# PYOGRANULOMATOUS PLEUROPNEUMONIA AND MEDIASTINITIS IN FERRETS ASSOCIATED WITH *Pseudomonas luteola*

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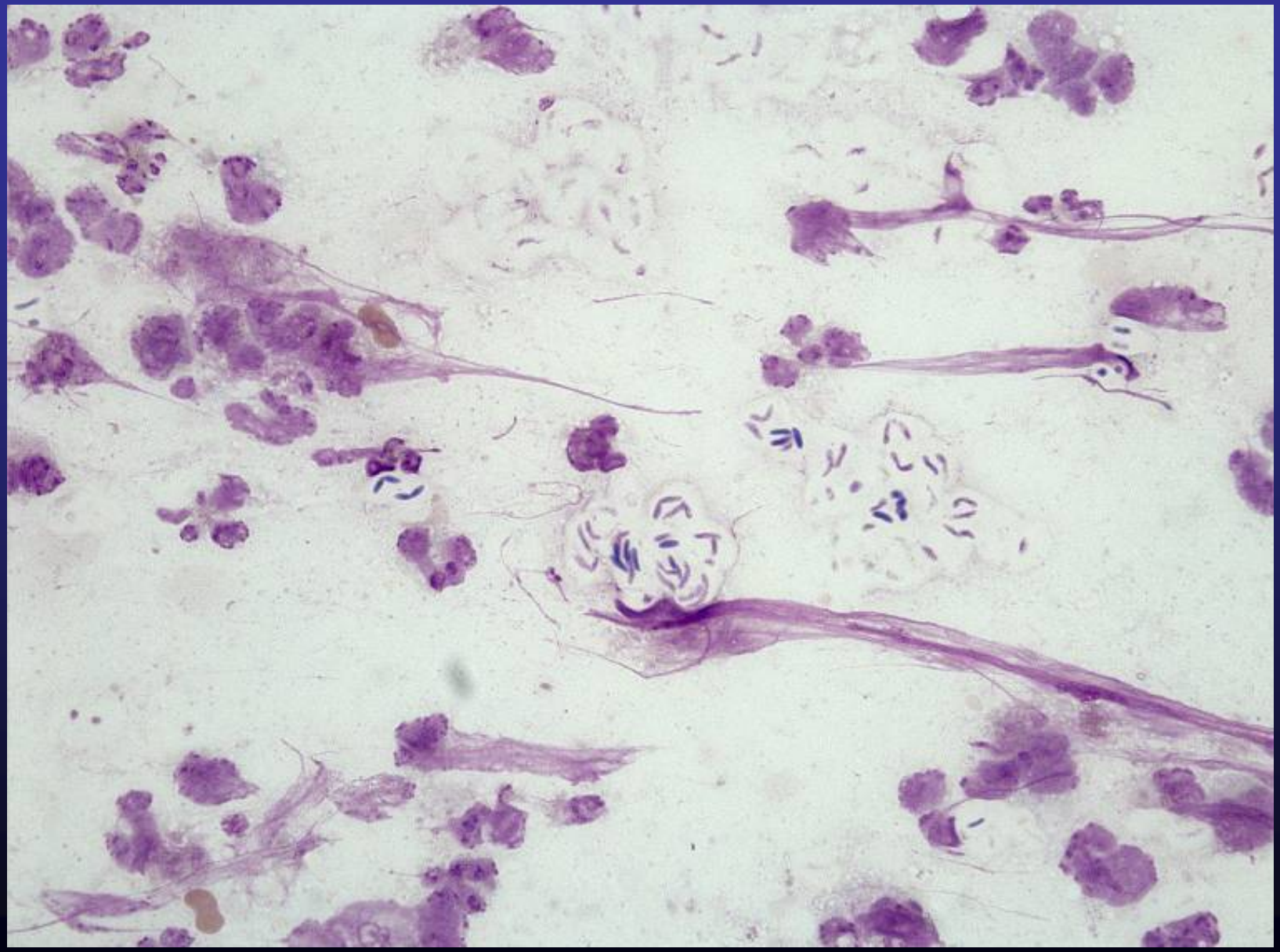
CReSA Centre de Recerca en Sanitat Animal

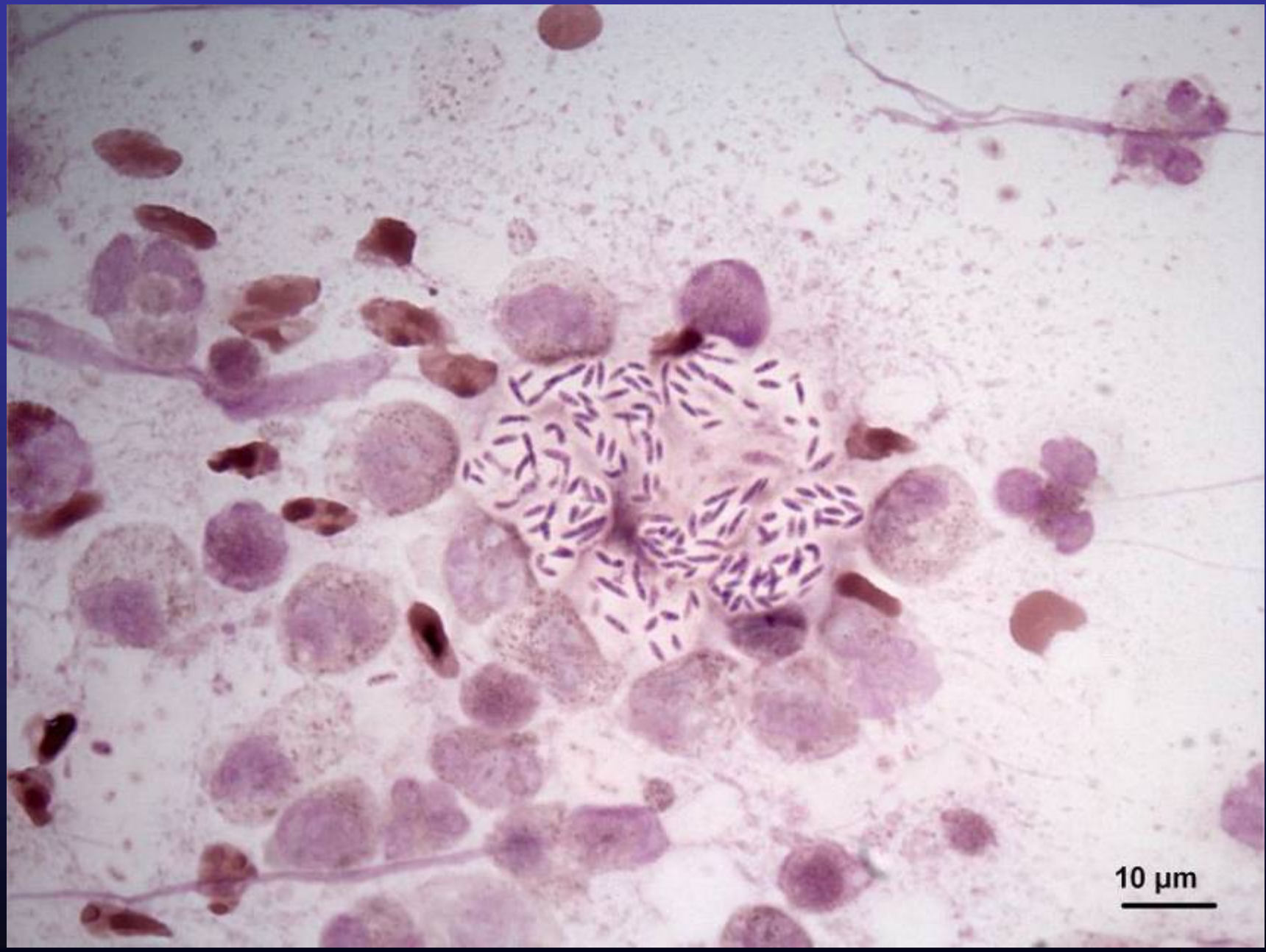
## CLINICAL HISTORY

- 4 domestic ferrets,  1-2 years old
- Different sources
- Acute dyspnea and fever
- Leucocytosis with neutrophilia
- Death: 4-6 days
- Pleural exudate: cytology

