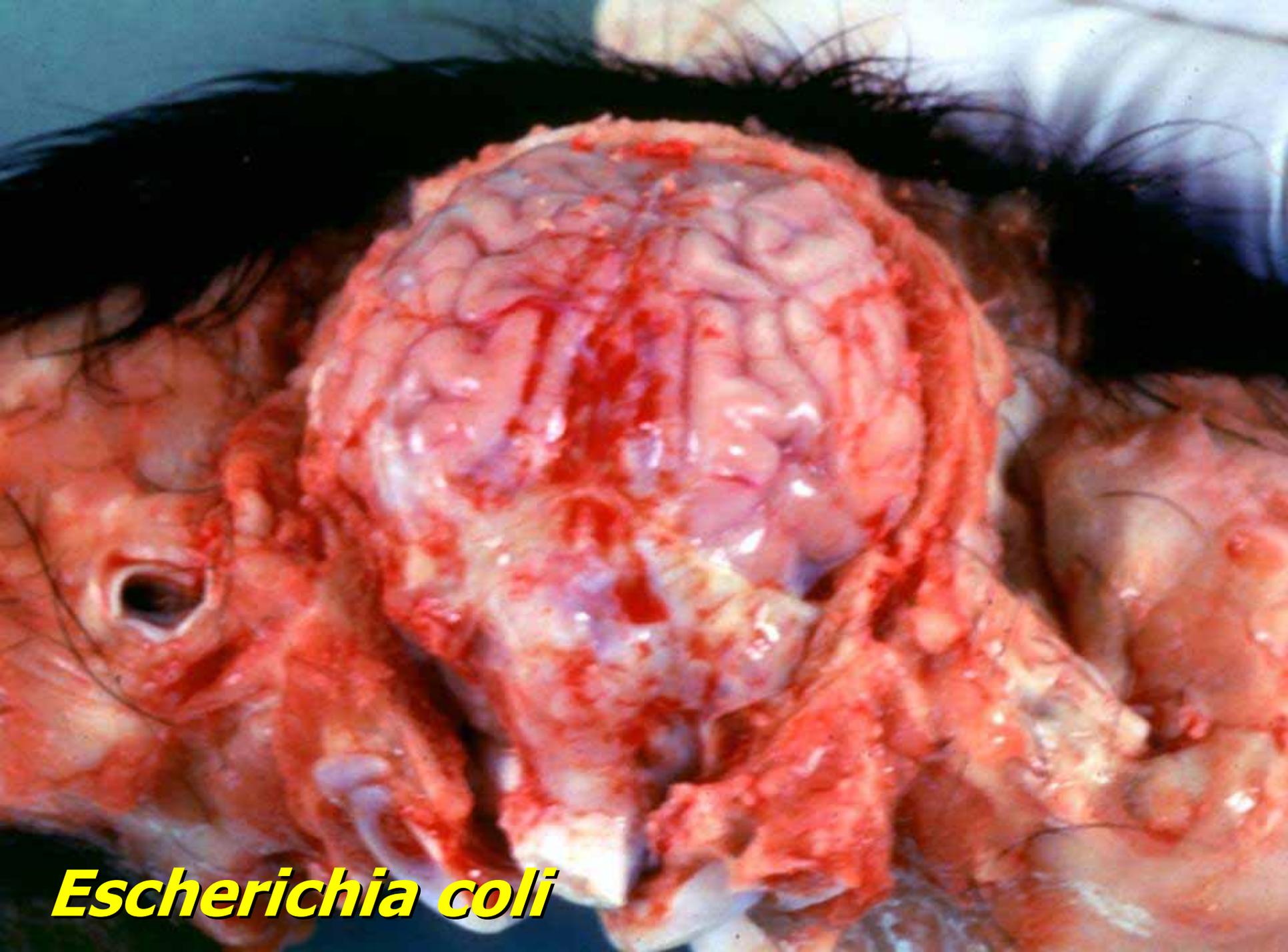


Mycoplasma hyorhinis



Escherichia coli

Erysipelas

- Still occurs in swine raised entirely in environmentally regulated buildings
- *E. rhusiopathiae* causes disease in all ages
- Mortality is highest and lesions are most extensive and severe in suckling and recently weaned pigs
- In growing and finishing pigs; pigs may be found dead with few gross lesions
- Renal cortical petechiae, enlarged spleen, lameness with proliferative synovitis and fibrous periarthritits, pyrexia, anorexia, few cutaneous infarcts and occasional abortions



Erysipelas



Erysipelas



Erysipeloid



Erysipelas



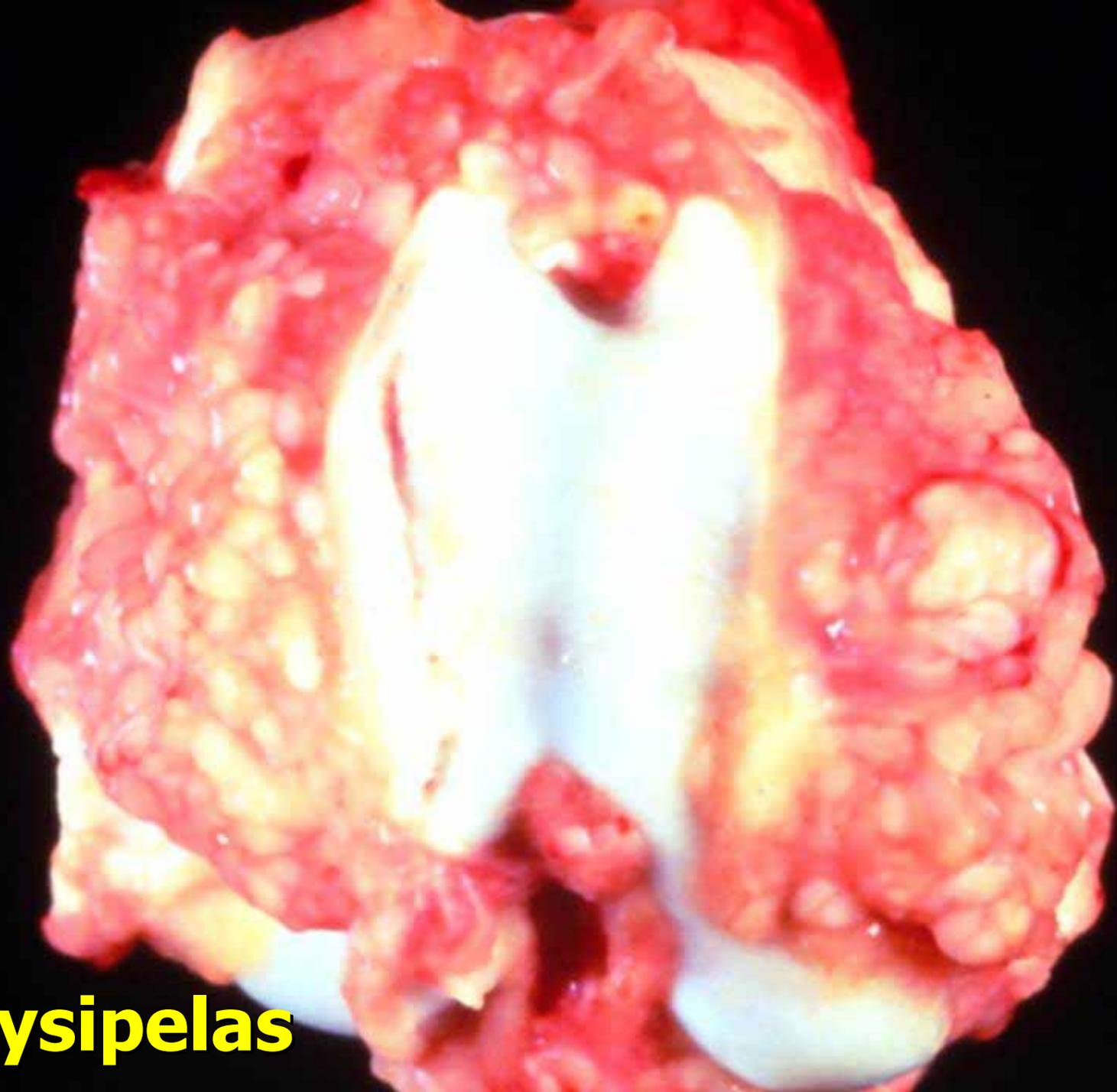
Erysipelas



Erysipelas



Erysipelas



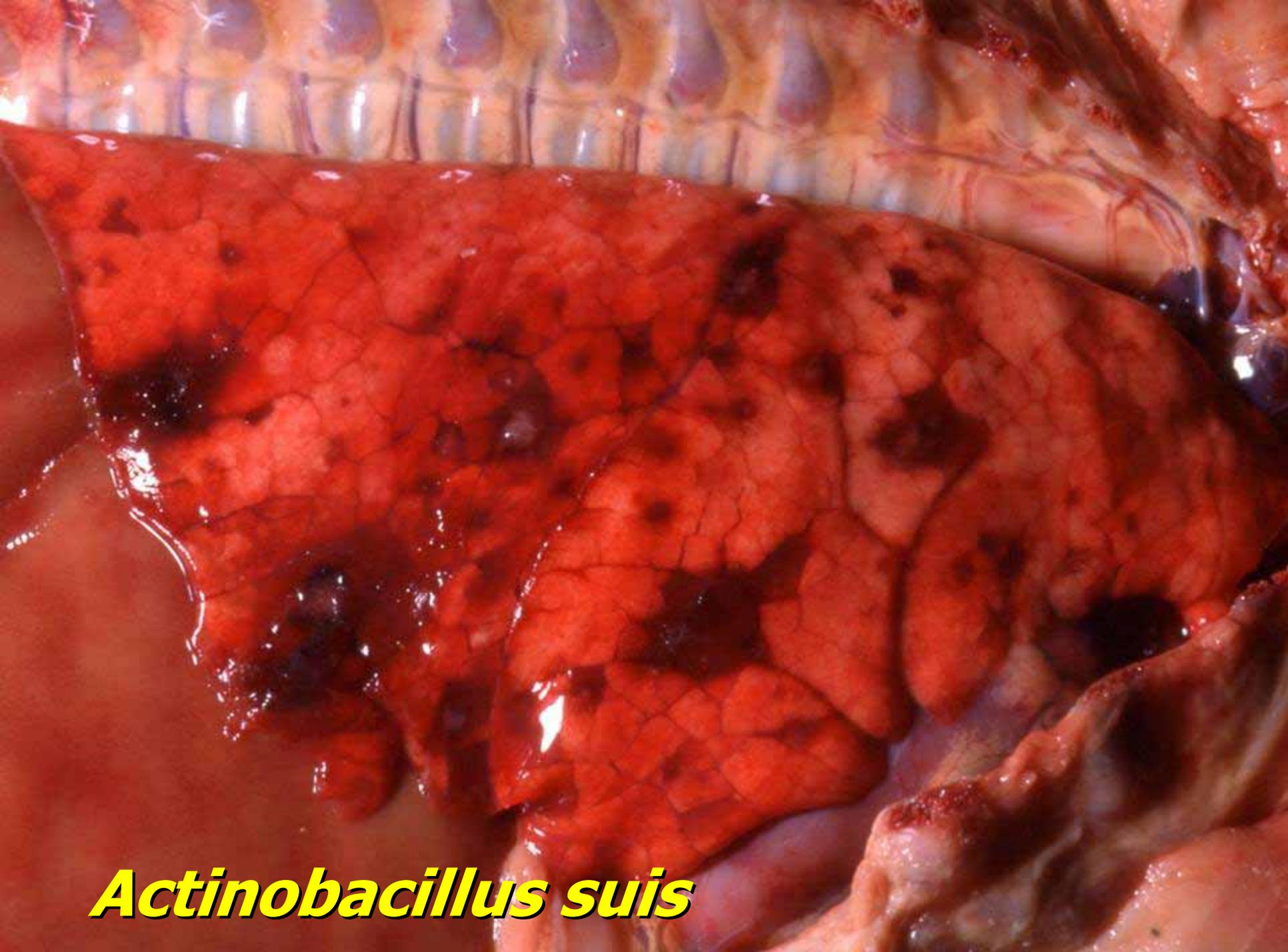
Erysipelas

Actinobacillus suis

- Prevalence in herds is unknown
- Disease: high health herds, 2-28 days of age
- Virulence factors: exotoxins similar to APP
- Septic-embolic disease: multifocal or diffuse fibrinonecrotic pleuropneumonia
 - widespread hemorrhages – meningitis
 - vegetative endocarditis – skin infarcts
 - fibrinous pericarditis – fibrinous arthritis
- Diagnosis: lesions, culture



