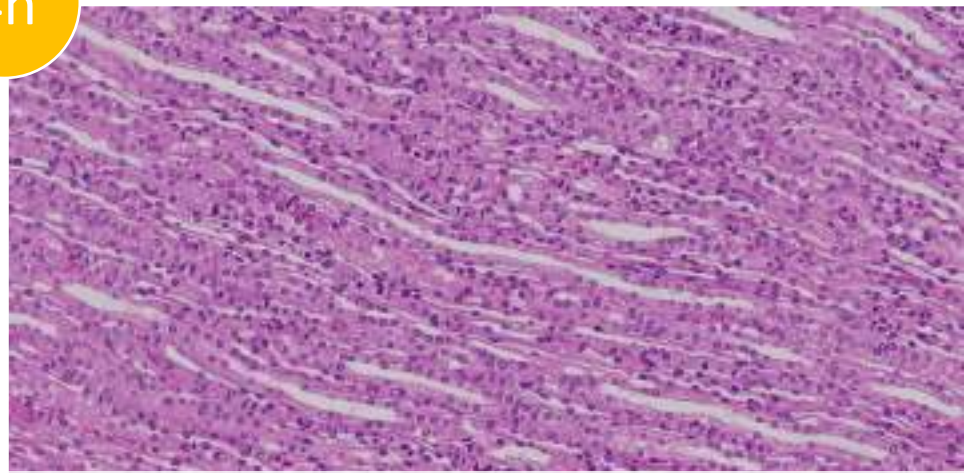


OUTER STRIPE – OUTER MEDULLA

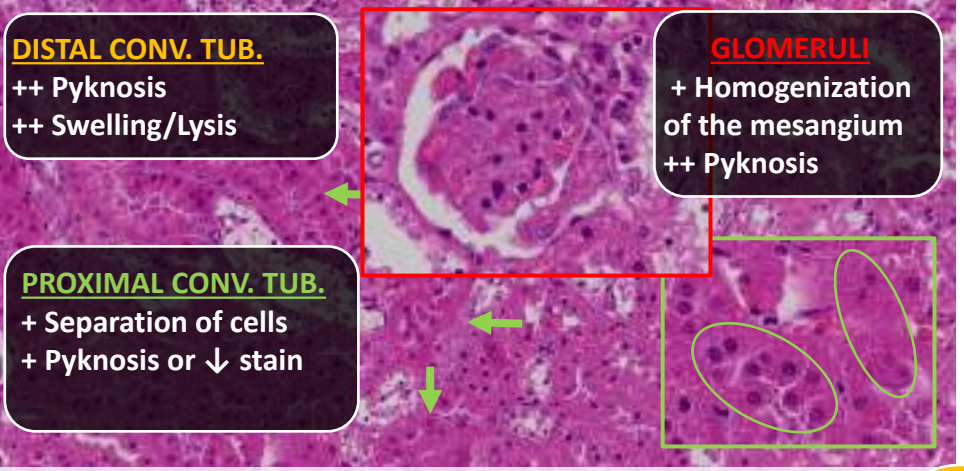
4h



INNER STRIPE – OUTER MEDULLA



INNER MEDULLA



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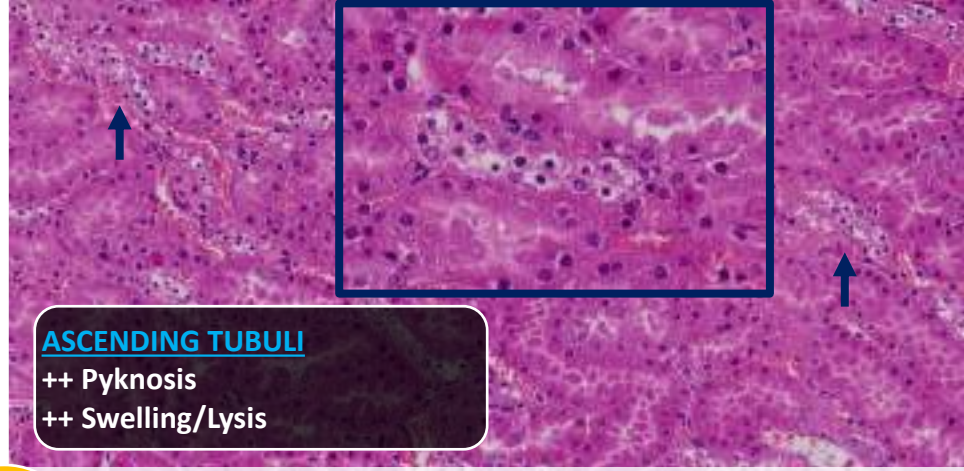
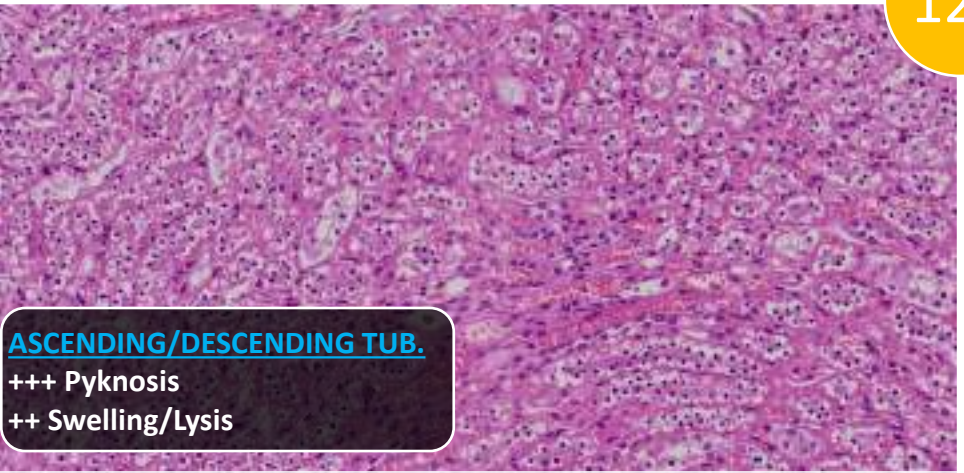
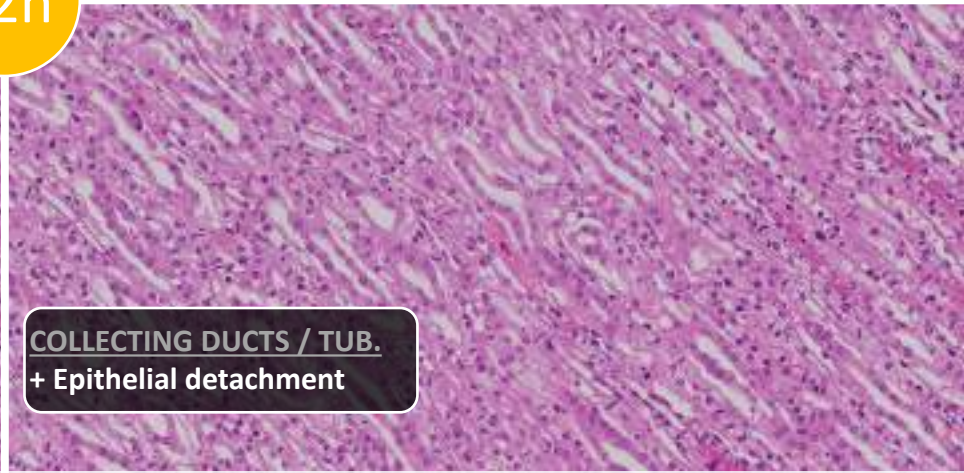