Ferret 2, Pleural exudate

# Pleural exudate




10 µm

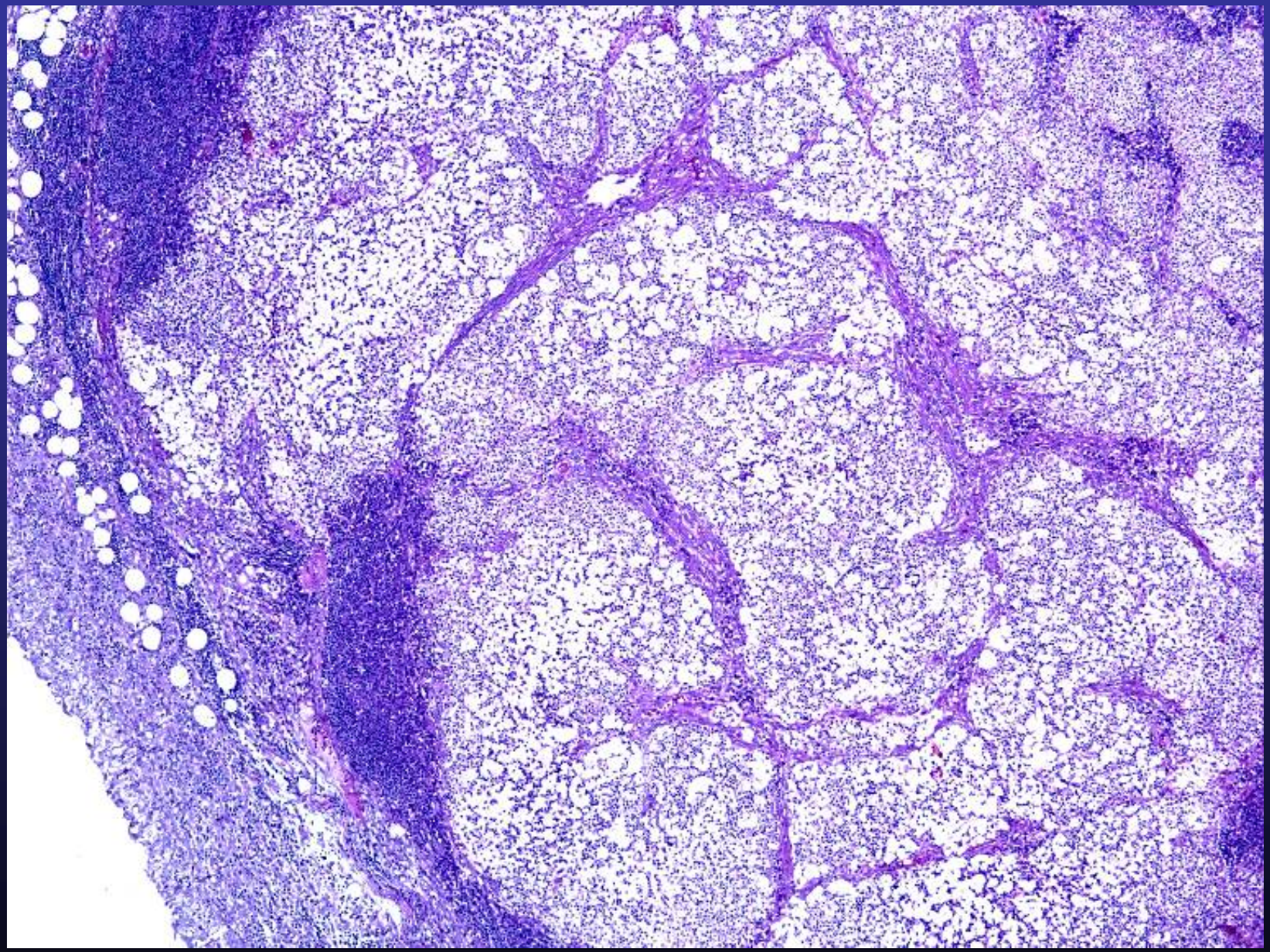
## MATERIAL AND METHODS

| Ferret | Cytology | Pathology | EM | Microbiology |
|---|---|---|---|---|
| 1 | √ | √ | √ | - |
| 2 | √ | - | √ | √ |
| 3 | √ | √ | √ | - |
| 4 | - | √ | - | √ |