Actinobacillus suis



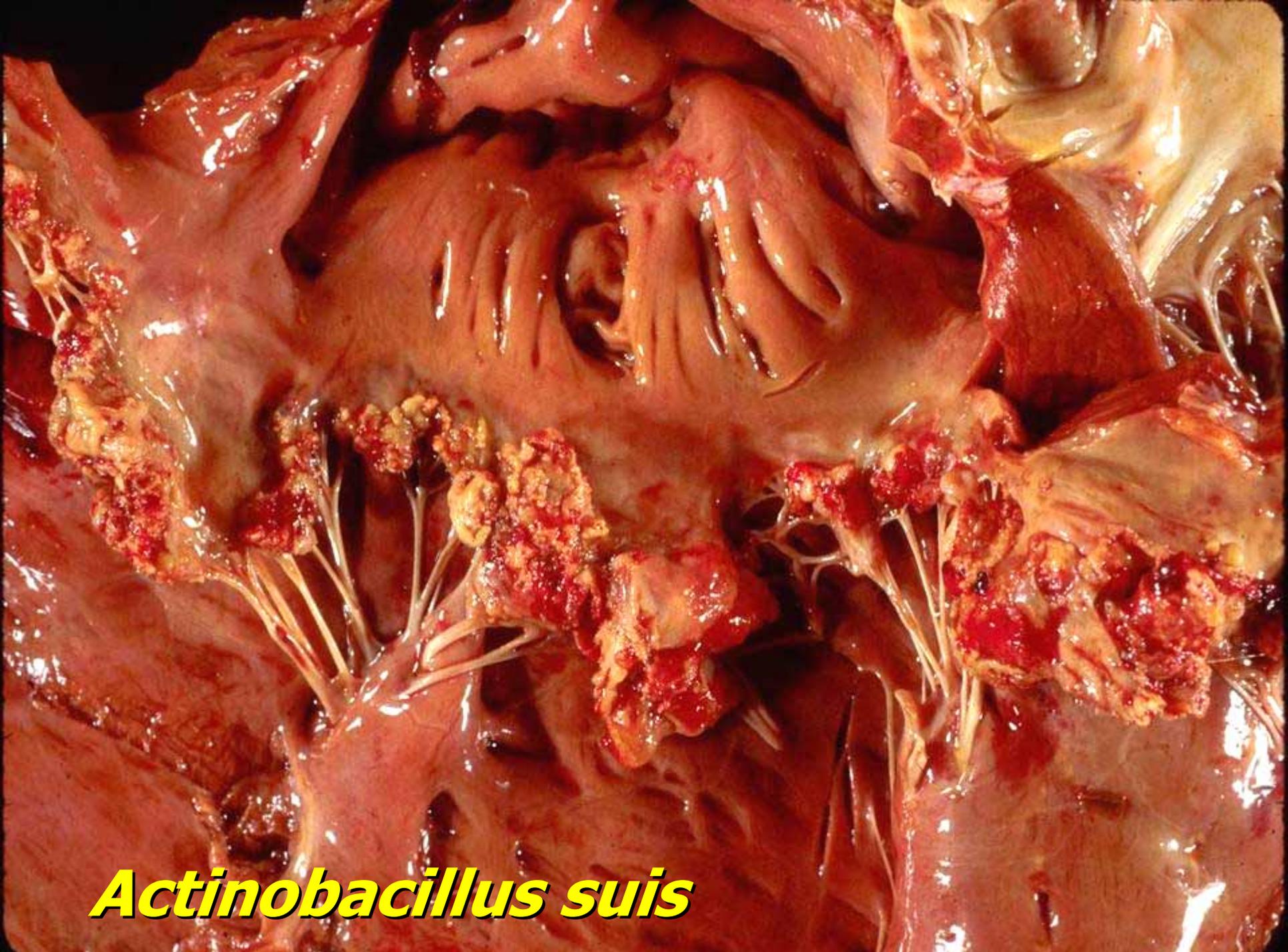
Actinobacillus suis



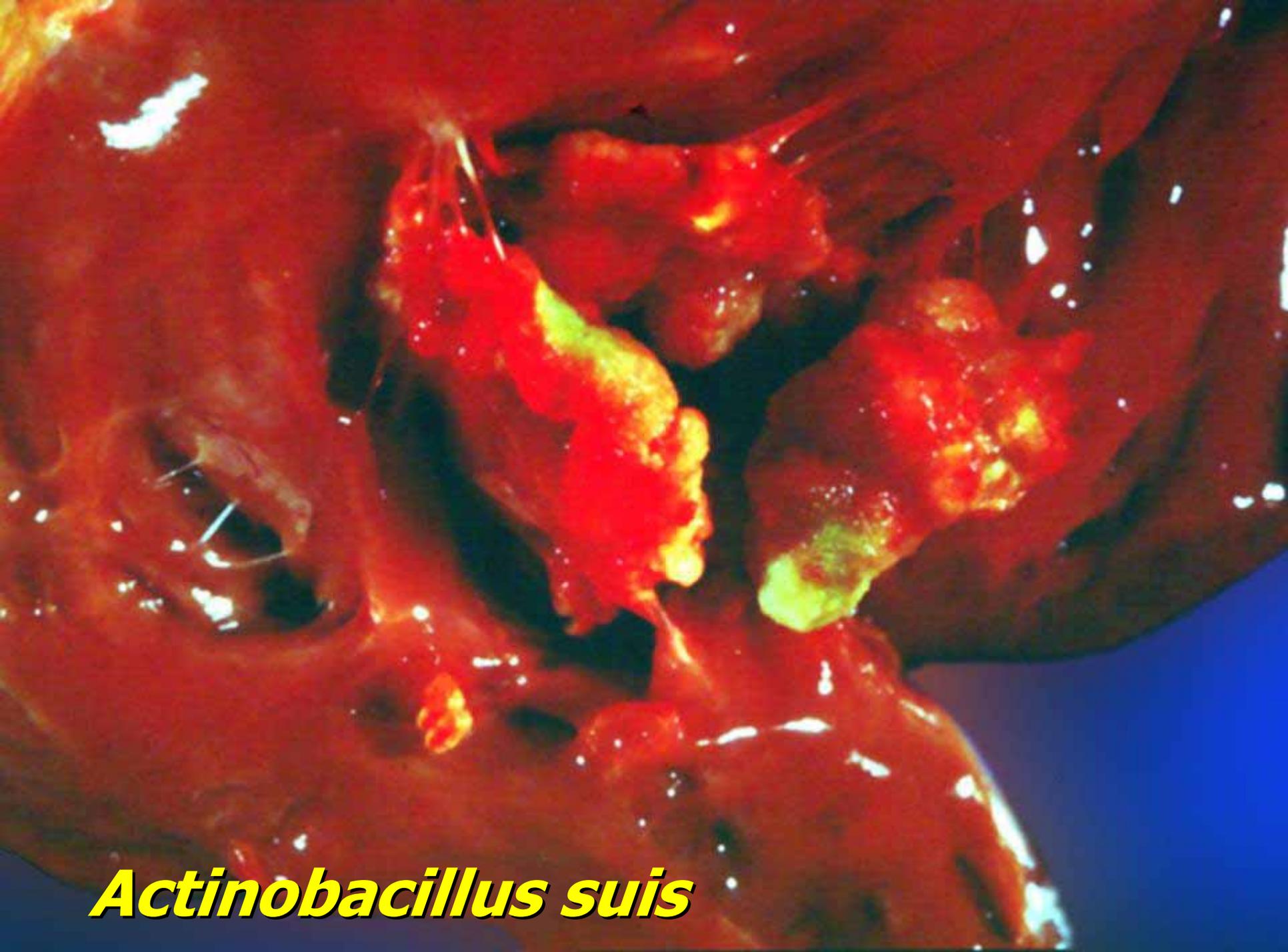
Actinobacillus suis



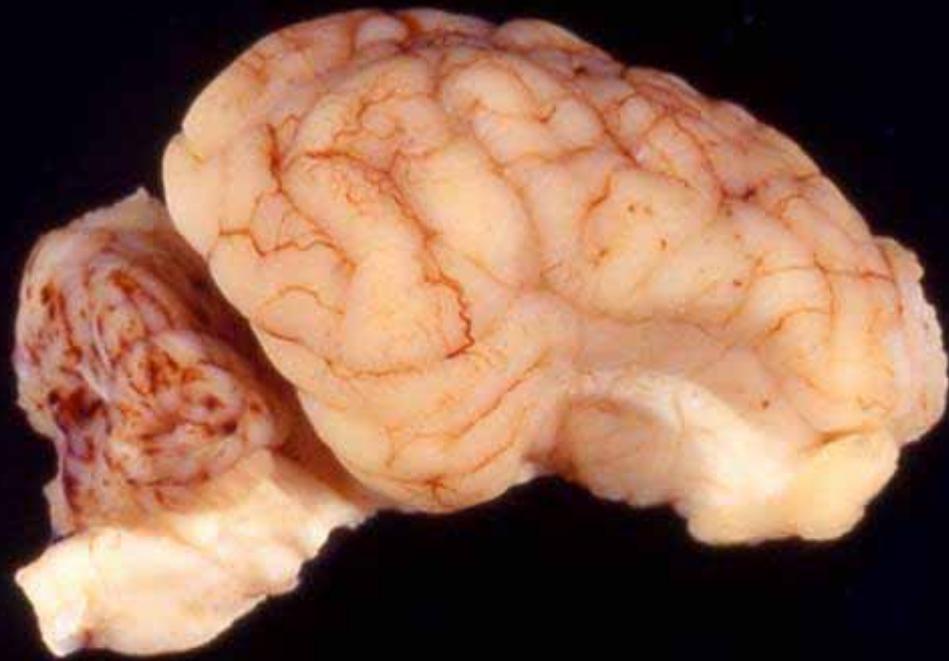
Actinobacillus suis



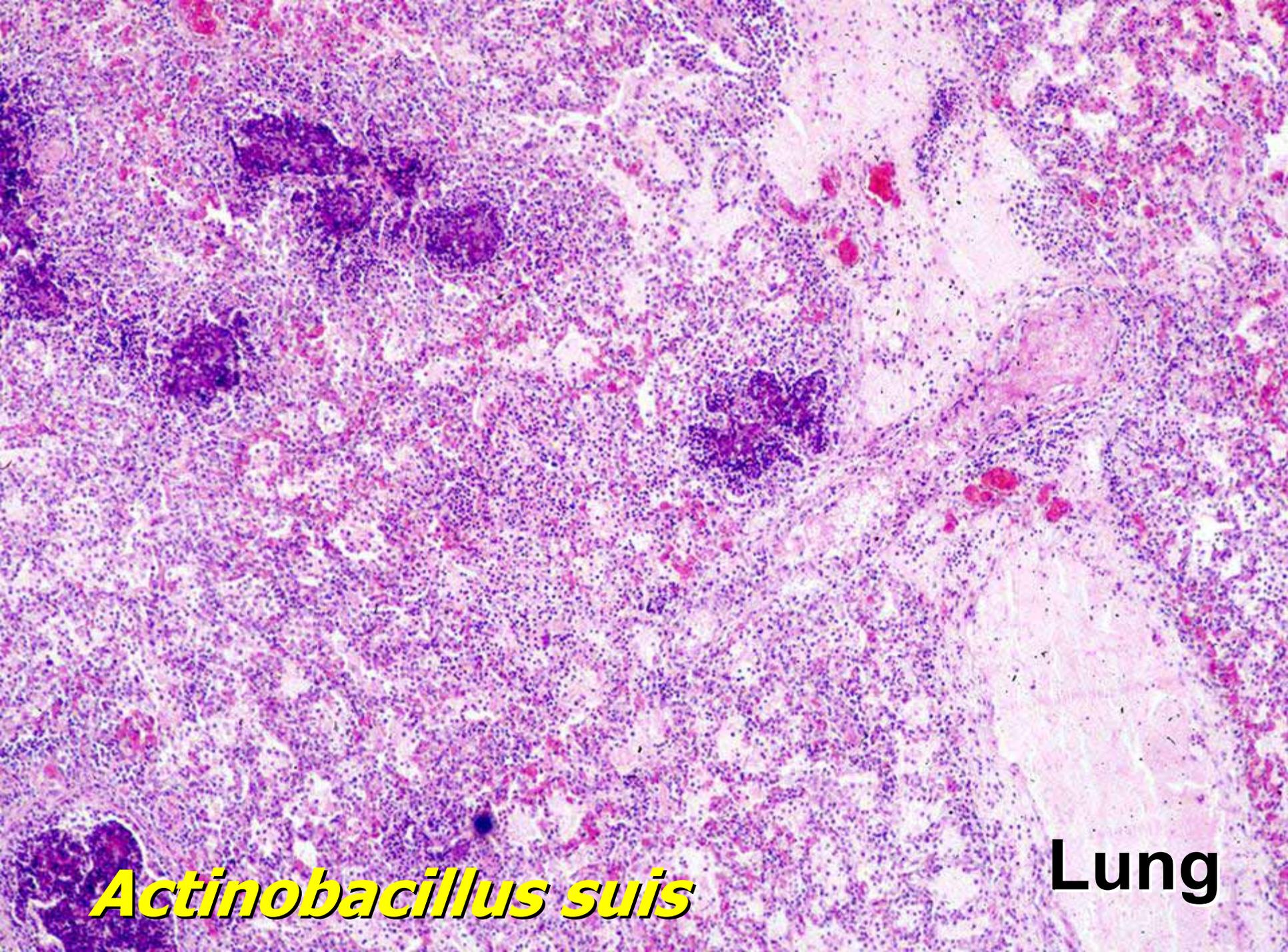
Actinobacillus suis



Actinobacillus suis

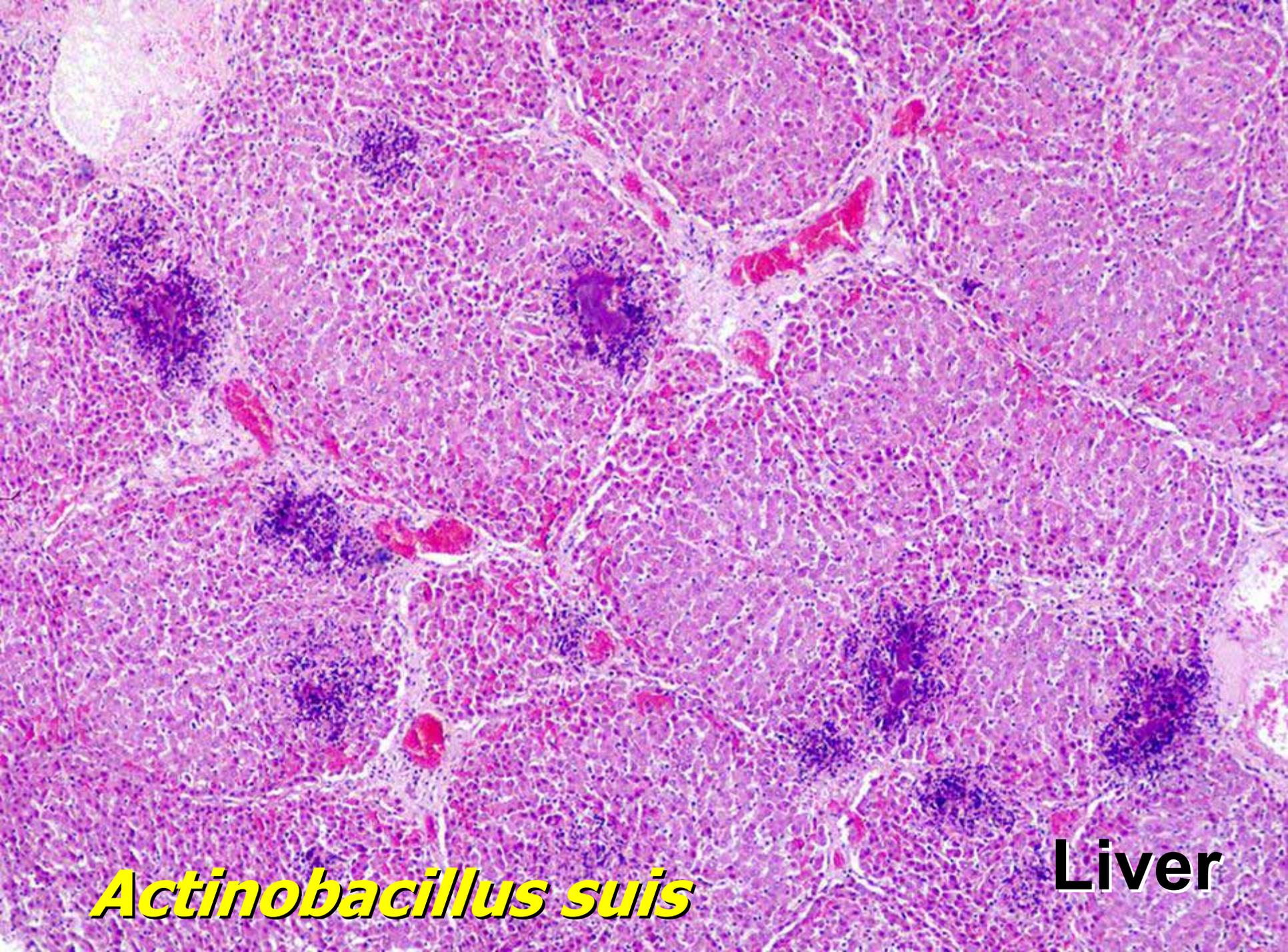


Actinobacillus suis



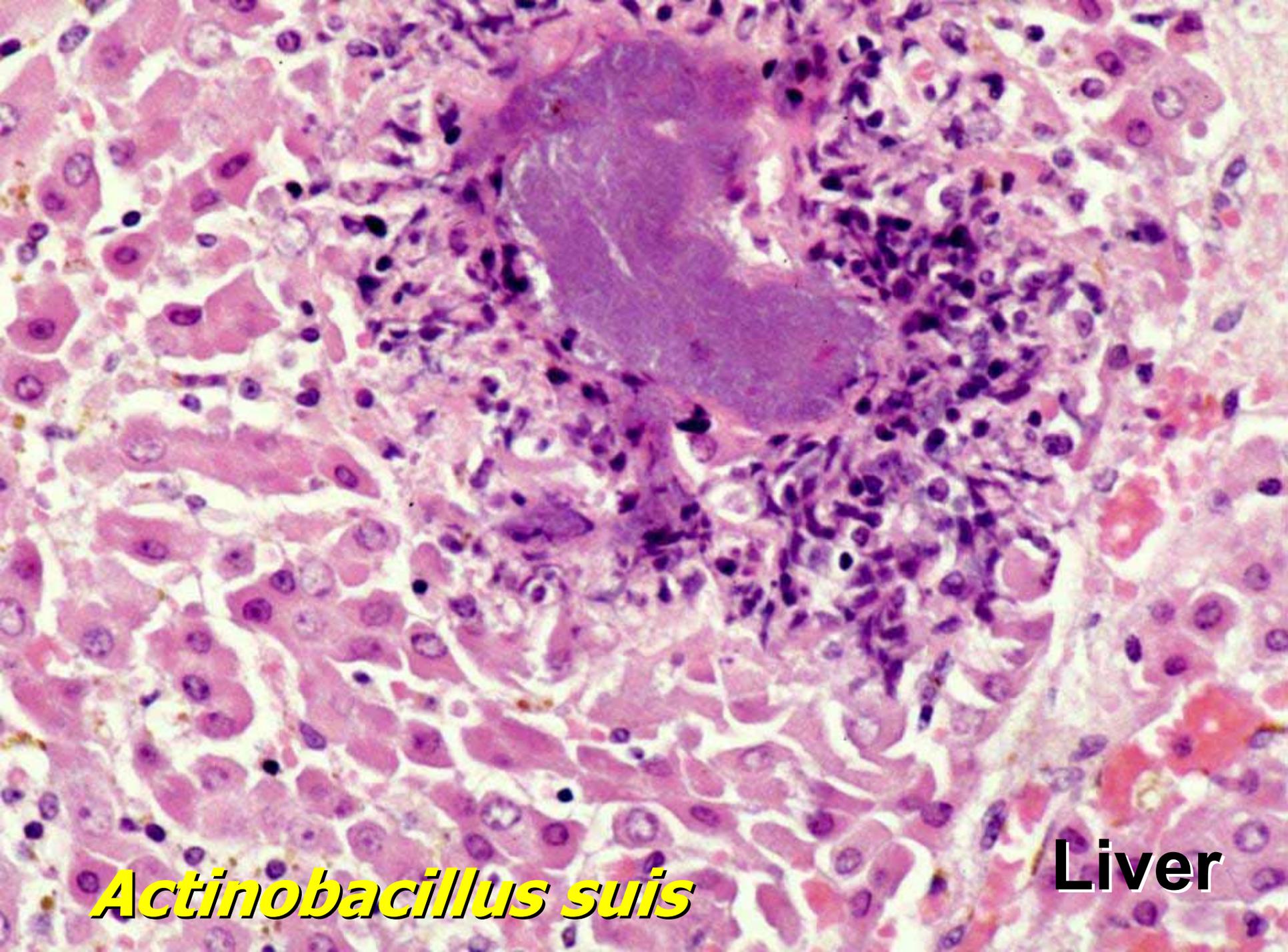