OUTER STRIPE – OUTER MEDULLA

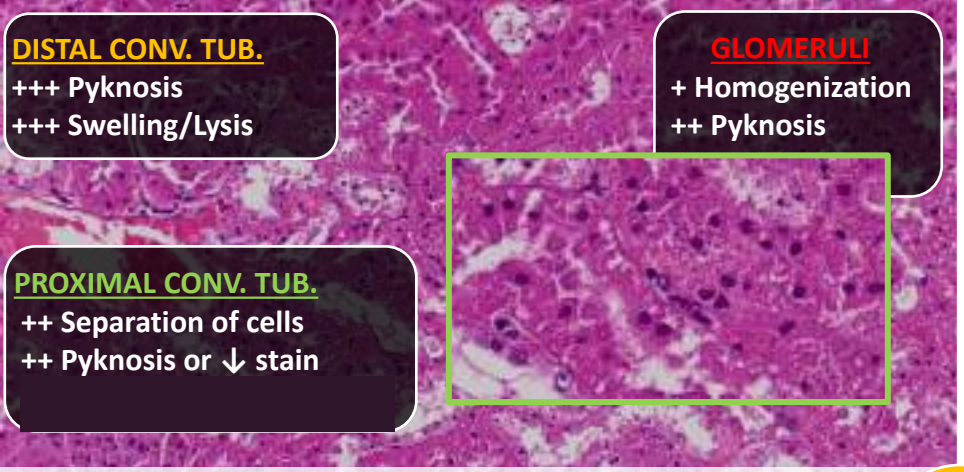
12h



INNER STRIPE – OUTER MEDULLA



INNER MEDULLA



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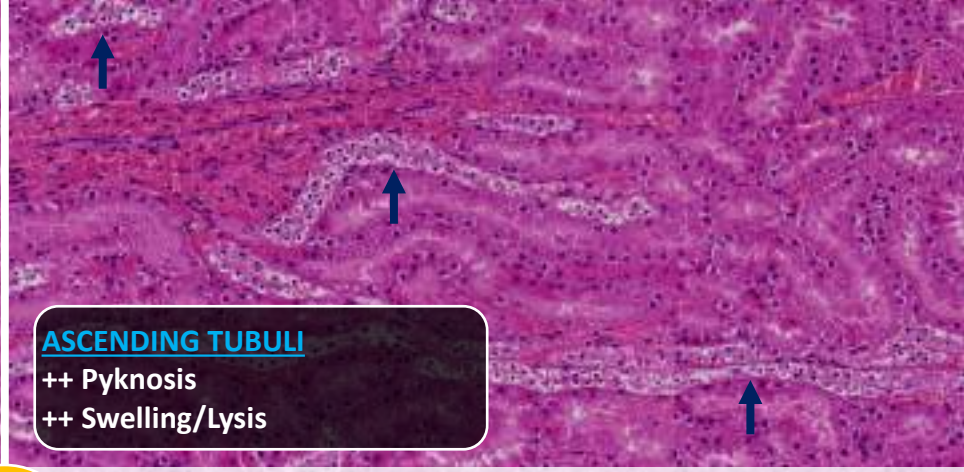
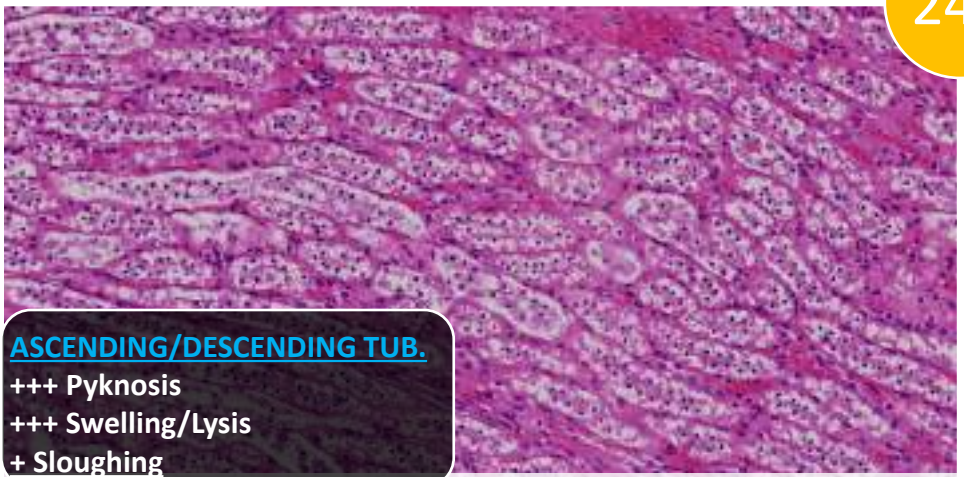
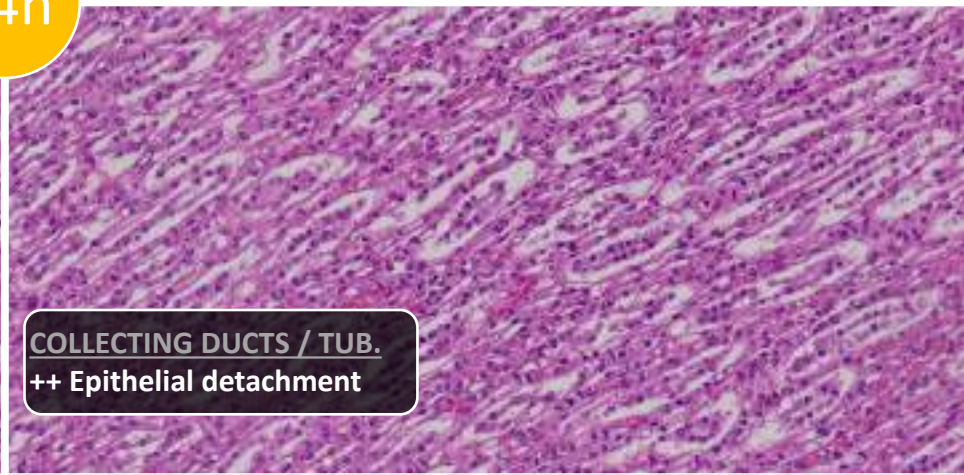