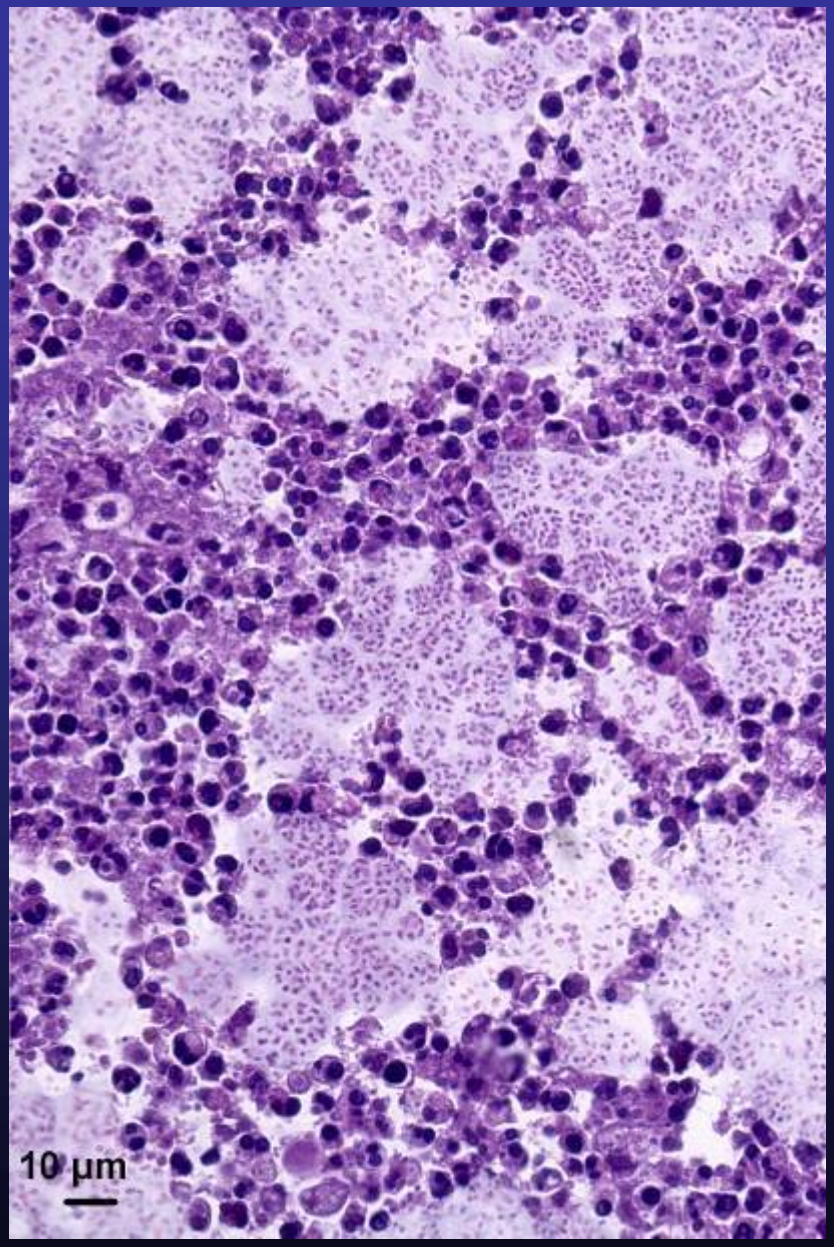
EM: Electron Microscopy

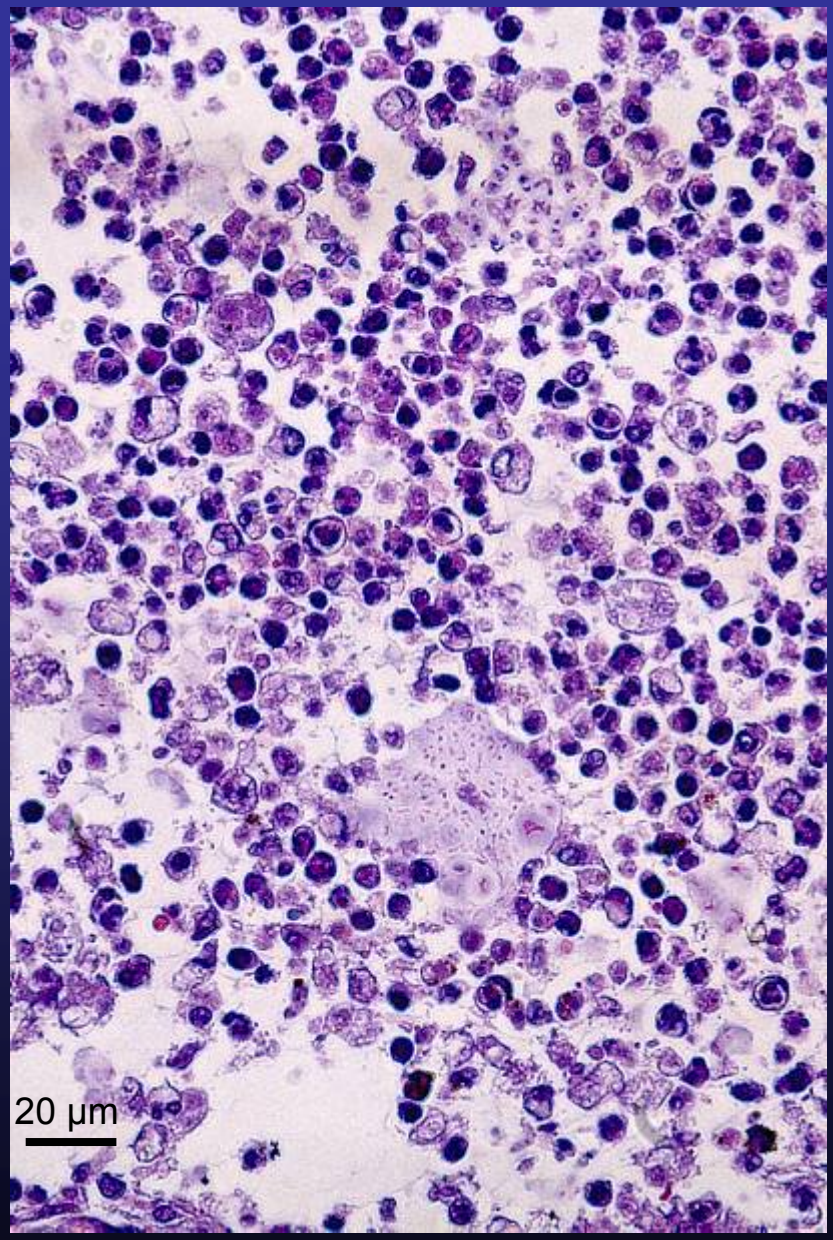
# PATHOLOGY

Ferret 1, Lung

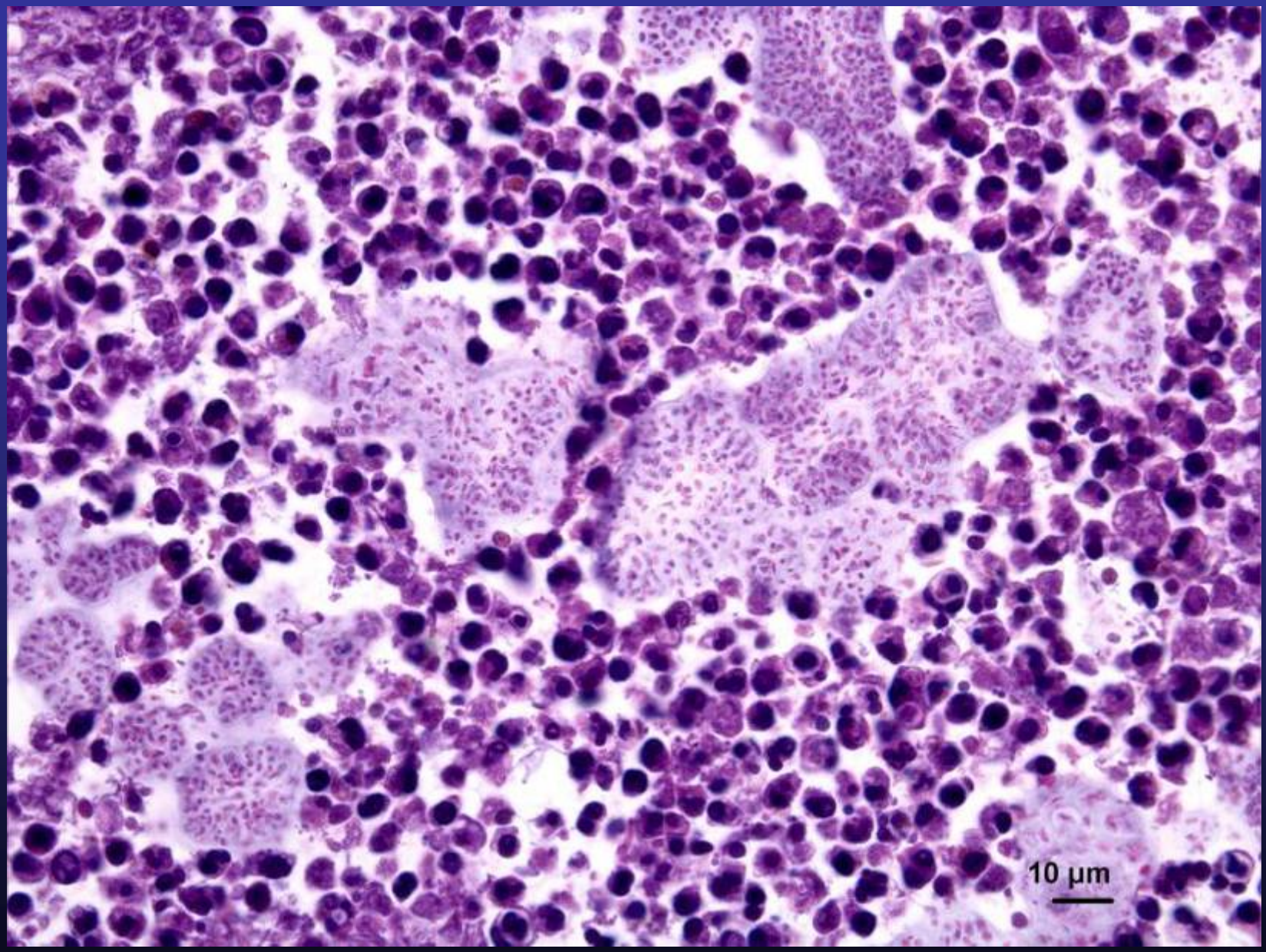