Actinobacillus suis

Lung



Actinobacillus suis

Liver

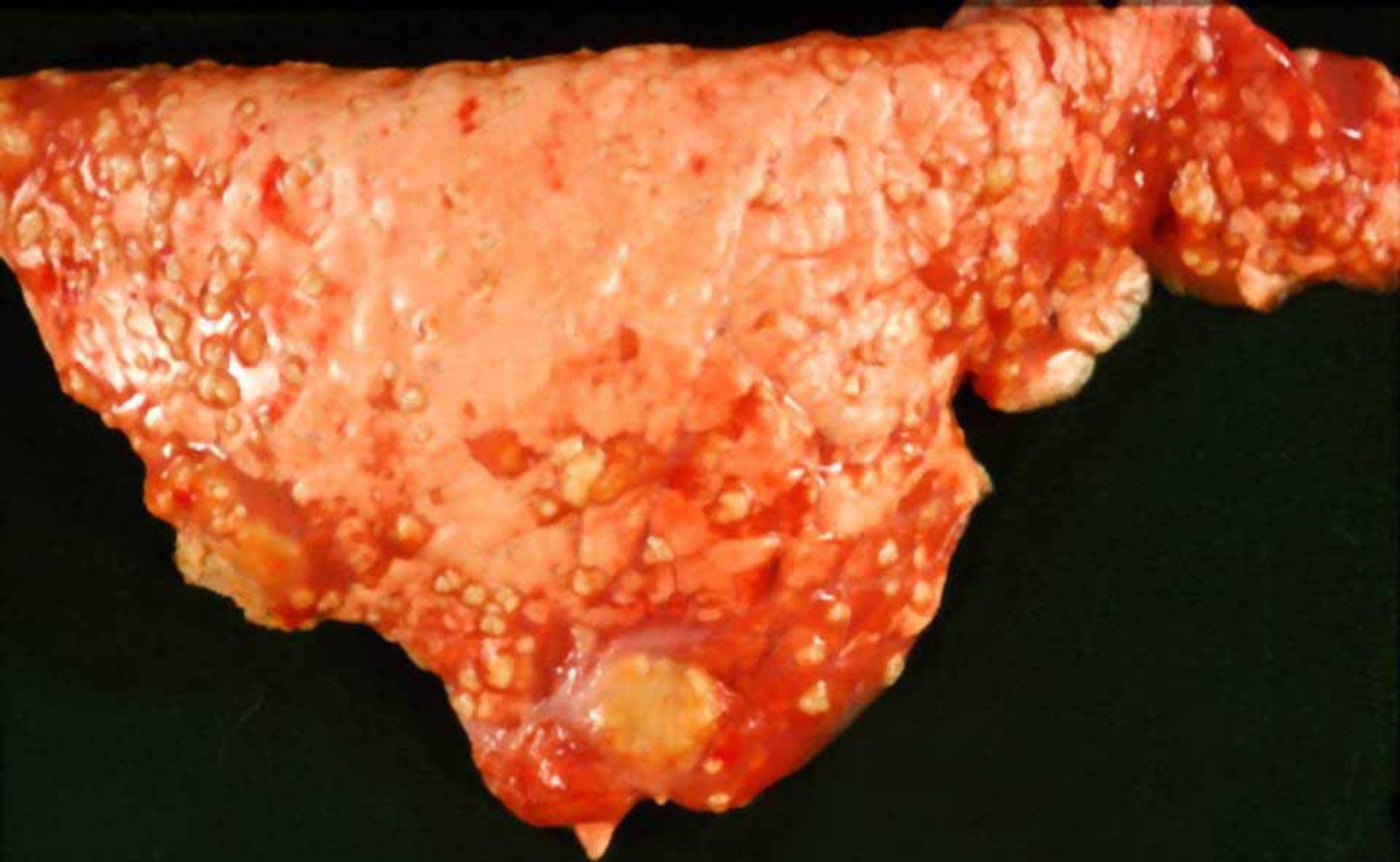


Actinobacillus suis

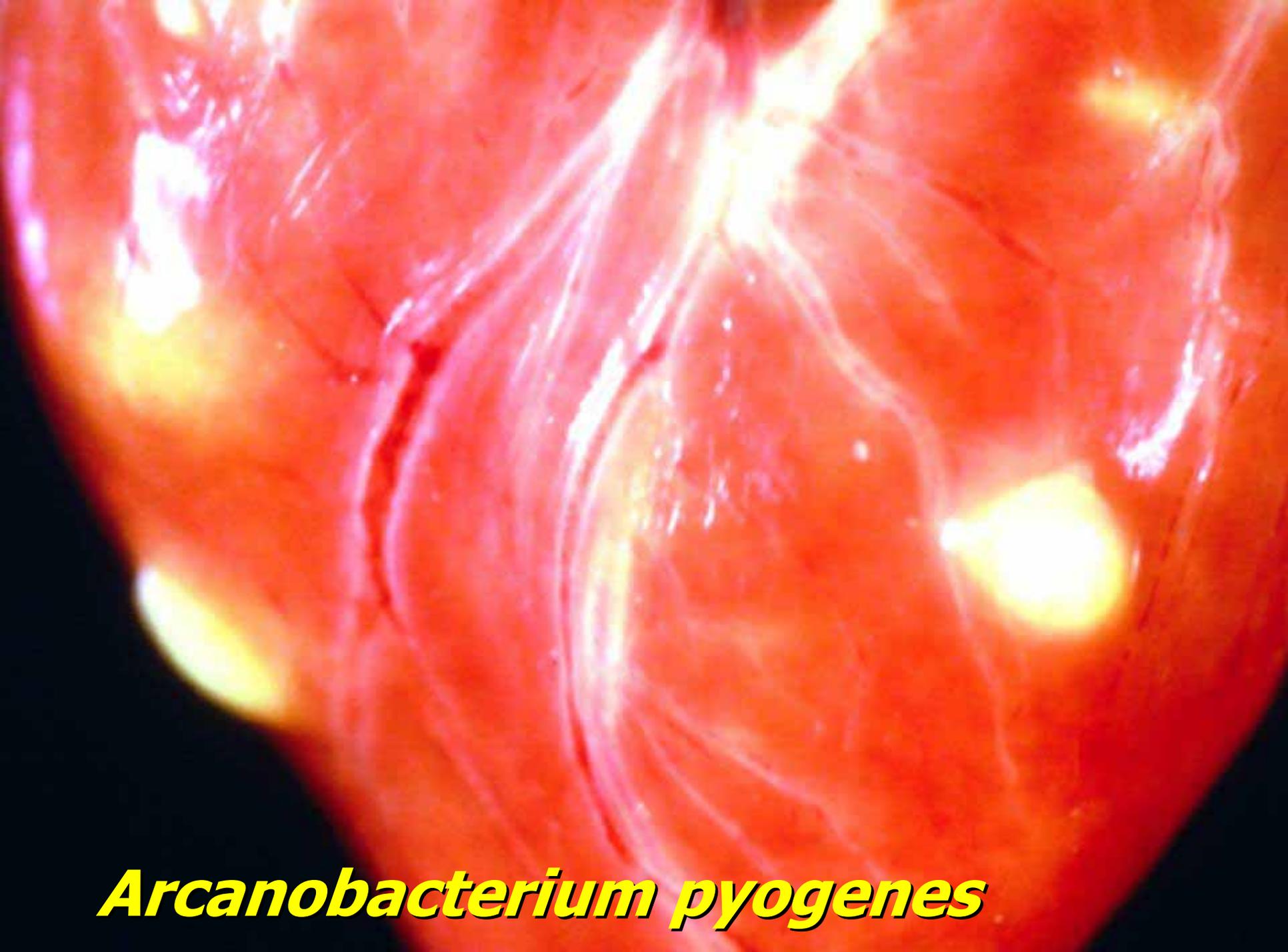
Liver

Actinomyces pyogenes

- Commensal of skin, upper respiratory and genital tracts of swine
- Secondary bronchopneumonia, abscesses
- Localized infections
 - bacteremia → abscesses
 - embolic abscessing pneumonia
- Diagnosis: culture