OUTER STRIPE – OUTER MEDULLA

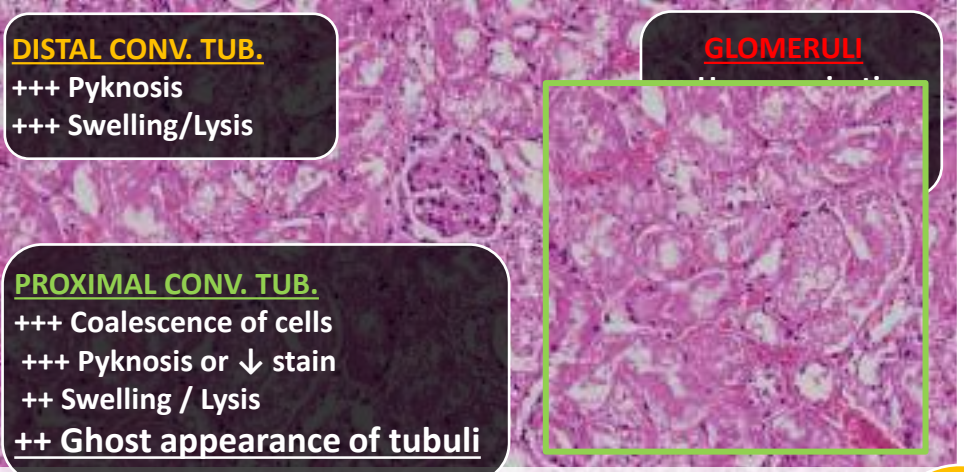
24h



INNER STRIPE – OUTER MEDULLA



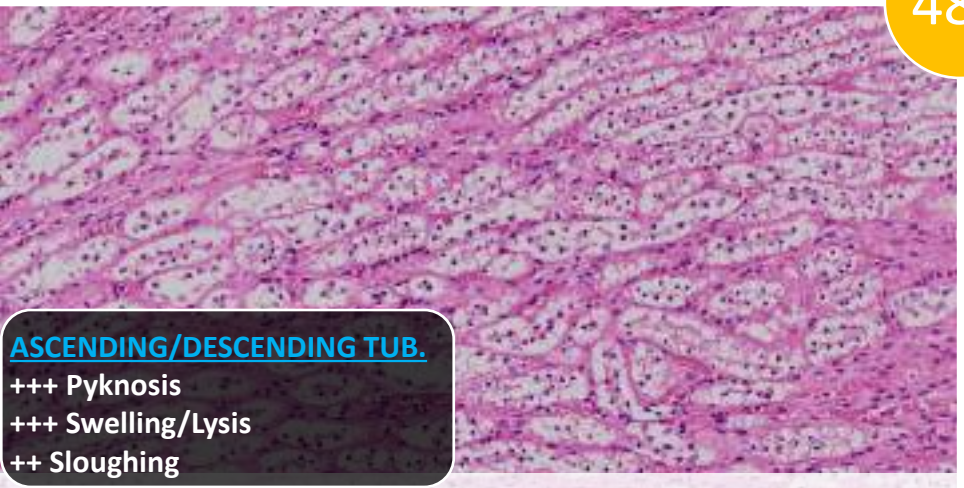
INNER MEDULLA



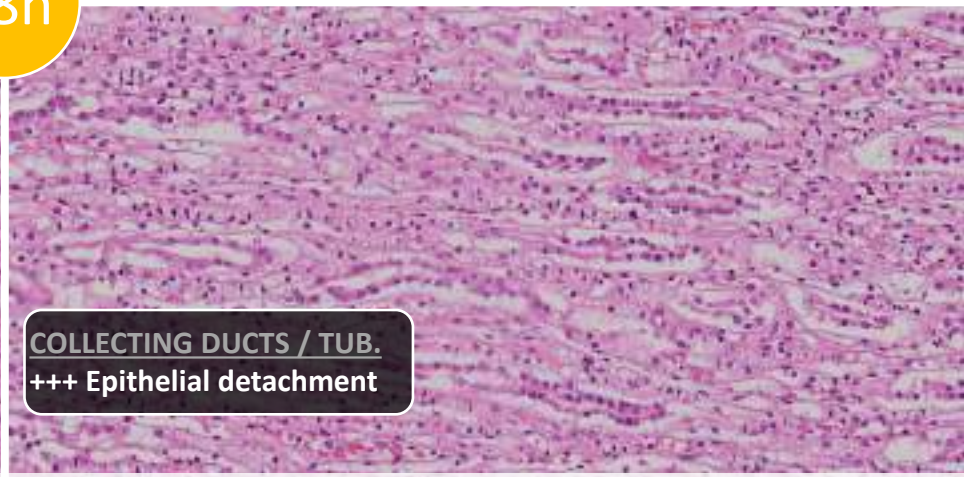
CORTEX

OUTER STRIPE – OUTER MEDULLA

48h



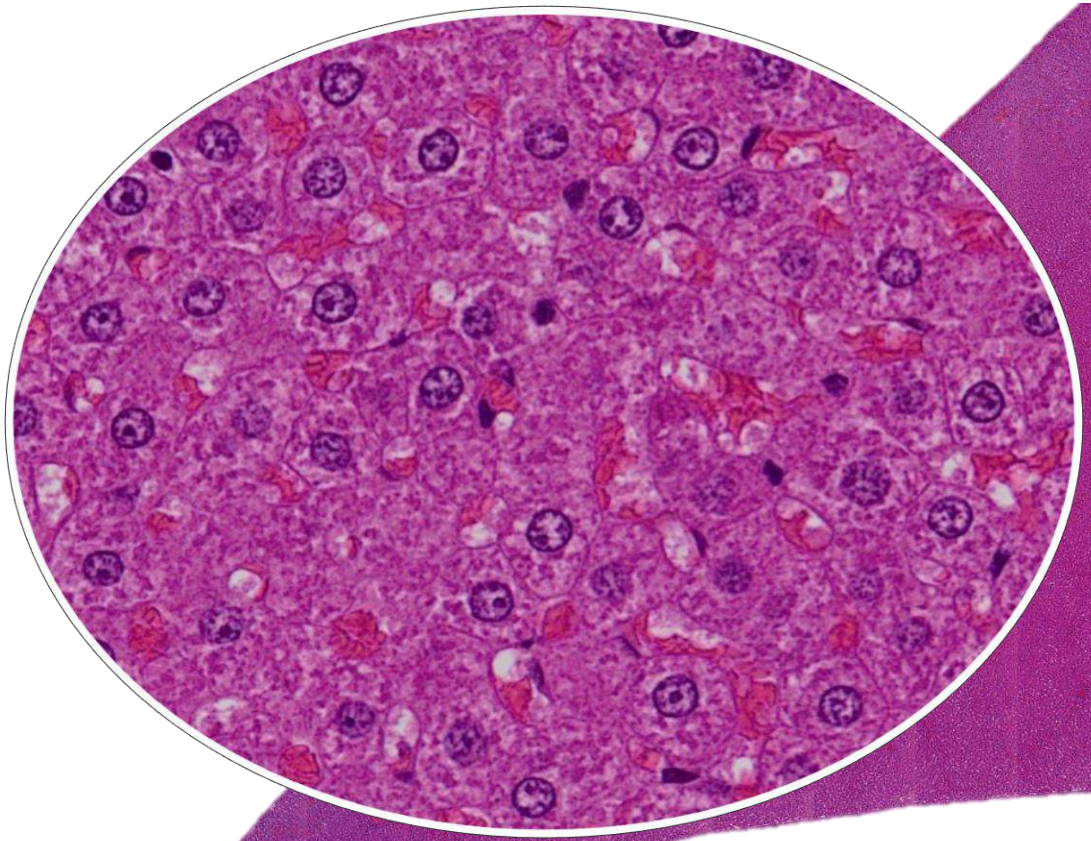
INNER STRIPE – OUTER MEDULLA