Ferret 1, Mediastinic Lymph Node

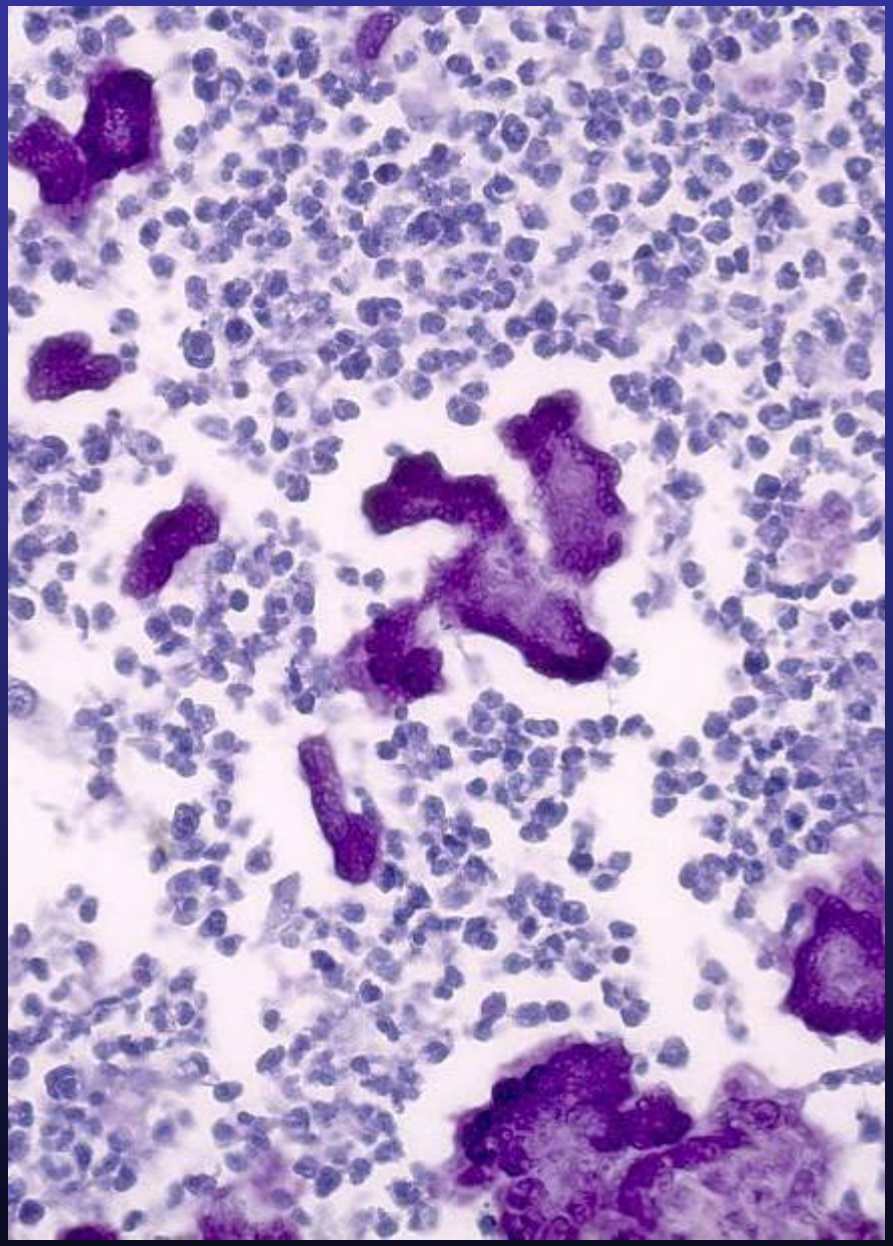


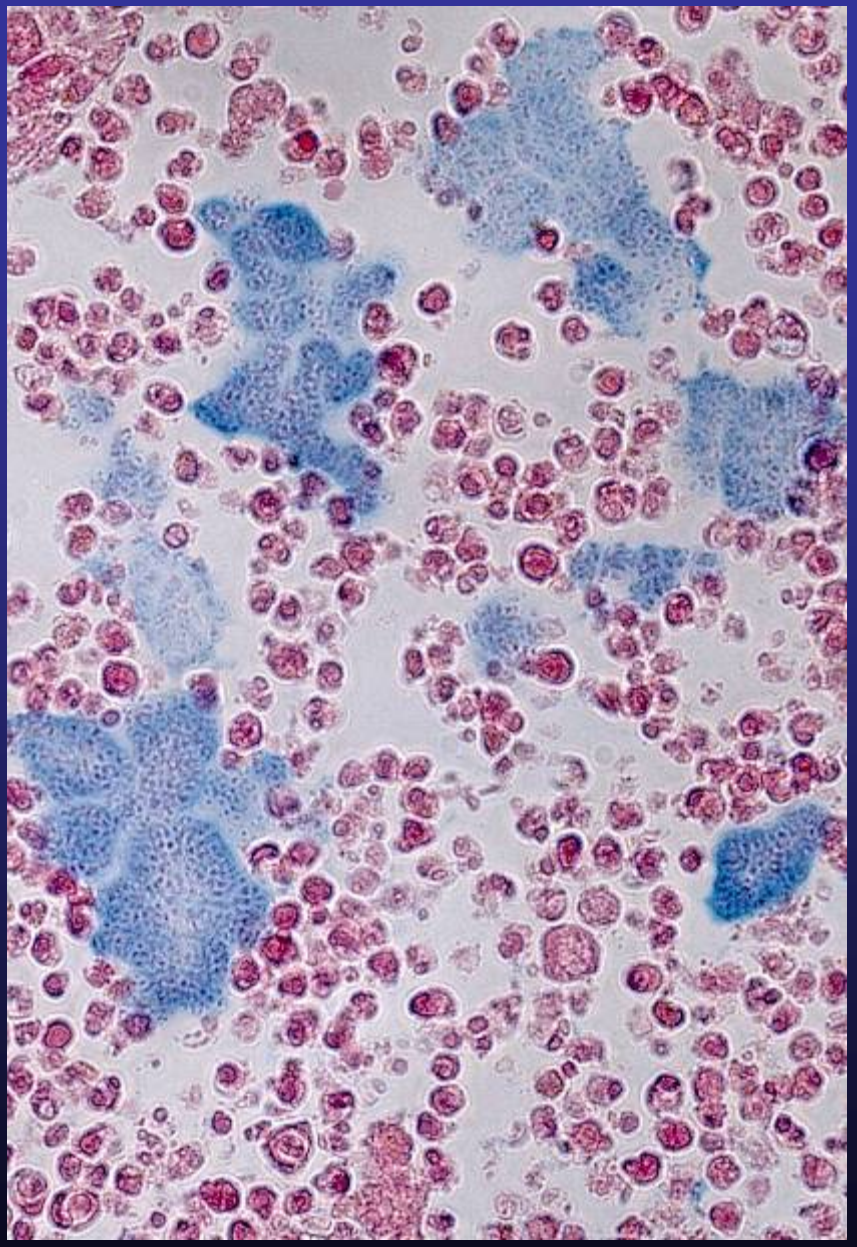

Ferret 1, Mediastinic Lymph Node




Ferret 1, Mediastinic Lymph Node