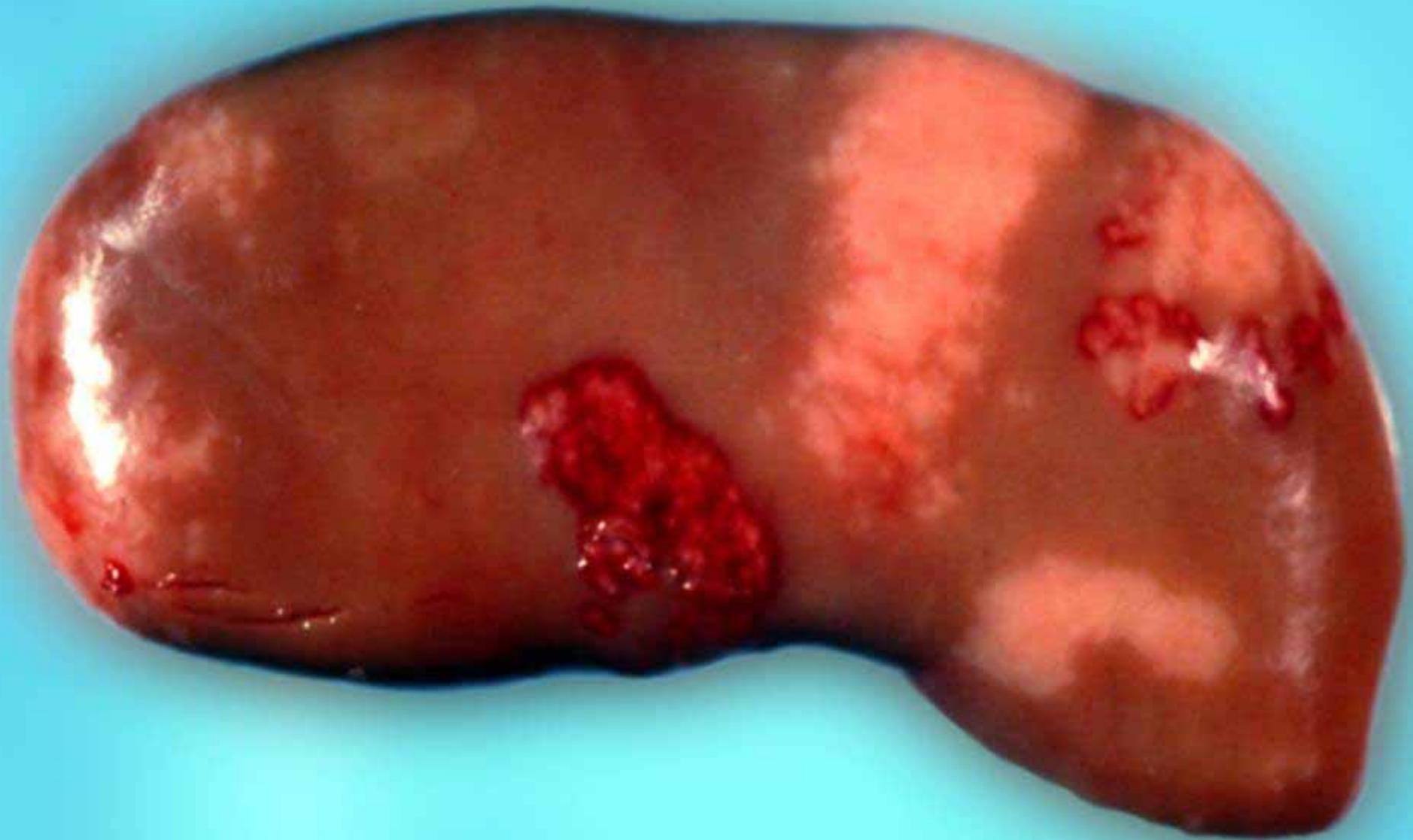
Arcanobacterium pyogenes



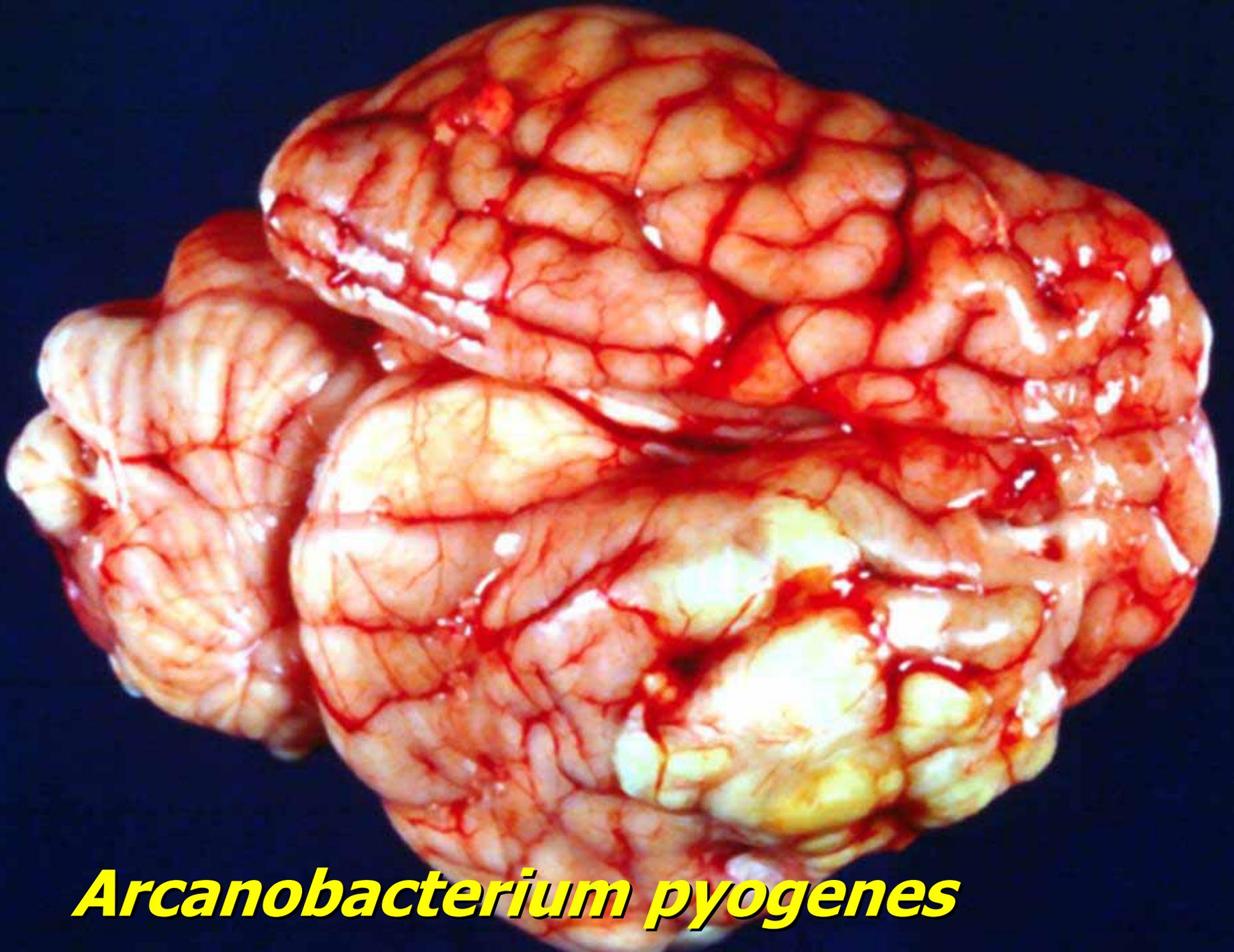
Arcanobacterium pyogenes



Arcanobacterium pyogenes



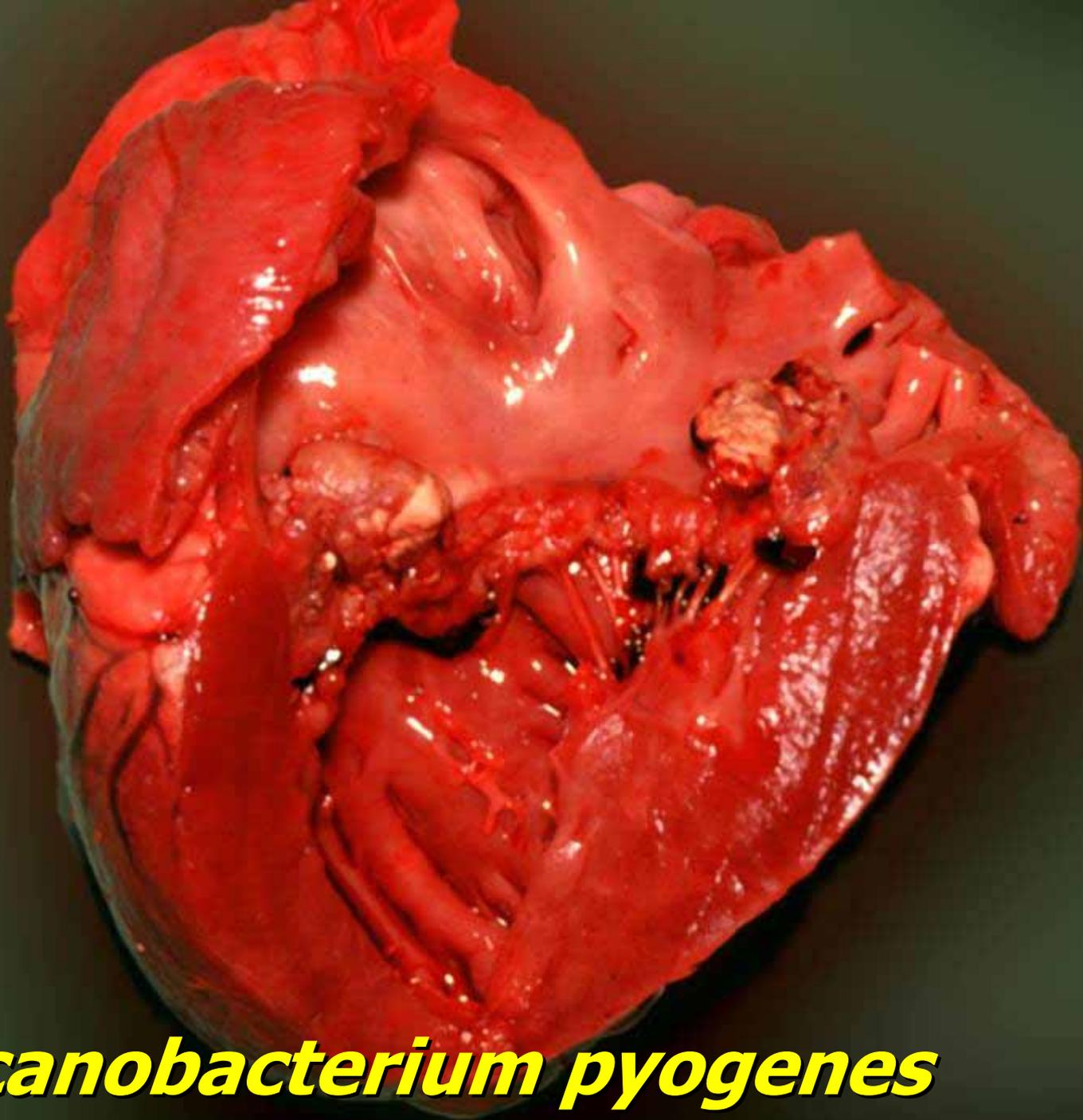
Arcanobacterium pyogenes



Arcanobacterium pyogenes



Arcanobacterium pyogenes



Arcanobacterium pyogenes



Pseudorabies

- **Passive antibody usually protects until 10-12 weeks of age**
- **Both nervous and respiratory clinical signs**
 - Tremors, head tilt, lateral recumbency
 - Sneezing, dyspnea, occasional coughing