INNER MEDULLA


INNER STRIPE –
OUTER MEDULLA
OUTER STRIPE –
OUTER MEDULLA
CORTEX

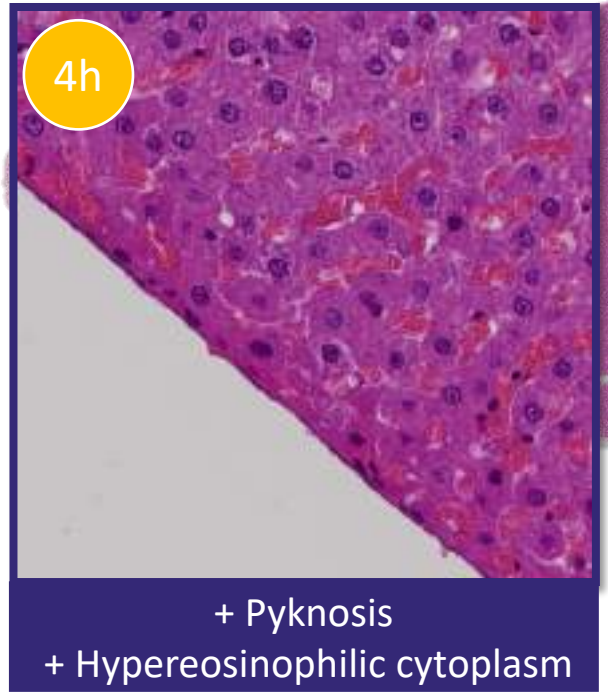
LIVER

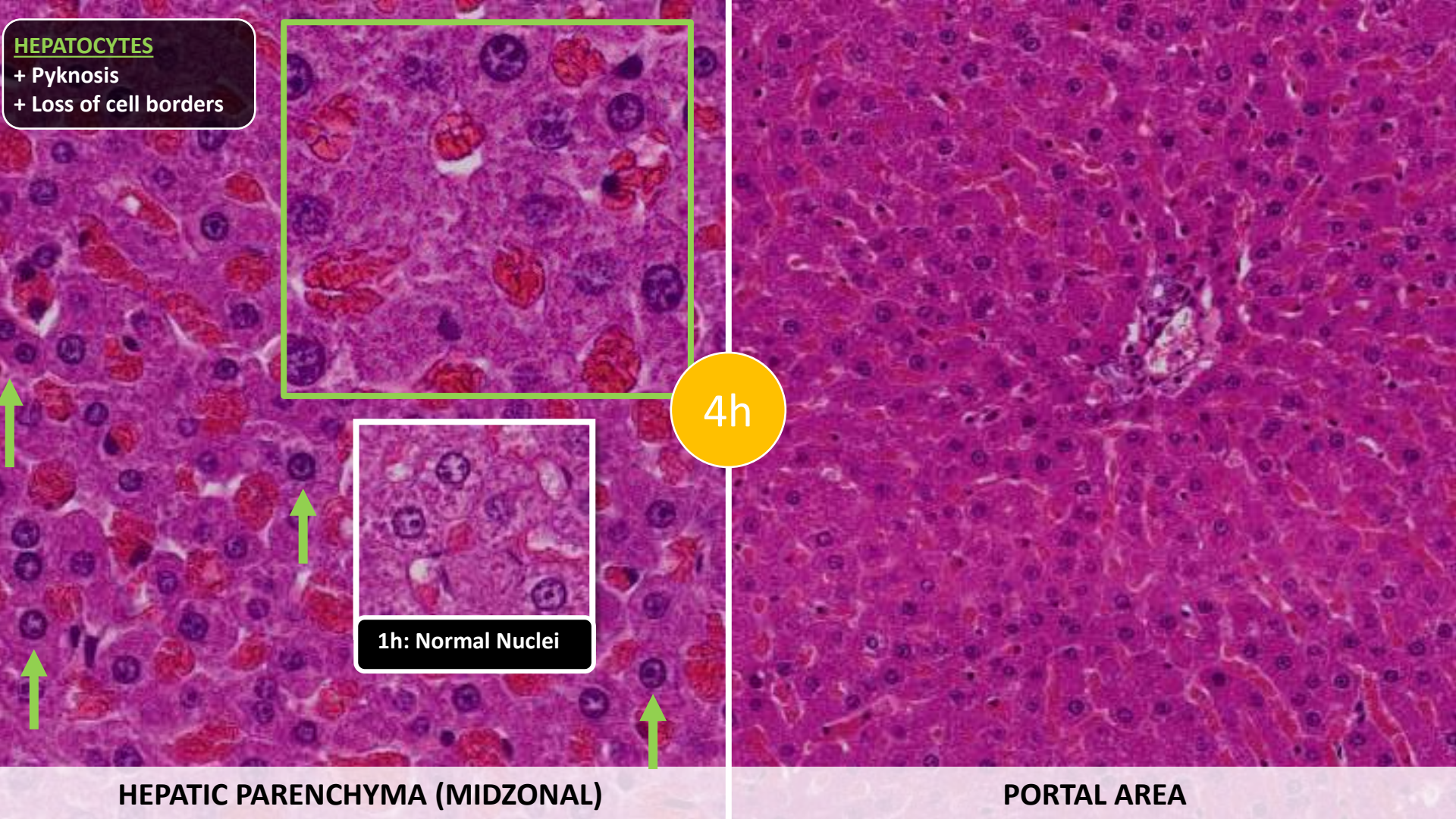


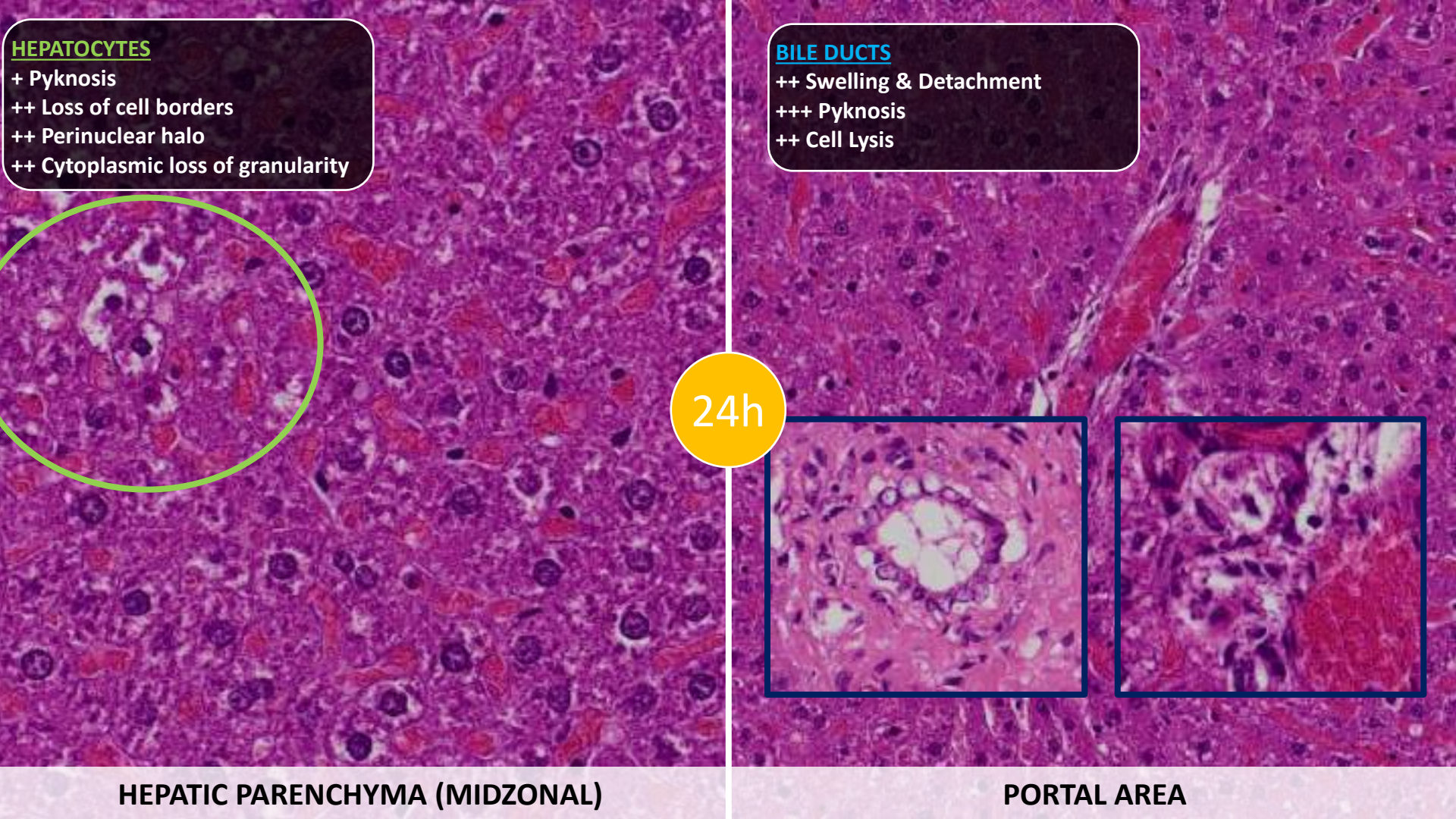
The amount of **glycogen and fat** within hepatocytes could be playing an **unknown role** in post-mortem alterations