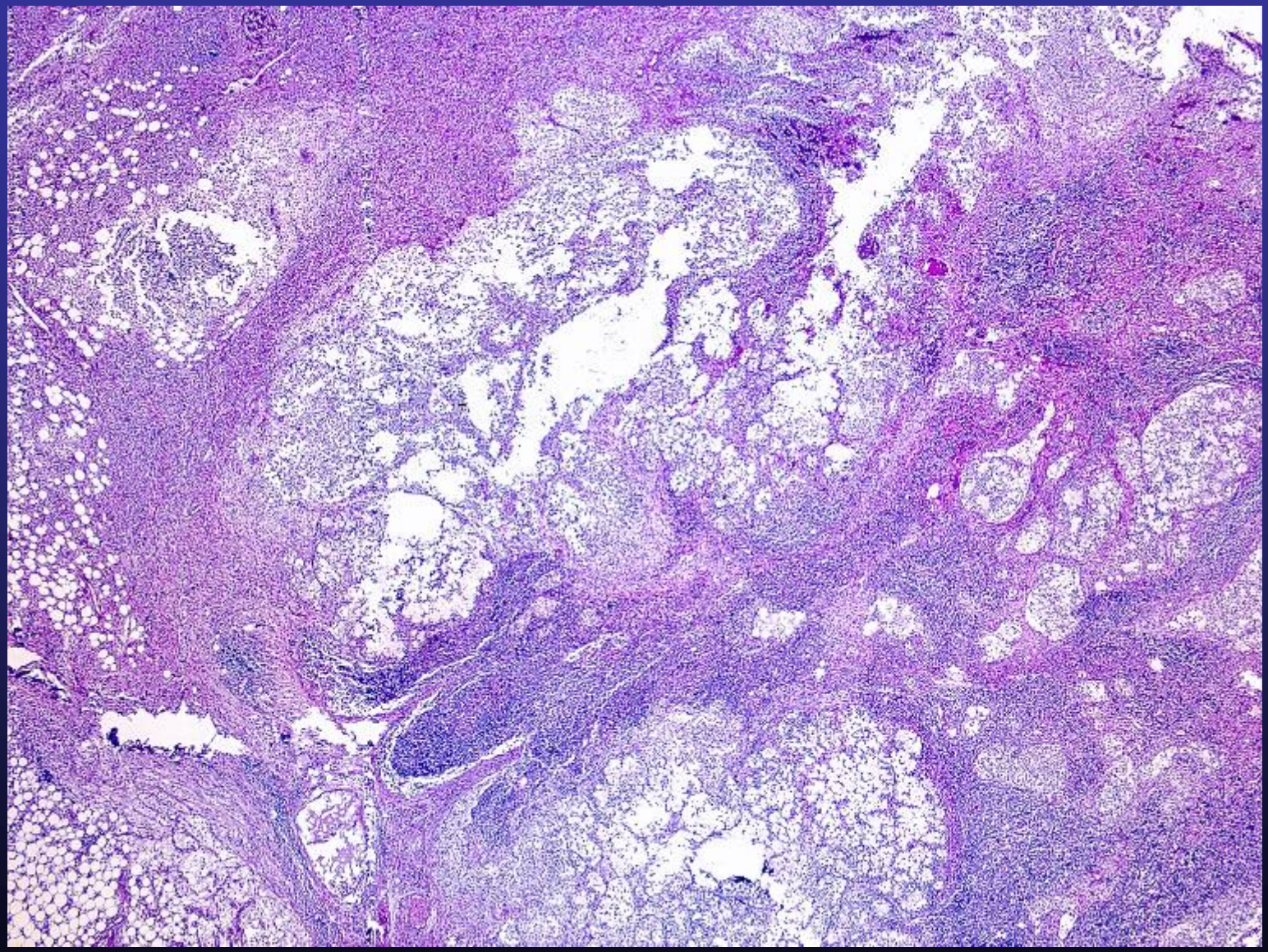
Ferret 1, Mediastinic Lymph Node (PAS)



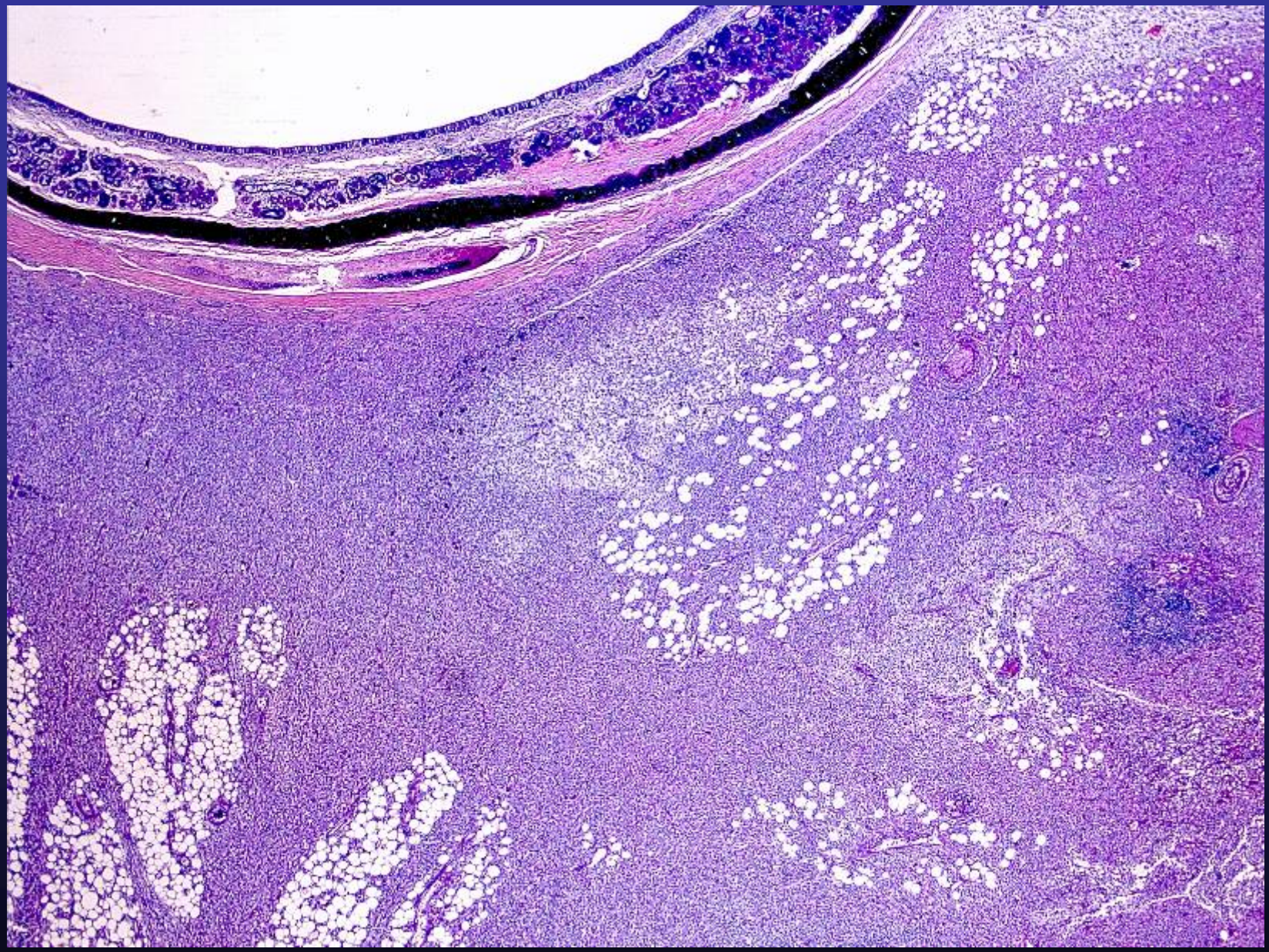
Alcian Blue

Ferret 3, Mediastinum (formaline-fixed)