Diagnosis of Pseudorabies

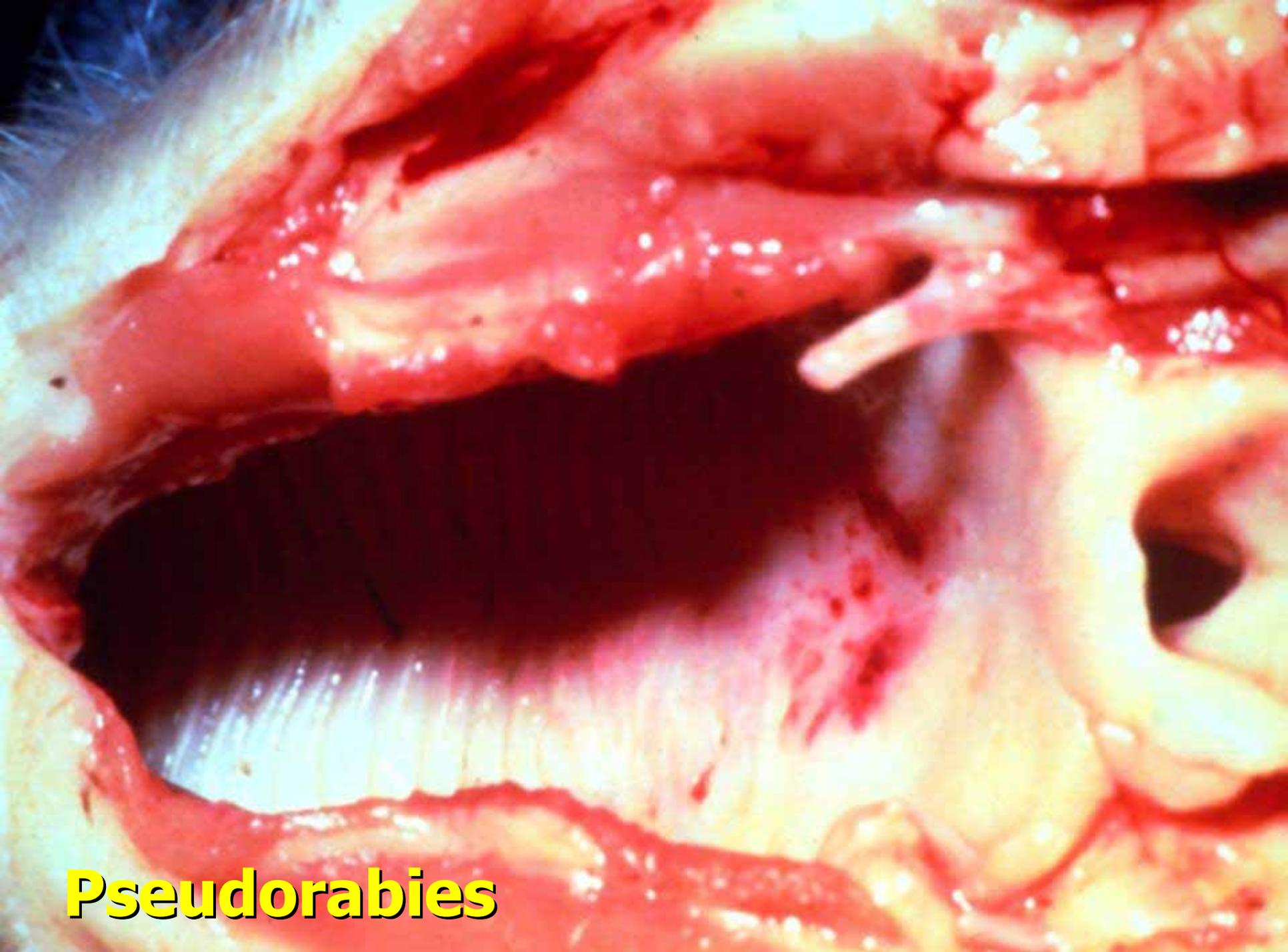
- Typical lesions
- Demonstration of PRV or viral antigen
 - FA tonsil
 - VI brain, spleen, lung
 - PCR autonomic ganglia
- Serology

Lesions of Pseudorabies

- **Gross**
 - Fibrinonecrotic rhinitis, laryngitis
 - Diffuse interstitial pneumonia
 - Tonsillar and hepatic necrosis
- **Microscopic**
 - Multifocal pulmonary parenchymal necrosis
 - Epithelial necrosis in airways, trachea, nasal cavity
 - Encephalitis