LIVER

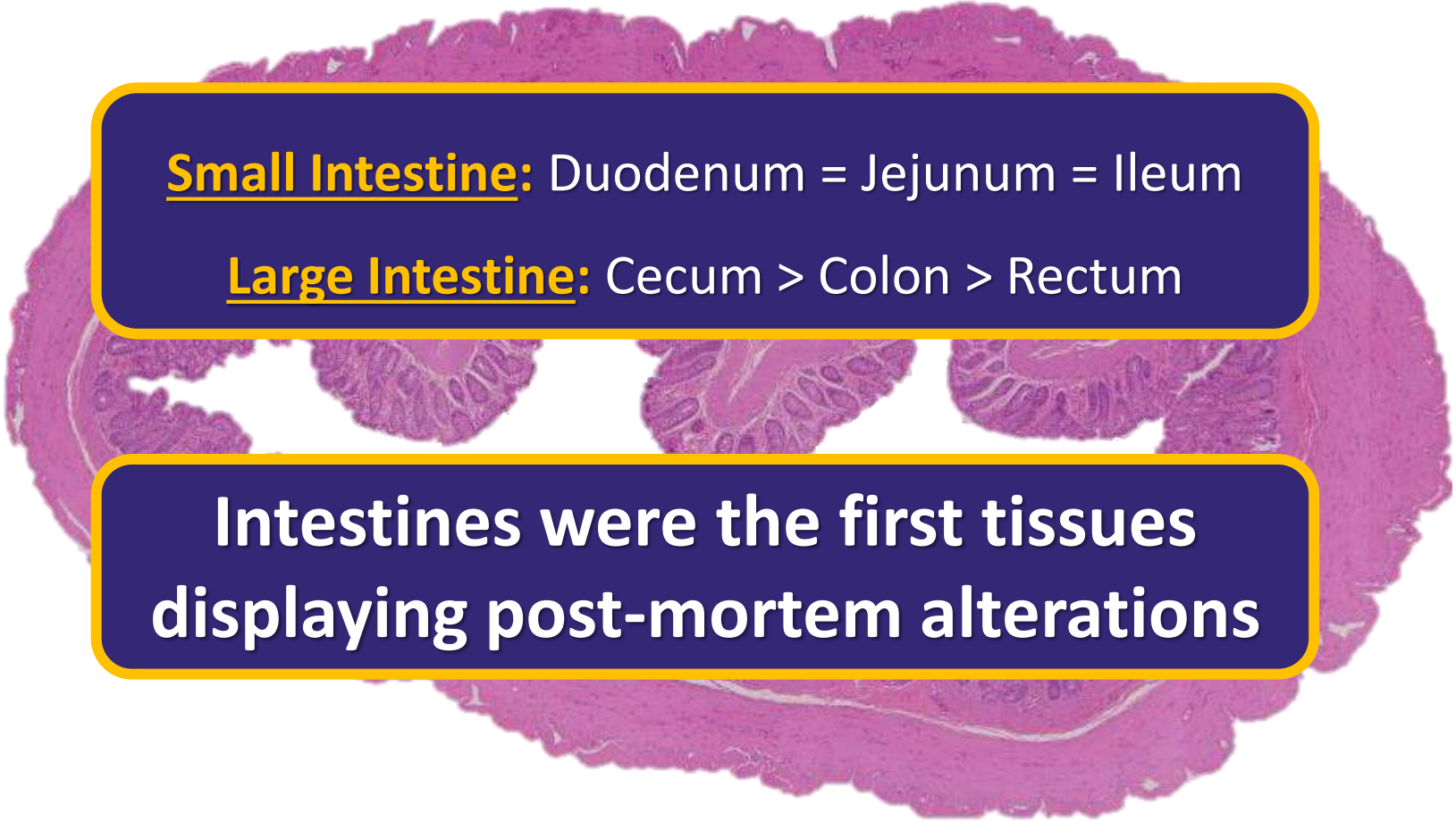
Visceral Surface was more affected
by post-mortem alterations than Diaphragmatic surface




HEPATOCYTES
+ Pyknosis
+ Loss of cell borders
4h
1h: Normal Nuclei
HEPATIC PARENCHYMA (MIDZONAL)
PORTAL AREA


HEPATOCYTES
+ Pyknosis
++ Loss of cell borders
++ Perinuclear halo
++ Cytoplasmic loss of granularity
BILE DUCTS
++ Swelling & Detachment
+++ Pyknosis
++ Cell Lysis
24h
HEPATIC PARENCHYMA (MIDZONAL)
PORTAL AREA