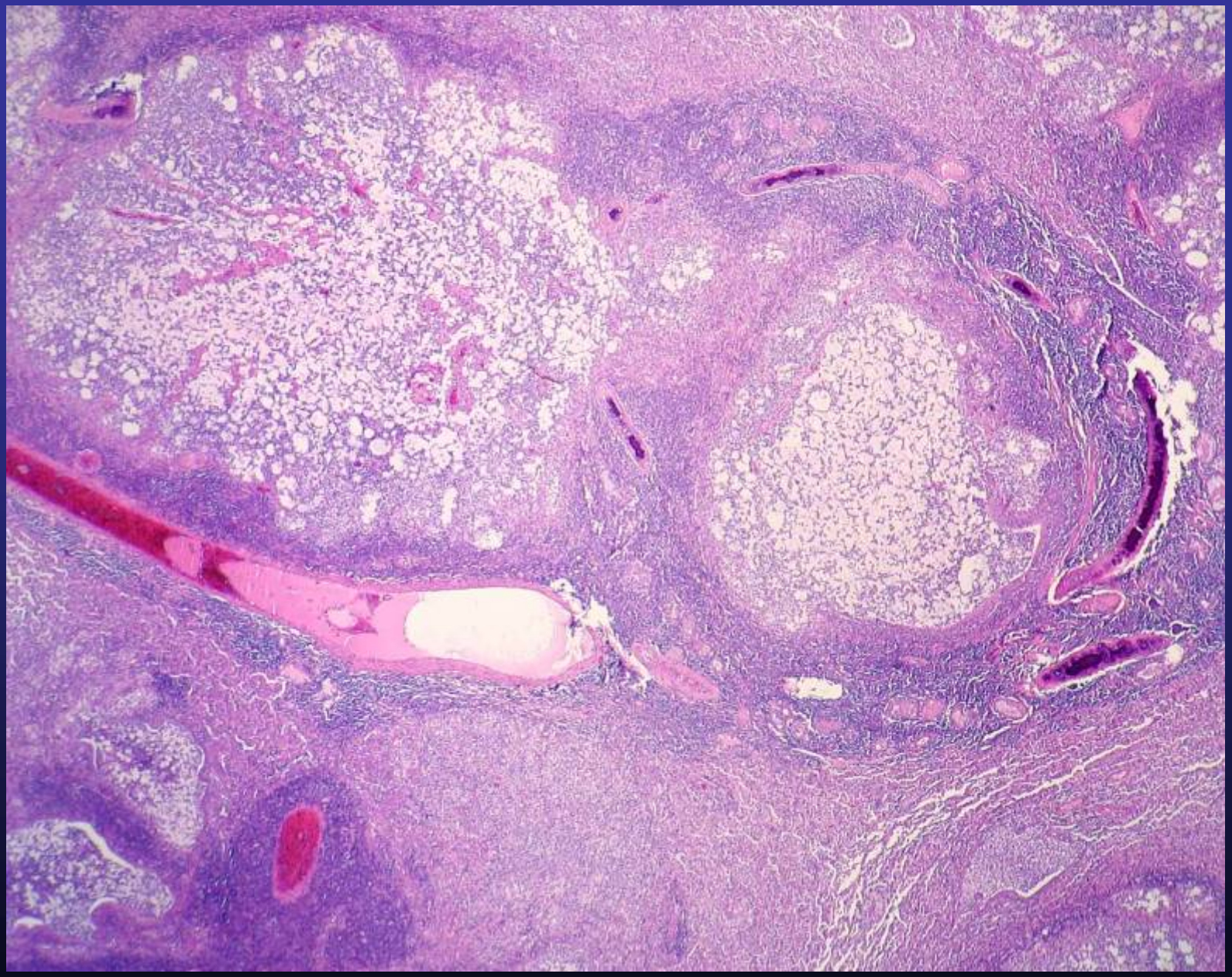
# HISTOPATHOLOGY



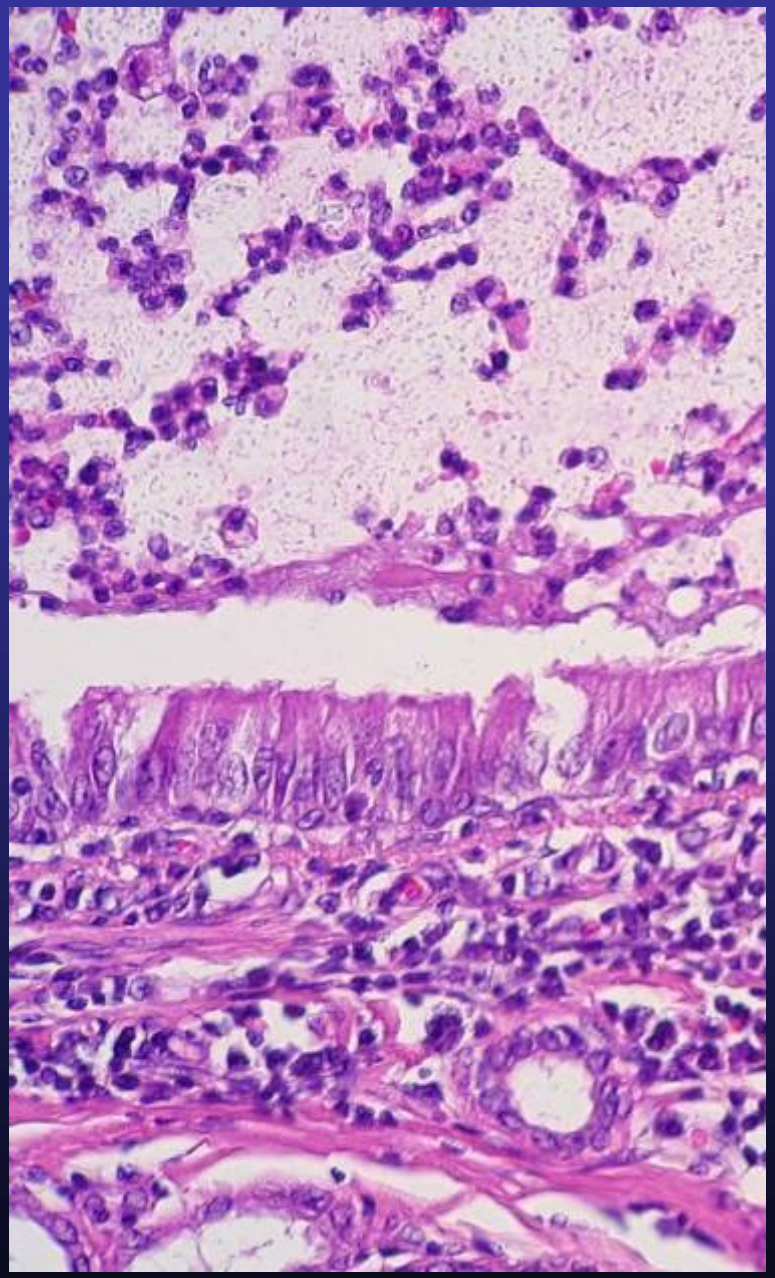
Ferret 3, Mediastinum



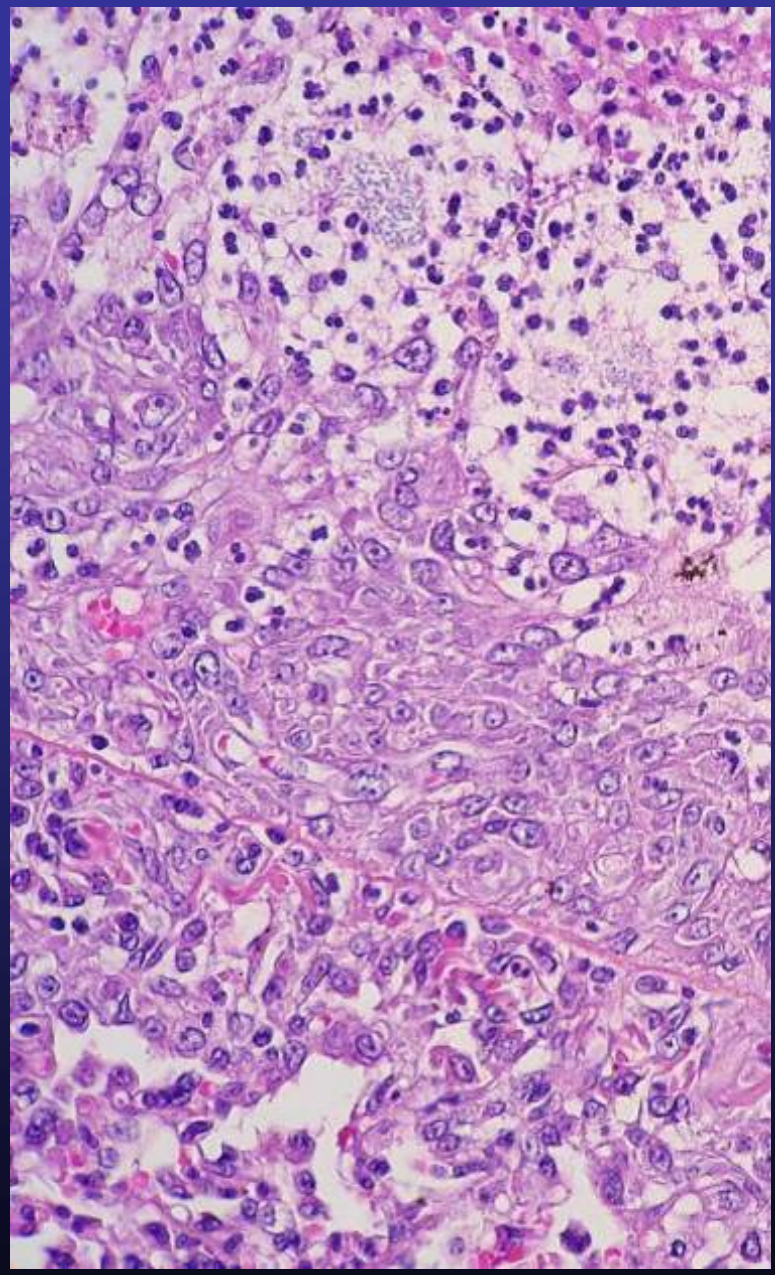
Ferret 3, Mediastinum



Ferret 3, Lung



Ferret 3, Lung



Ferret 3, Pleura

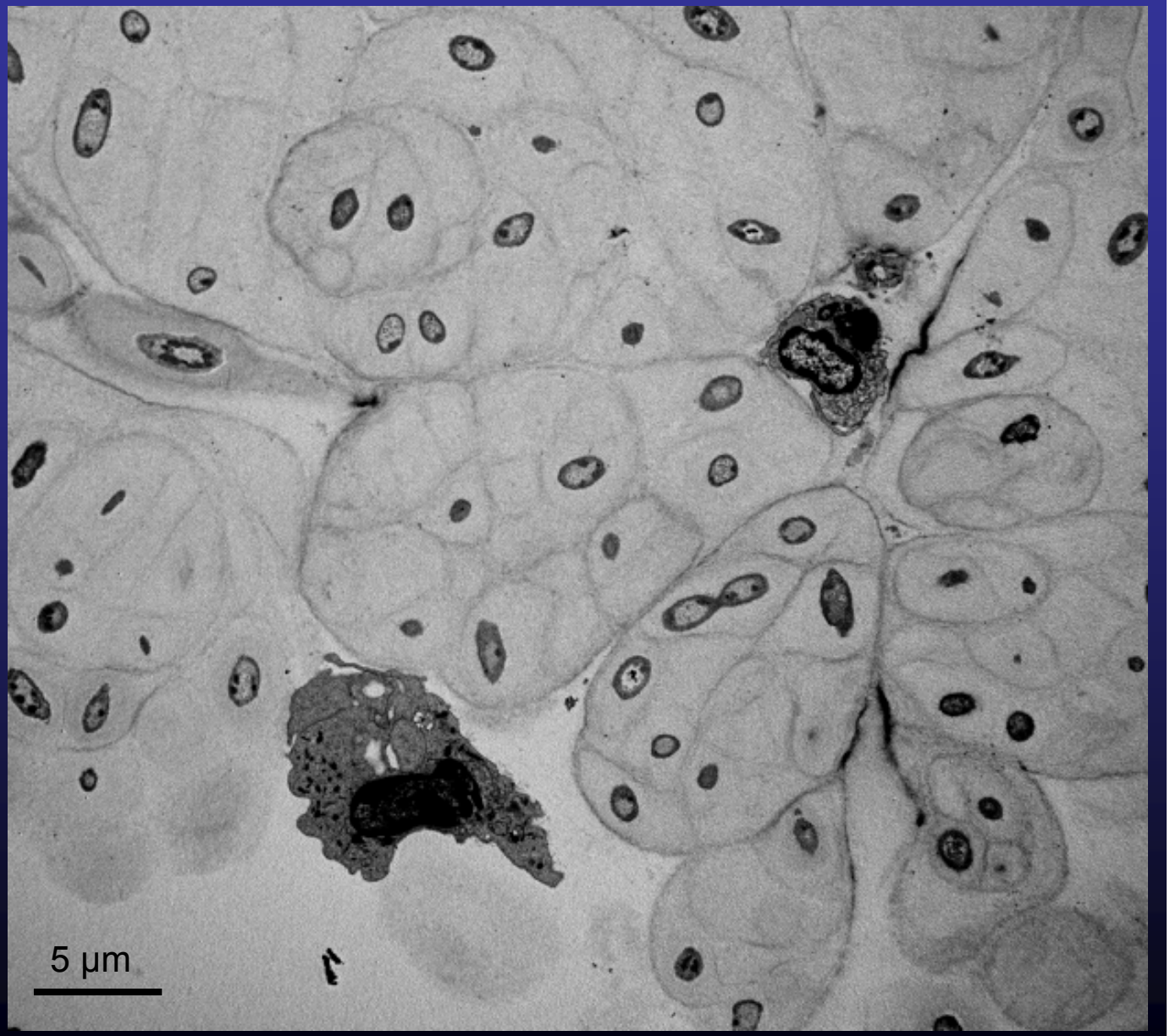
## MORPHOLOGICAL DIAGNOSES

- Ferret 1.
  - Pyogranulomatous-necrotizing mediastinic lymphadenitis
- Ferret 3 and 4.
  - Pyogranulomatous-necrotizing pleuropneumonia, lymphadenitis and mediastinitis