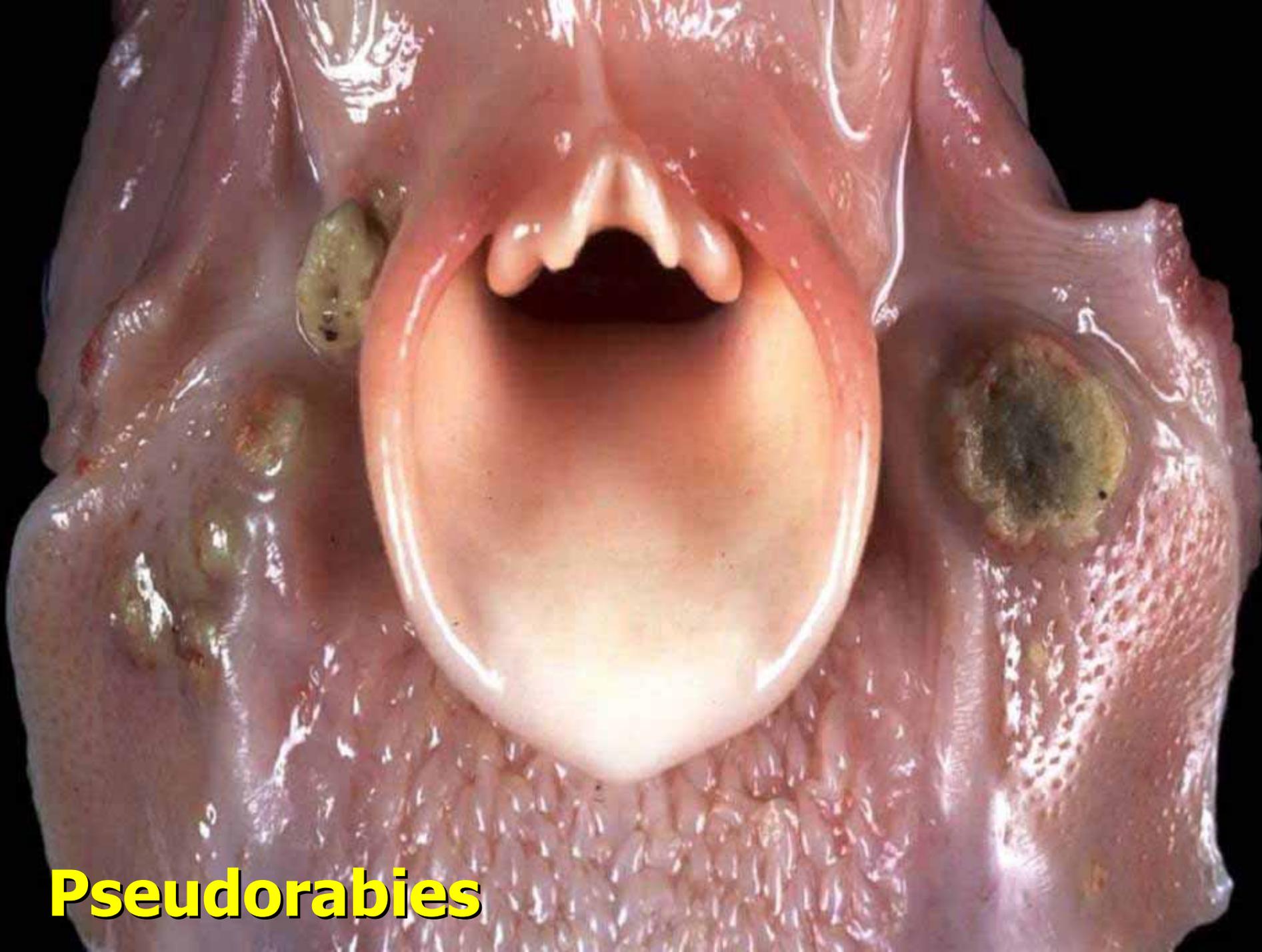
Pseudorabies



Pseudorabies



Pseudorabies



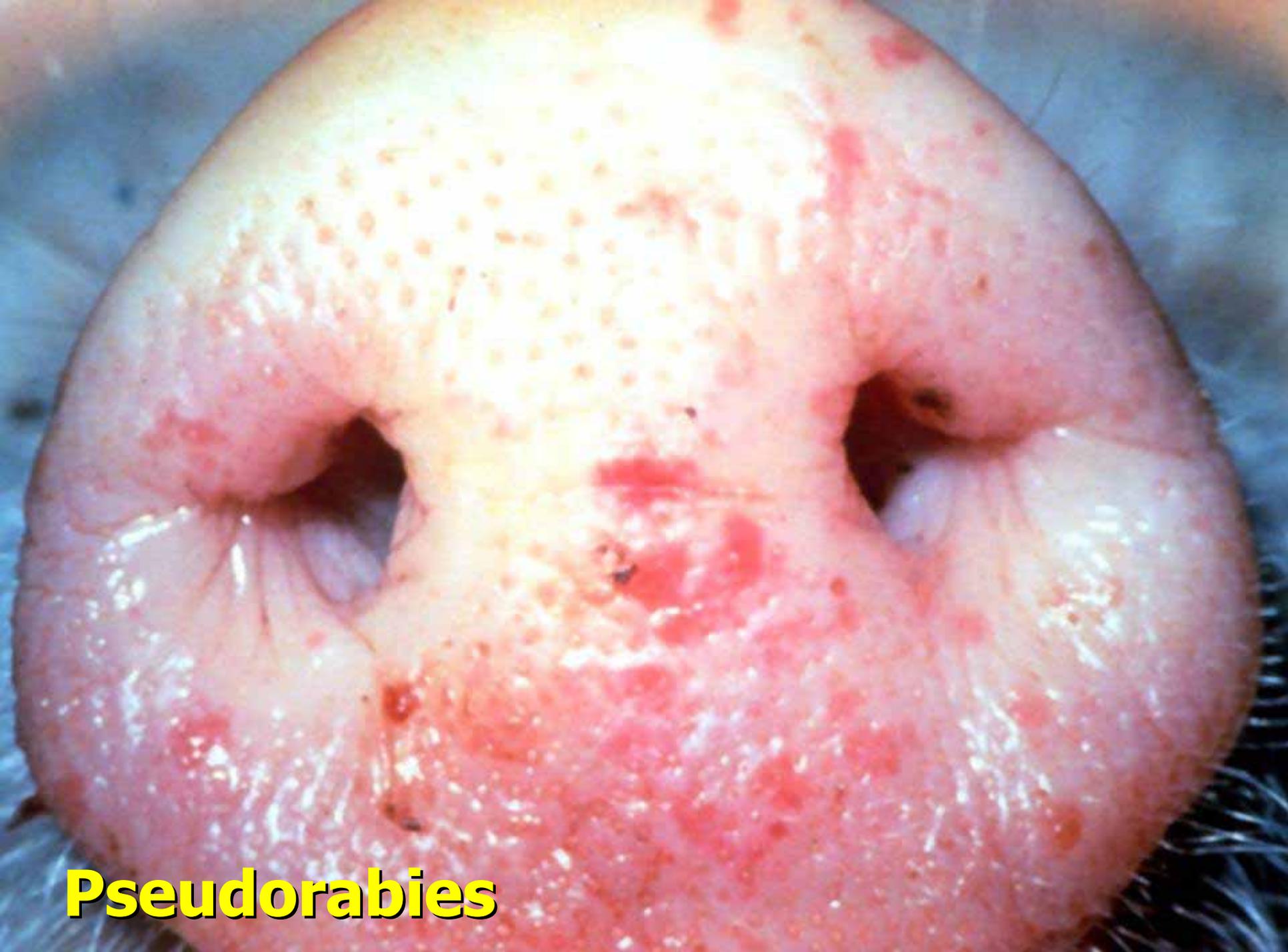
Pseudorabies



Pseudorabies



Pseudorabies