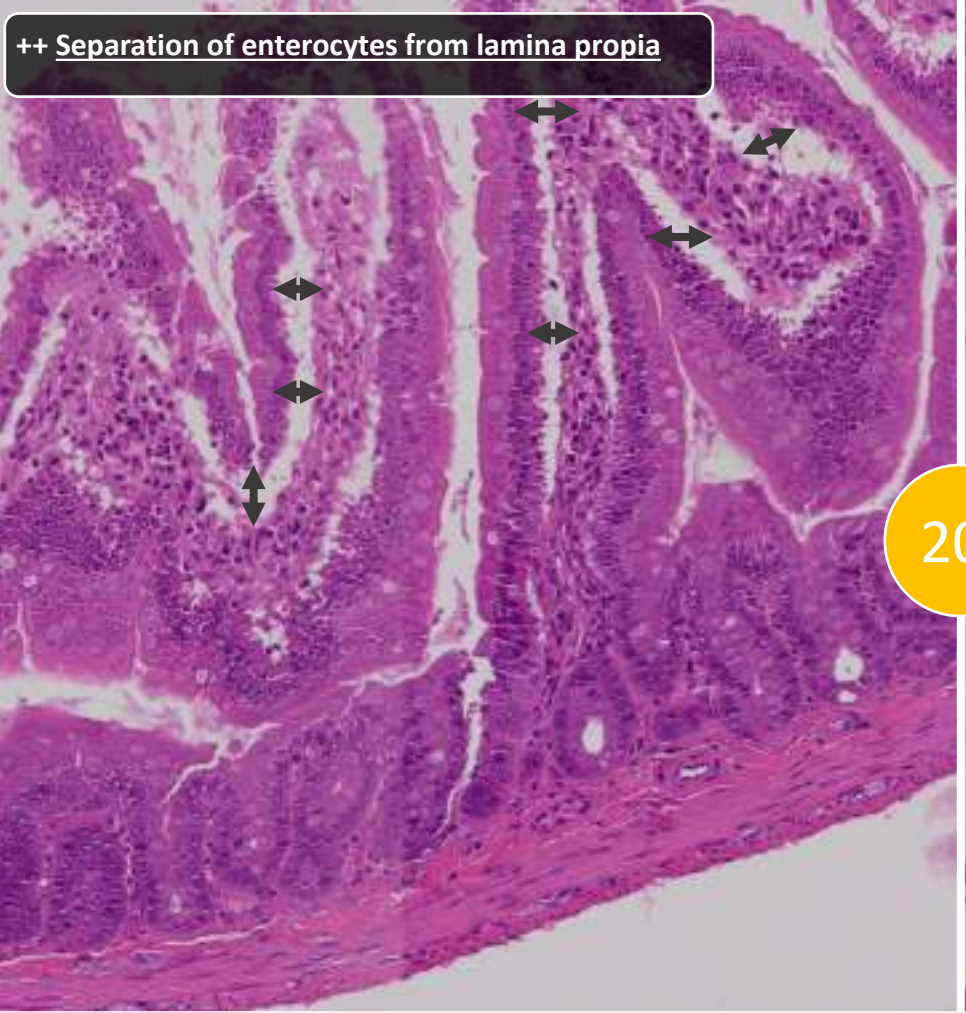
SMALL & LARGE INTESTINE

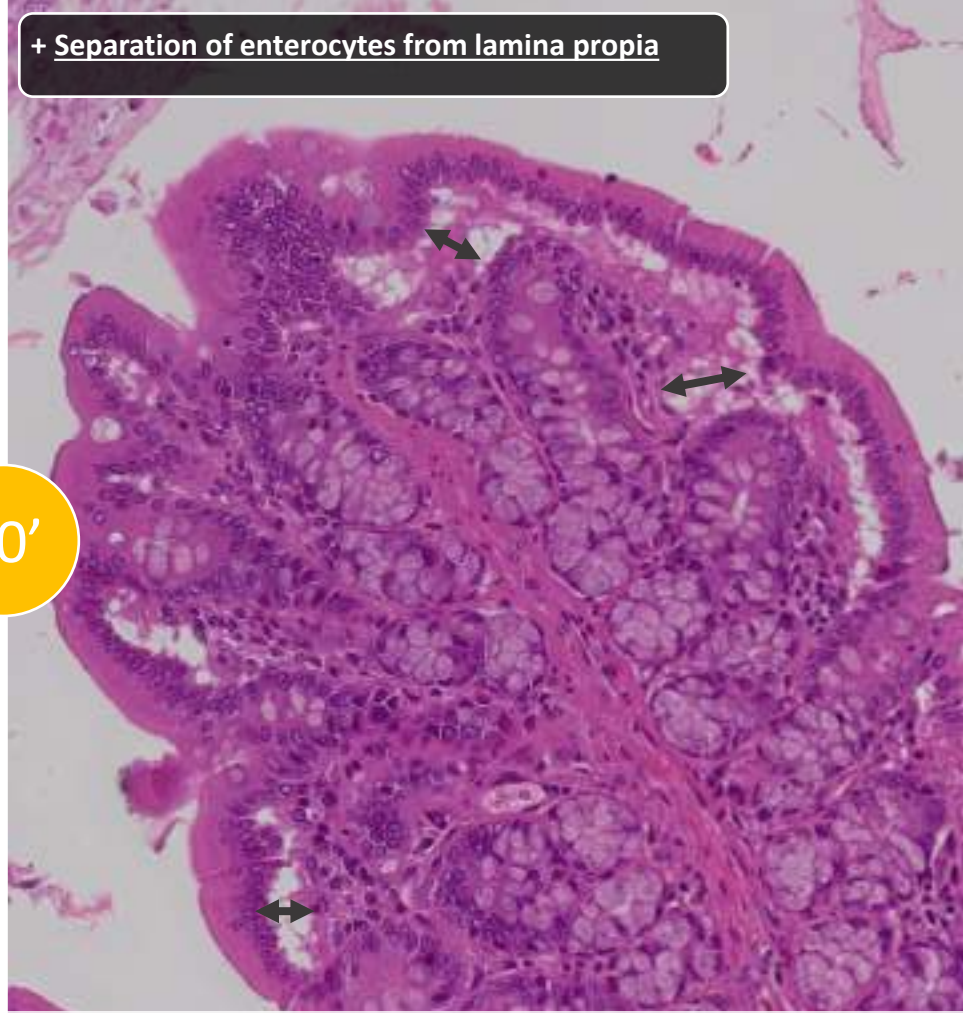


Small Intestine: Duodenum = Jejunum = Ileum

Large Intestine: Cecum > Colon > Rectum

Intestines were the first tissues displaying post-mortem alterations

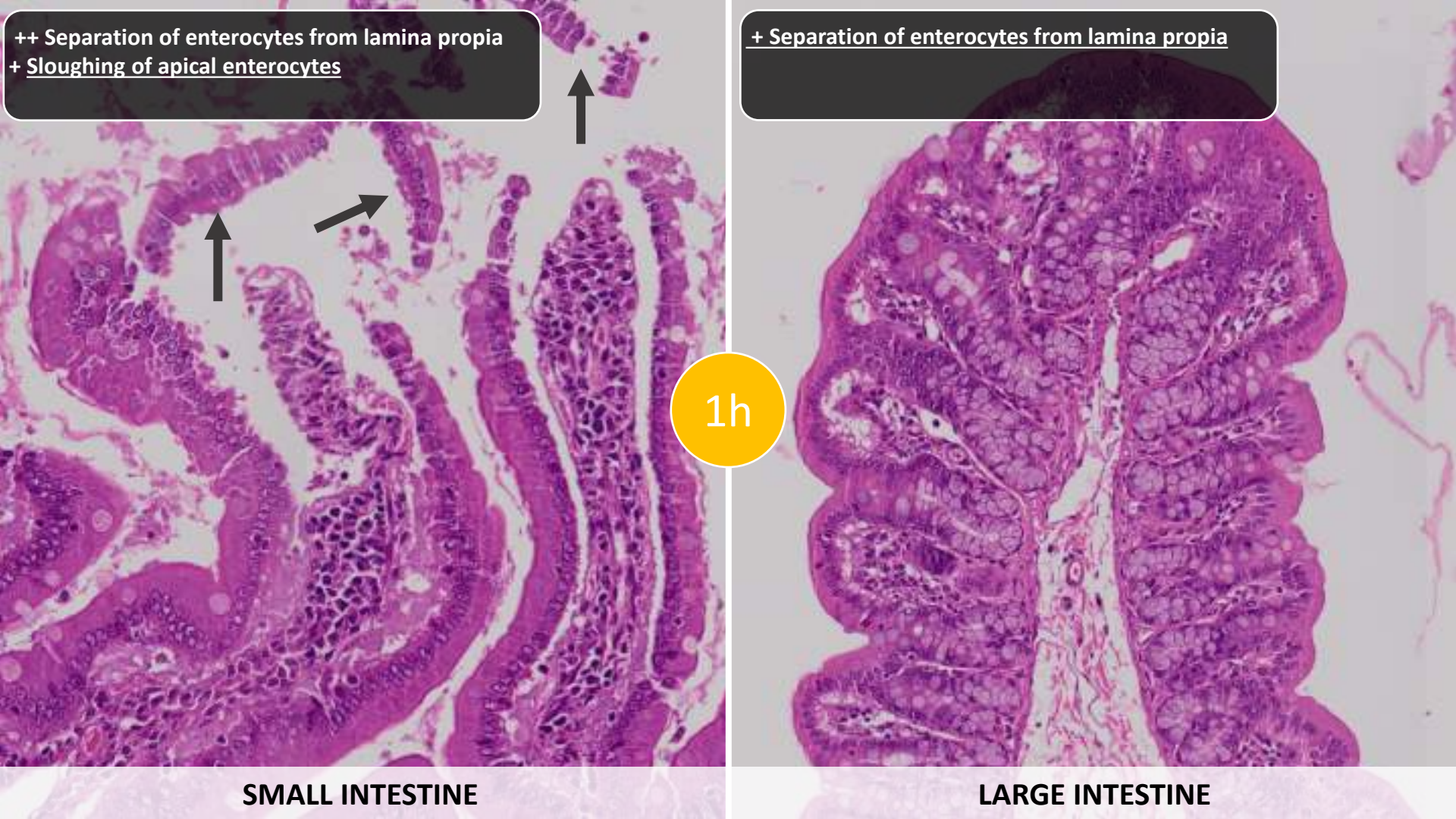




20’