# ELECTRON MICROSCOPY

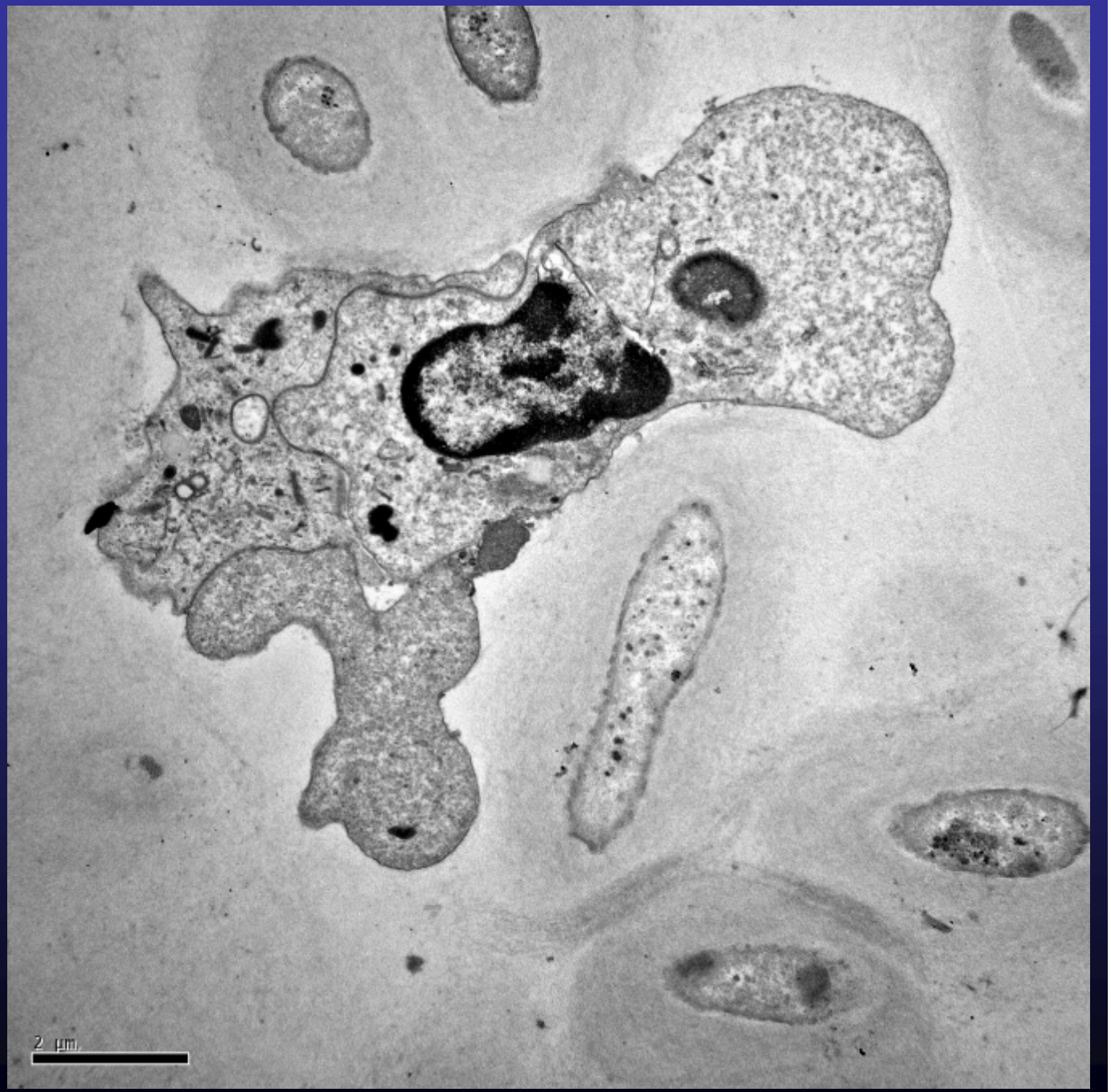
Ferret 2,

Fresh pleural exudate



Ferret 2,

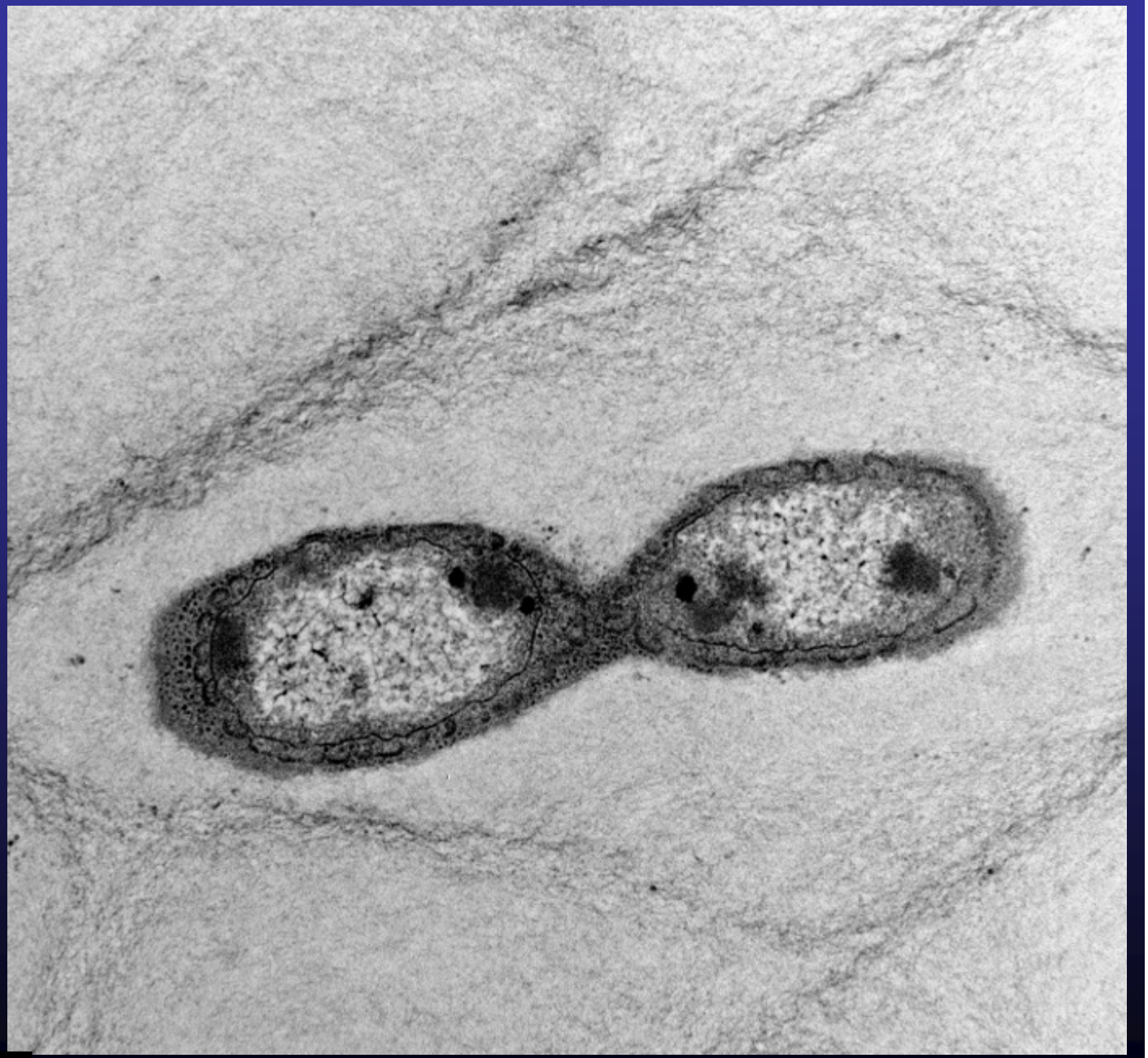
Fresh pleural exudate




2 µm

Ferret 2,

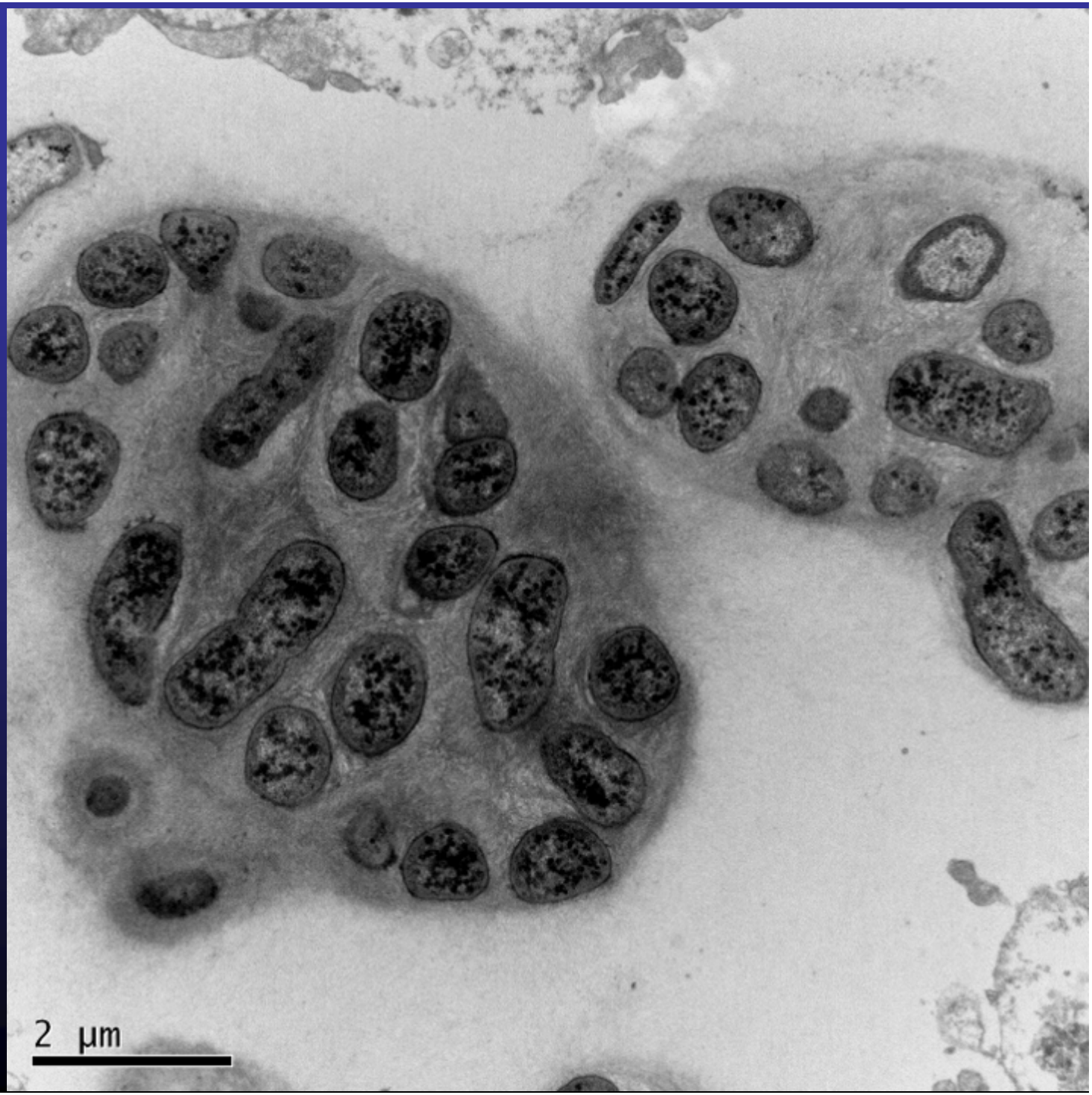
Fresh pleural exudate



Ferret 3,

Lung

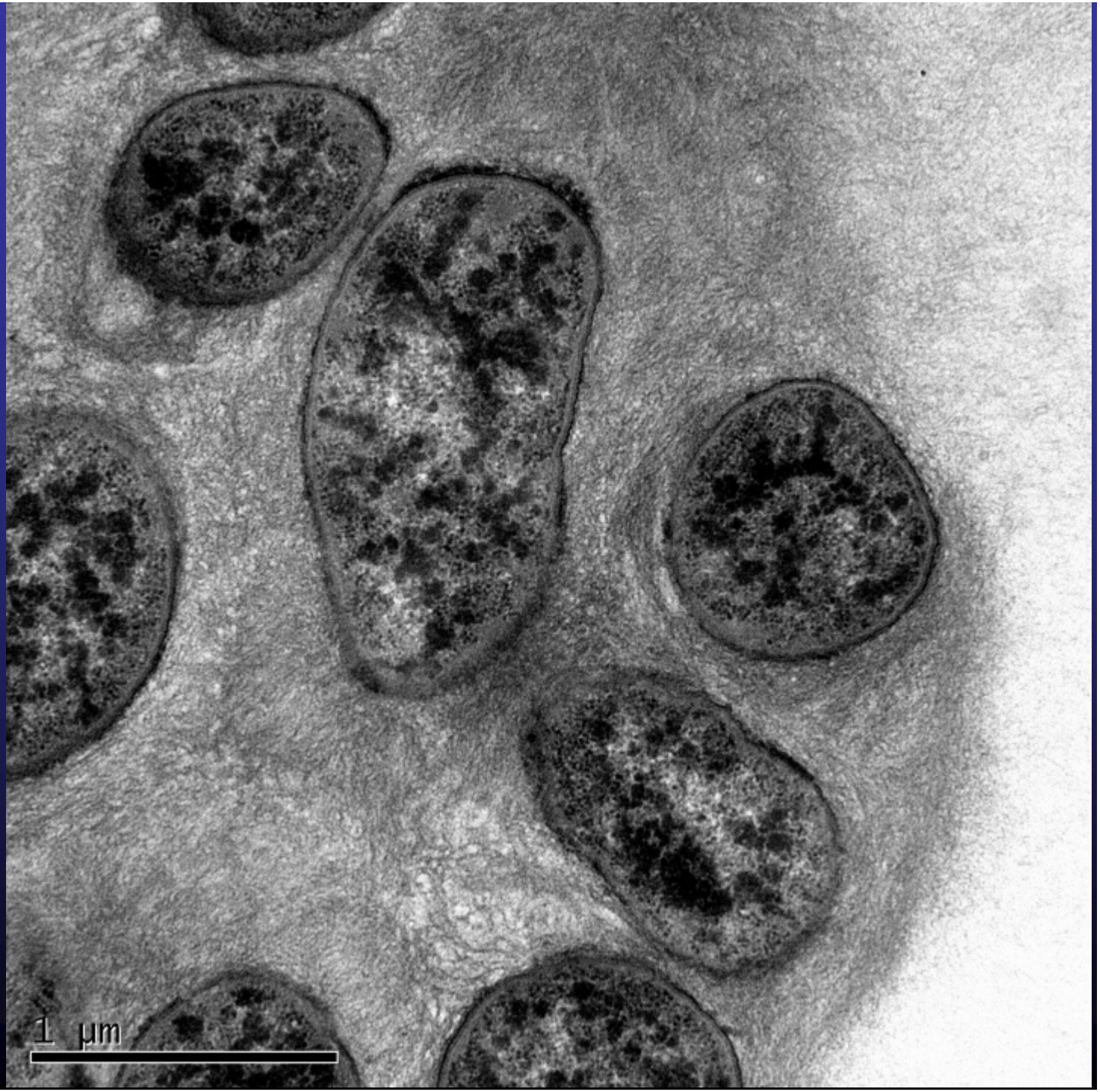
(Formaline-fixed)



Ferret 1,

Lymph node

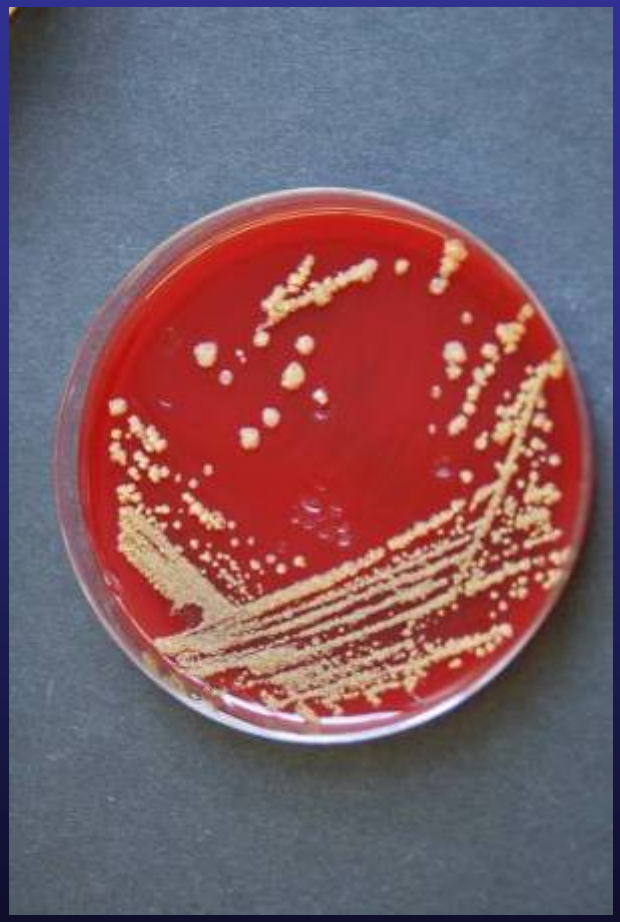
(Formaline-fixed)



# MICROBIOLOGY

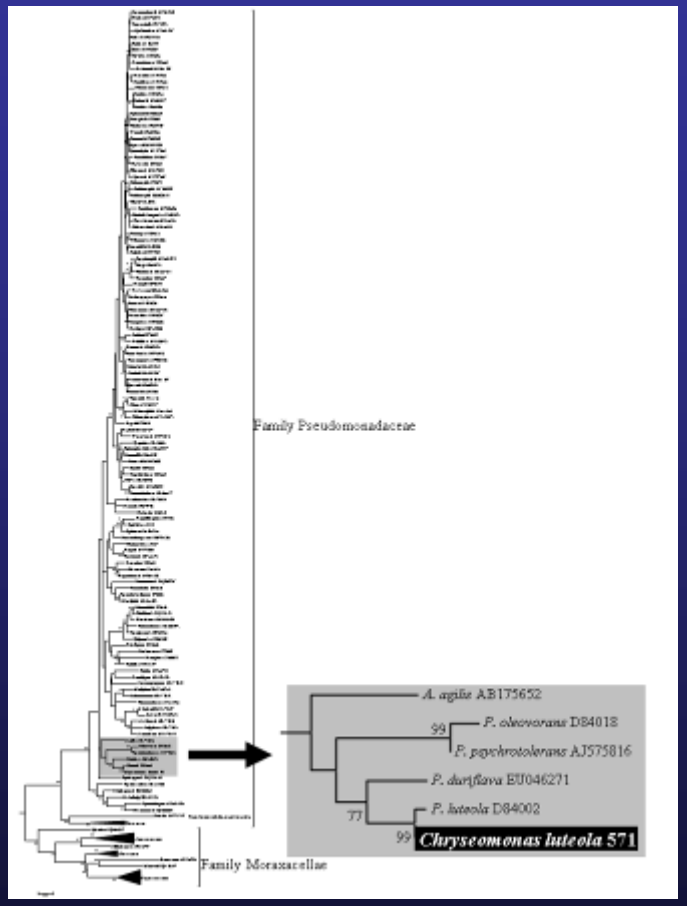
Ferret 2: pleural exudate

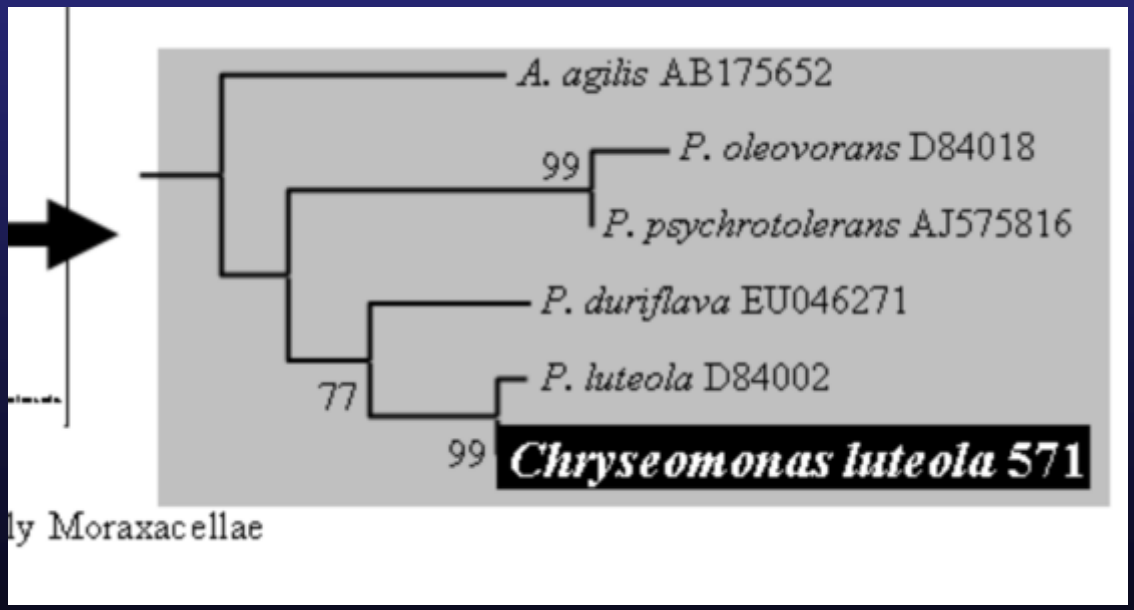
Ferret 4: lung



*Pseudomonas (Chryseomonas) luteola*

# MOLECULAR CHARACTERIZATION



## OTHER TECHNIQUES

- Immunohistochemistry
  - Influenza: neg.
  - Canine distemper: neg.
  - Ferret systemic coronavirus: neg.
- *In situ* hybridization
  - *Pneumocystis*: neg.
- Special stains
  - PAS, Grocott: neg.
  - Zhiel-Neelsen: neg.
  - Gram: negative
- Fungal culture: negative

## DISCUSSION

# *Pseudomonas*

- Phenotypes (Cobb, J Immunol, 2004)
  - Motility: flagella. Acute infections
  - Mucoidy: exopolysaccharide. Chronic infections
    - Avoid phagocytosis
    - Cystic fibrosis in humans: *Pseudomonas aeruginosa*
- *Pseudomonas luteola*
  - Exopolysaccharide capsule
  - Ions absortion (Ozdemir, Bioresour Technol, 2005)
- Secondary pathogen?

## CONCLUSIONS

- First description in ferrets
- Fatal pyogranulomatous pleuropneumonia and mediastinitis
- *Pseudomonas luteola* diferential diagnosis

# THANK YOU!!