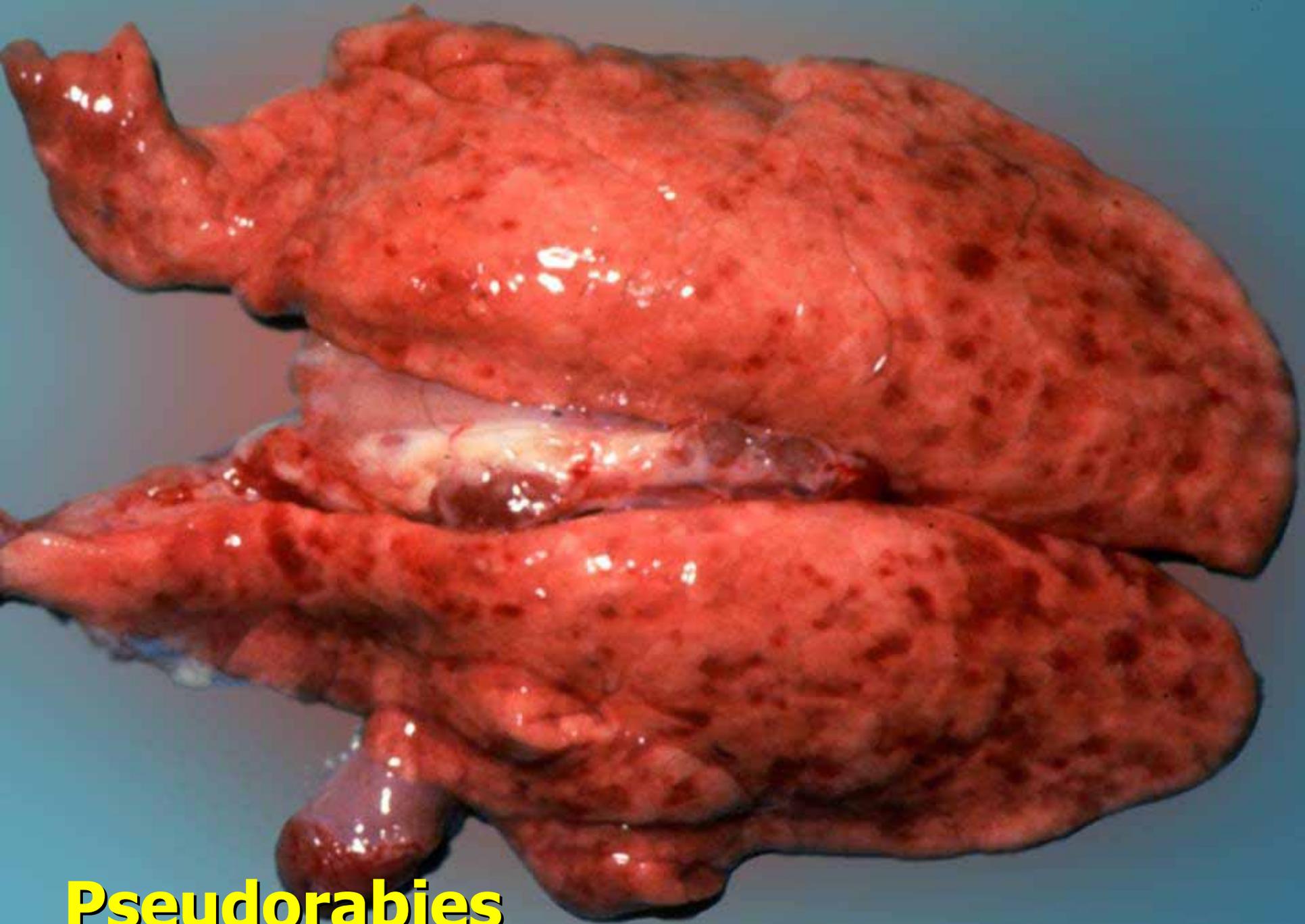
Pseudorabies



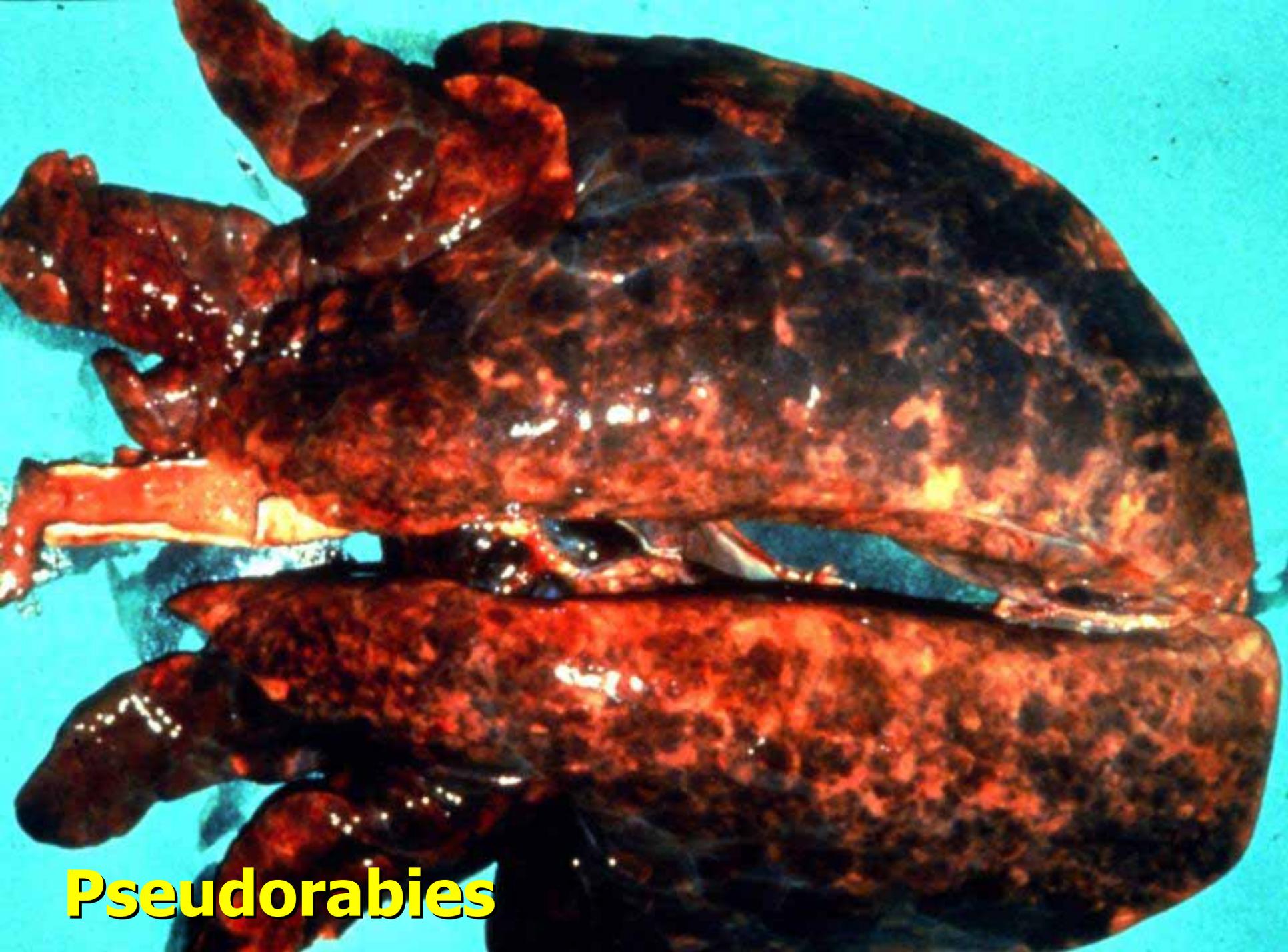
Pseudorabies



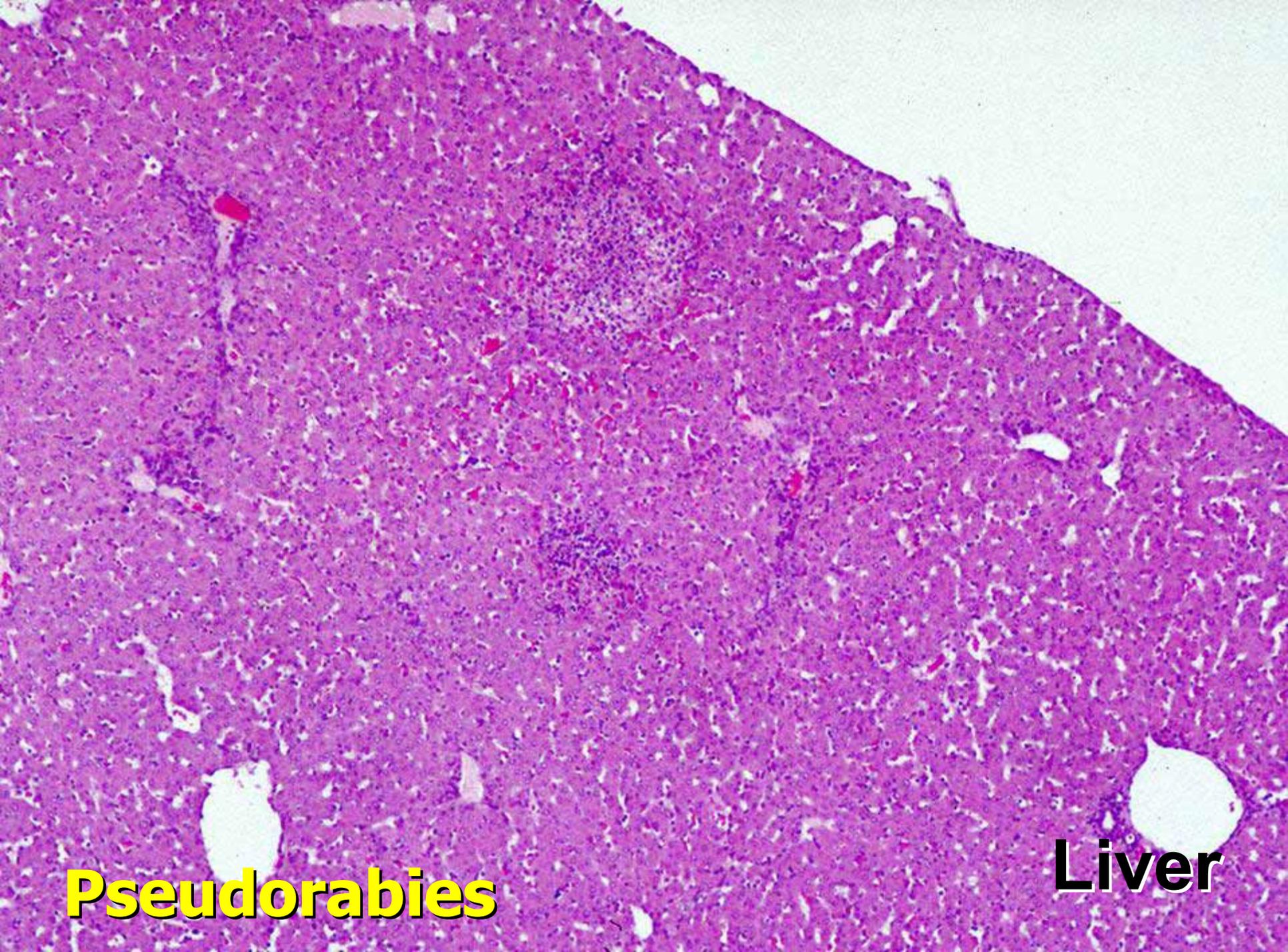
Pseudotumors



Pseudotubercles



Pseudorabies