SMALL INTESTINE

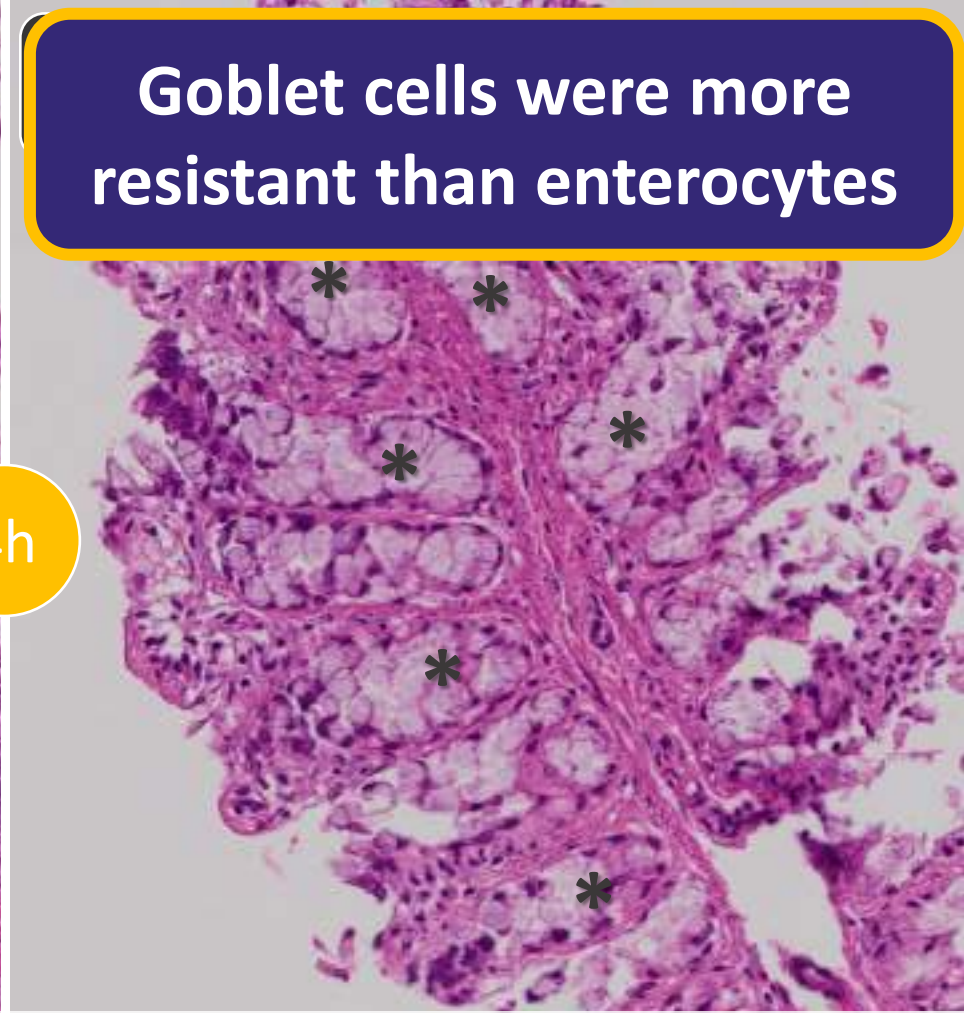
LARGE INTESTINE


++ Separation of enterocytes from lamina propia
+ Sloughing of apical enterocytes
+ Separation of enterocytes from lamina propia
1h
SMALL INTESTINE
LARGE INTESTINE

Crypts were more resistant than villi

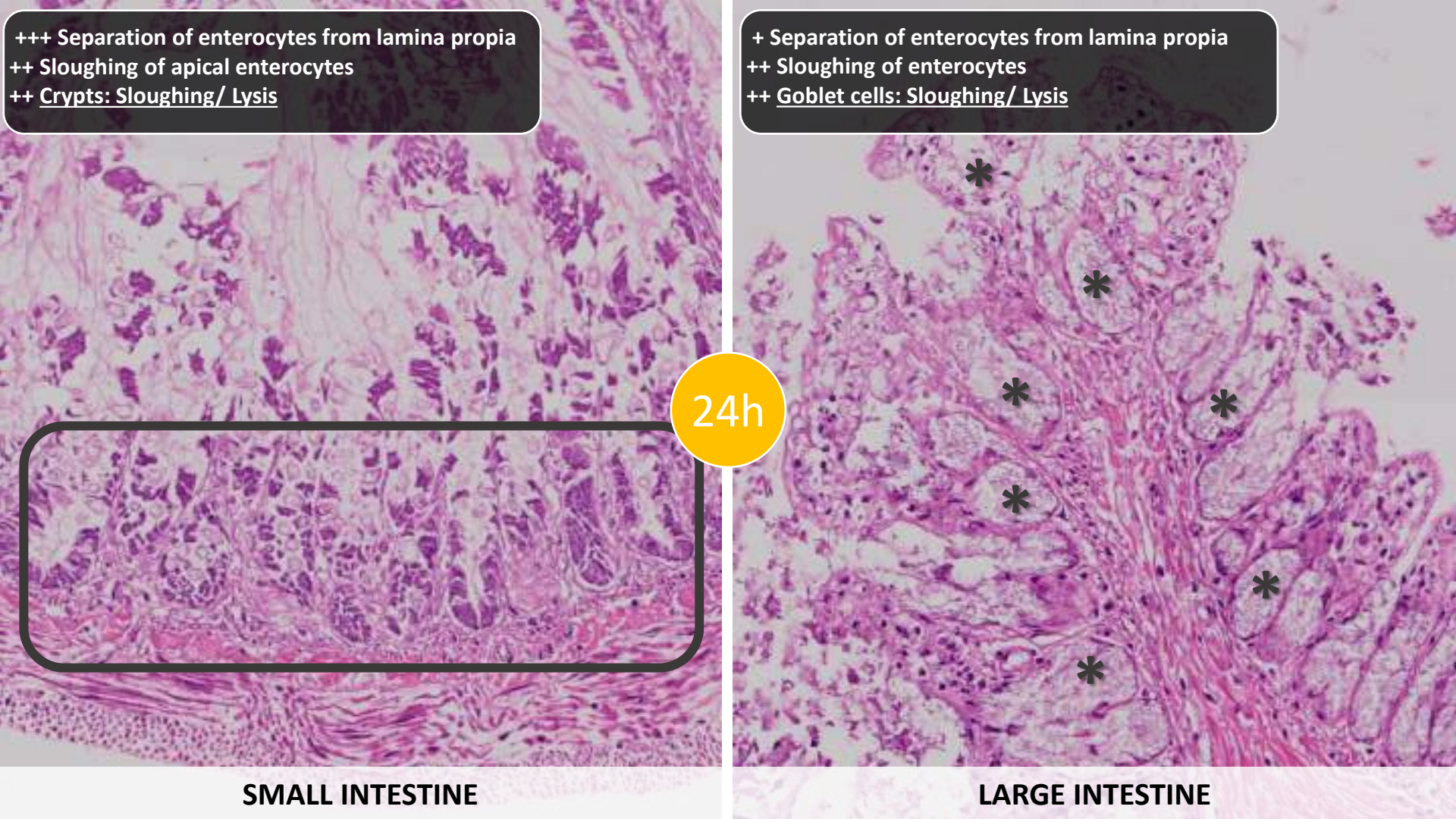
Goblet cells were more resistant than enterocytes

4h



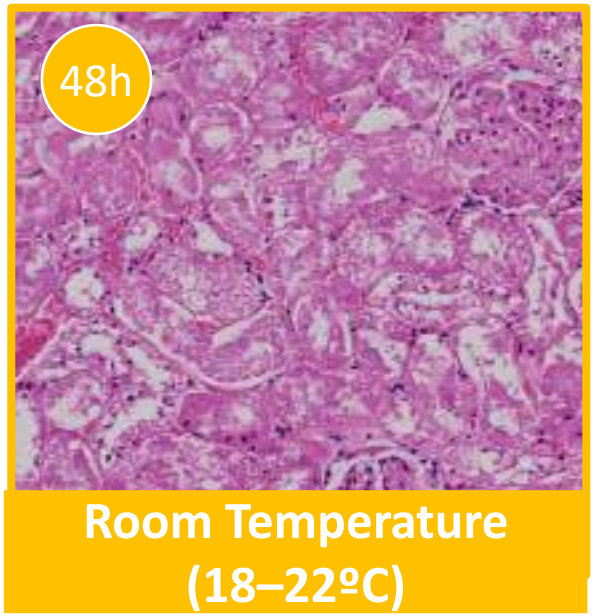
SMALL INTESTINE

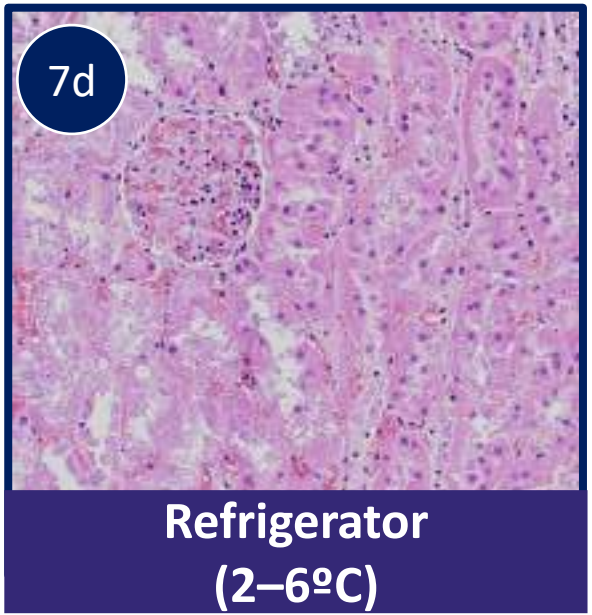
LARGE INTESTINE

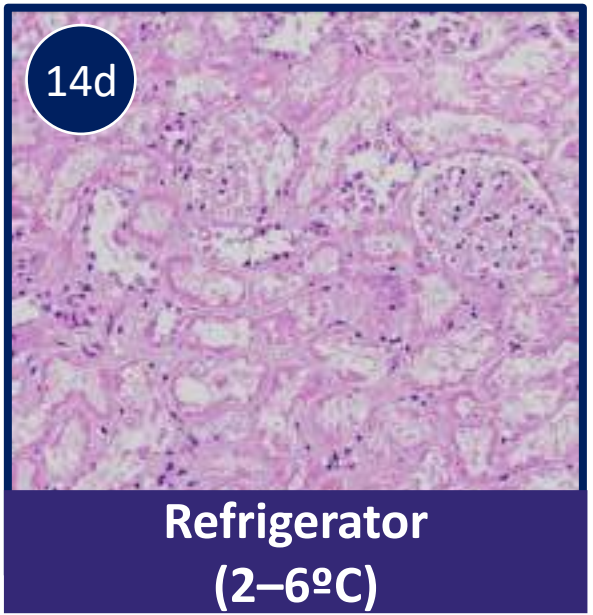

+++ Separation of enterocytes from lamina propia
++ Sloughing of apical enterocytes
++ Crypts: Sloughing/ Lysis
24h
+ Separation of enterocytes from lamina propia
++ Sloughing of enterocytes
++ Goblet cells: Sloughing/ Lysis
SMALL INTESTINE
LARGE INTESTINE

Cooling Of Animals After Death

	COOLING EFFECT
Kidneys	Slow Down
Liver	Slow Down
Intestines	Slow Down

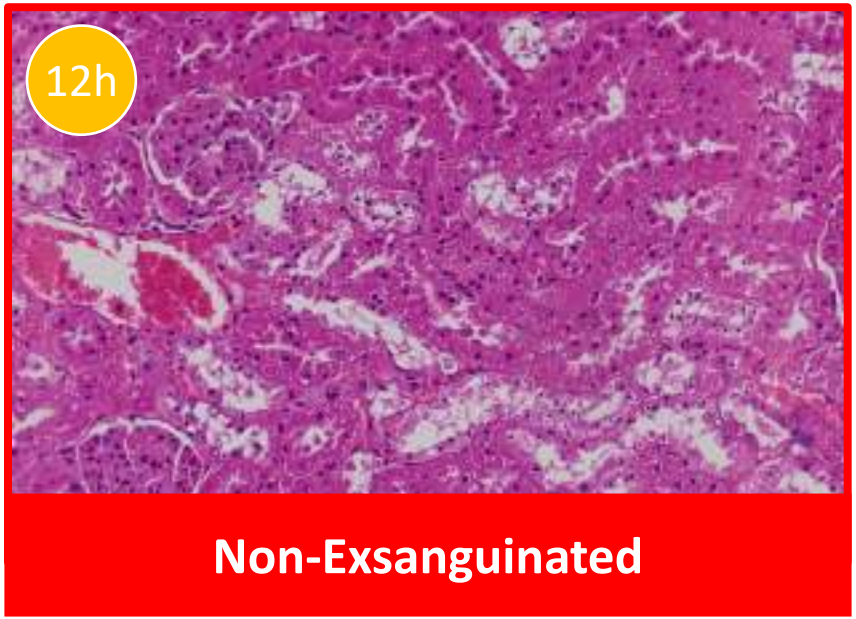


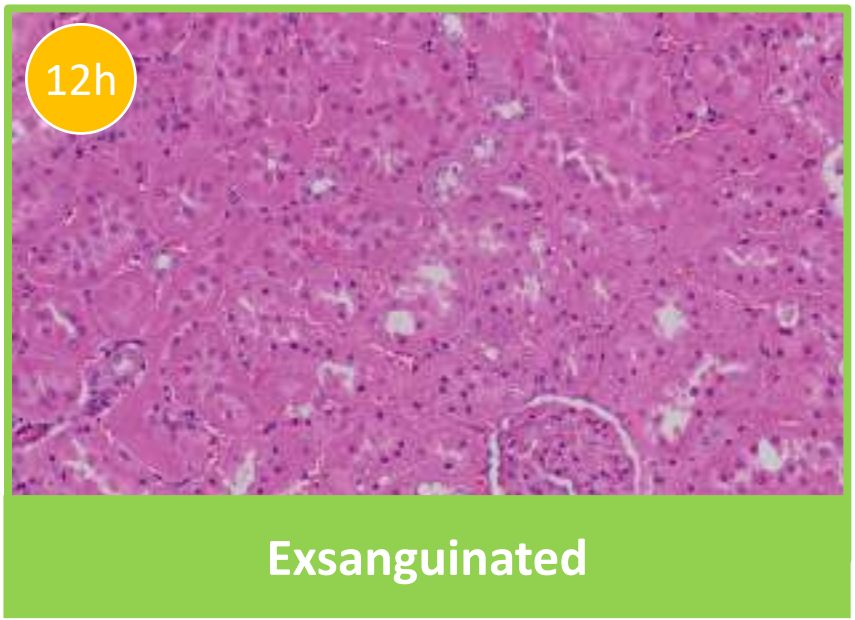




Exsanguination Of Animals After Death

	COOLING EFFECT	EXHANGUINATION
Kidneys	Slow Down	Slow Down
Liver	Slow Down	Slow Down
Intestines	Slow Down	No Effect





CONCLUSIONS

1. Post-mortem microscopic changes in rat tissues are **specific, recognizable, progressive and evolve over time**

2. The onset and progression of post-mortem microscopic changes in rat tissues can **differ among organs and among areas of the same organ**

3. **Exsanguination and cooling may slow down the progression** of post-mortem microscopic changes in rat tissues

4. **A global interpretation** of all organ findings and its comparison with other organs is needed to **ease the differentiation between post-mortem changes and real lesions**

THANK YOU!

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