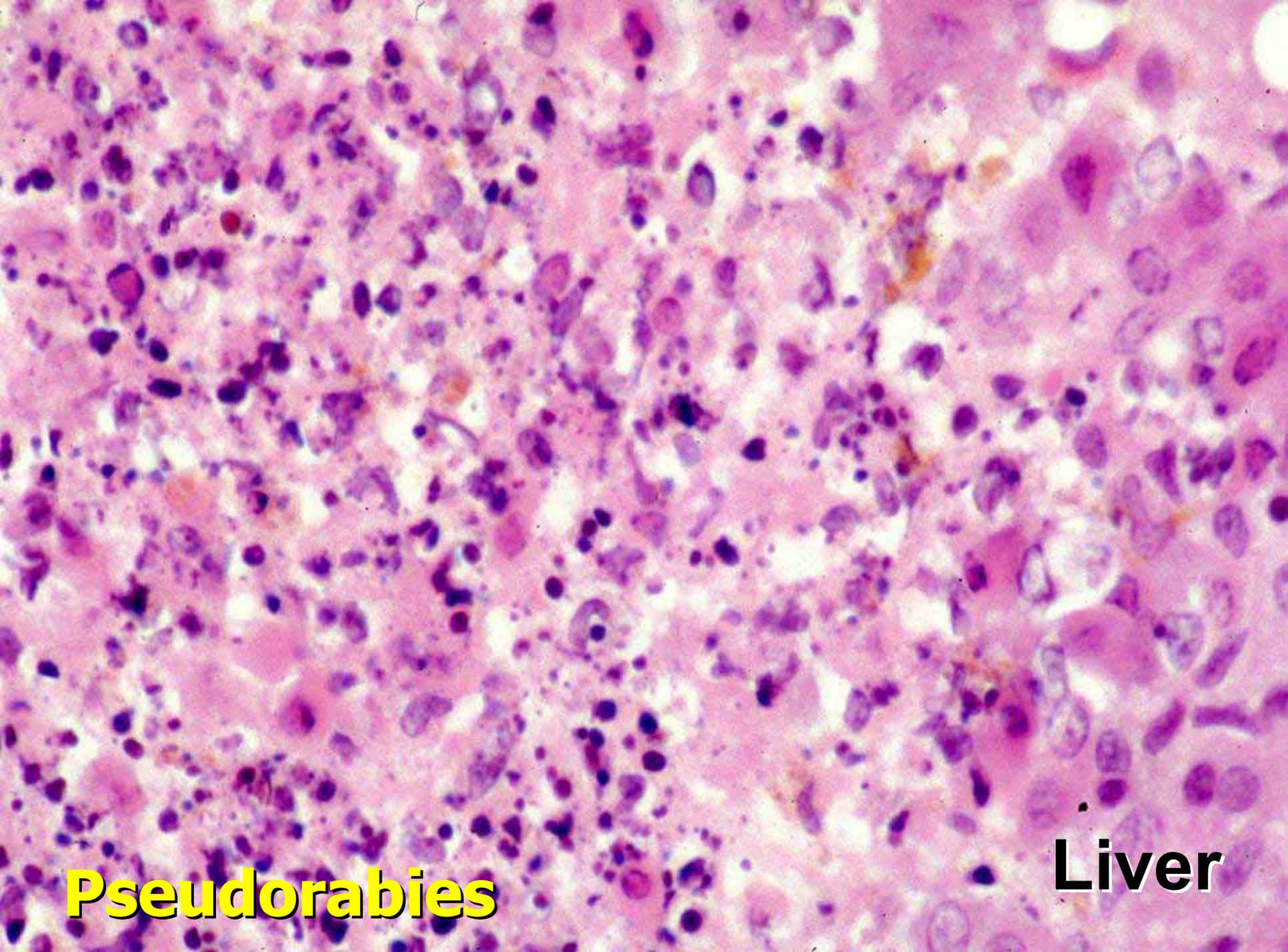
Pseudorabies

Liver



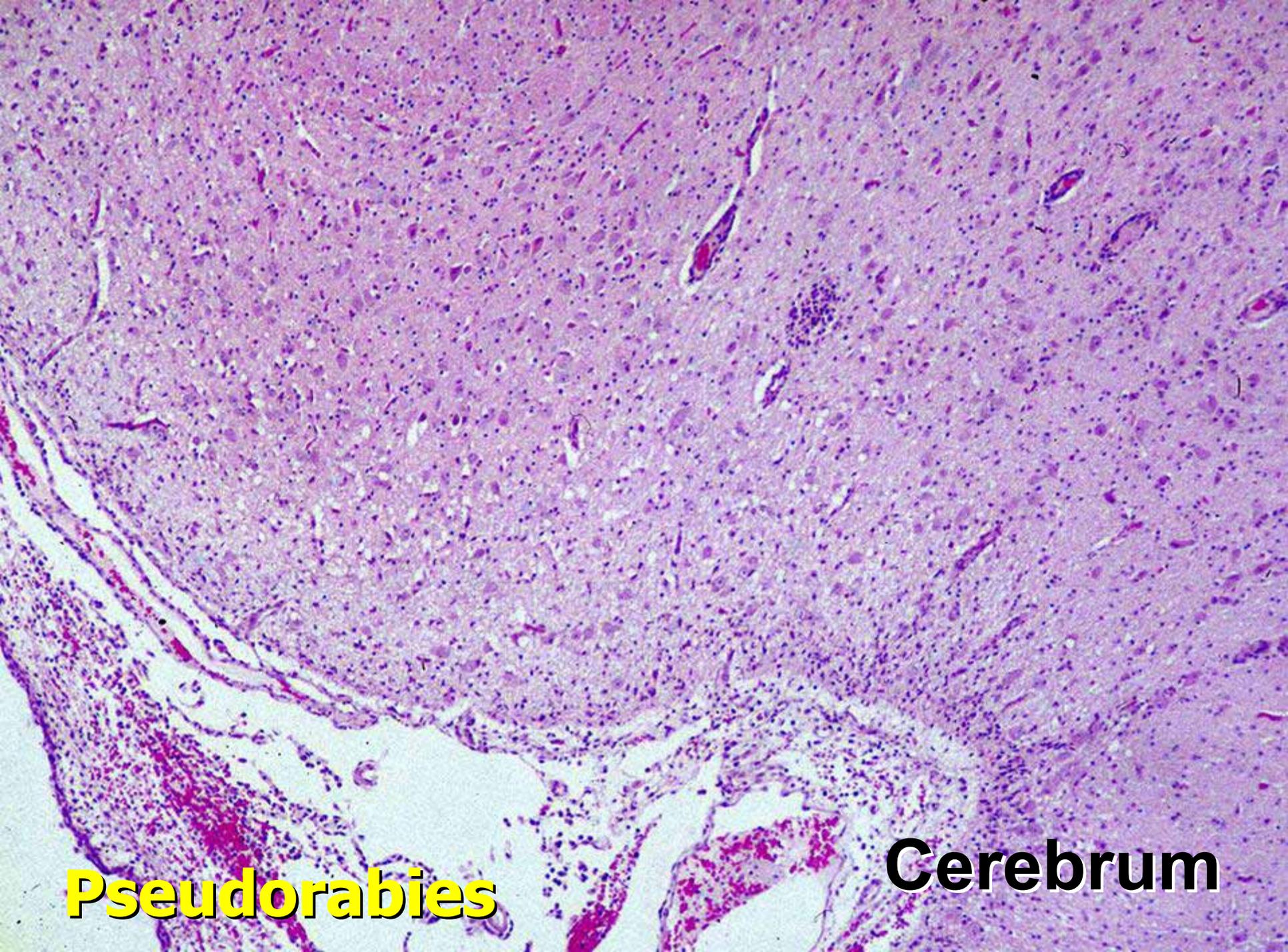
Pseudorabies

Liver



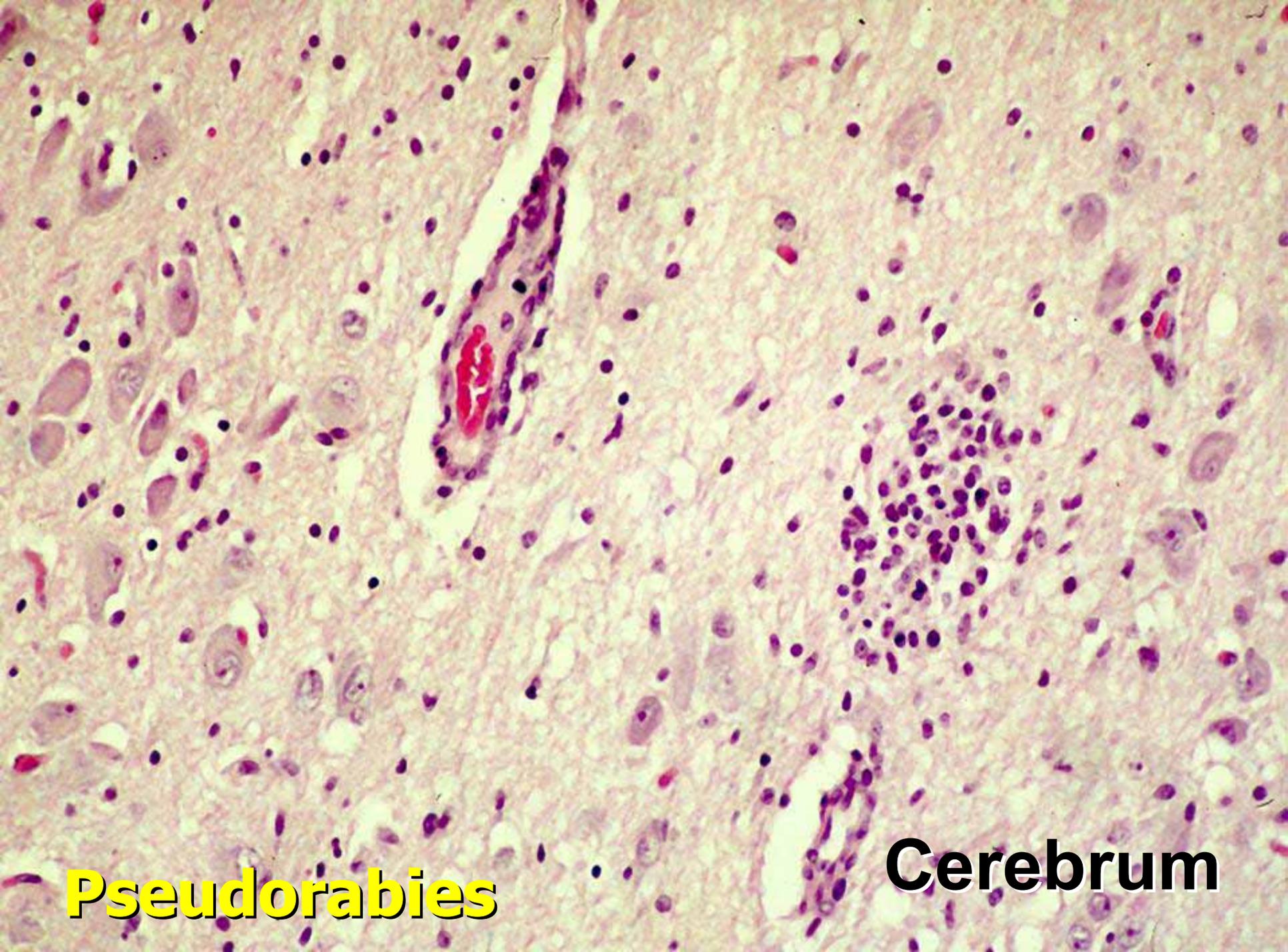
Pseudorabies

Liver



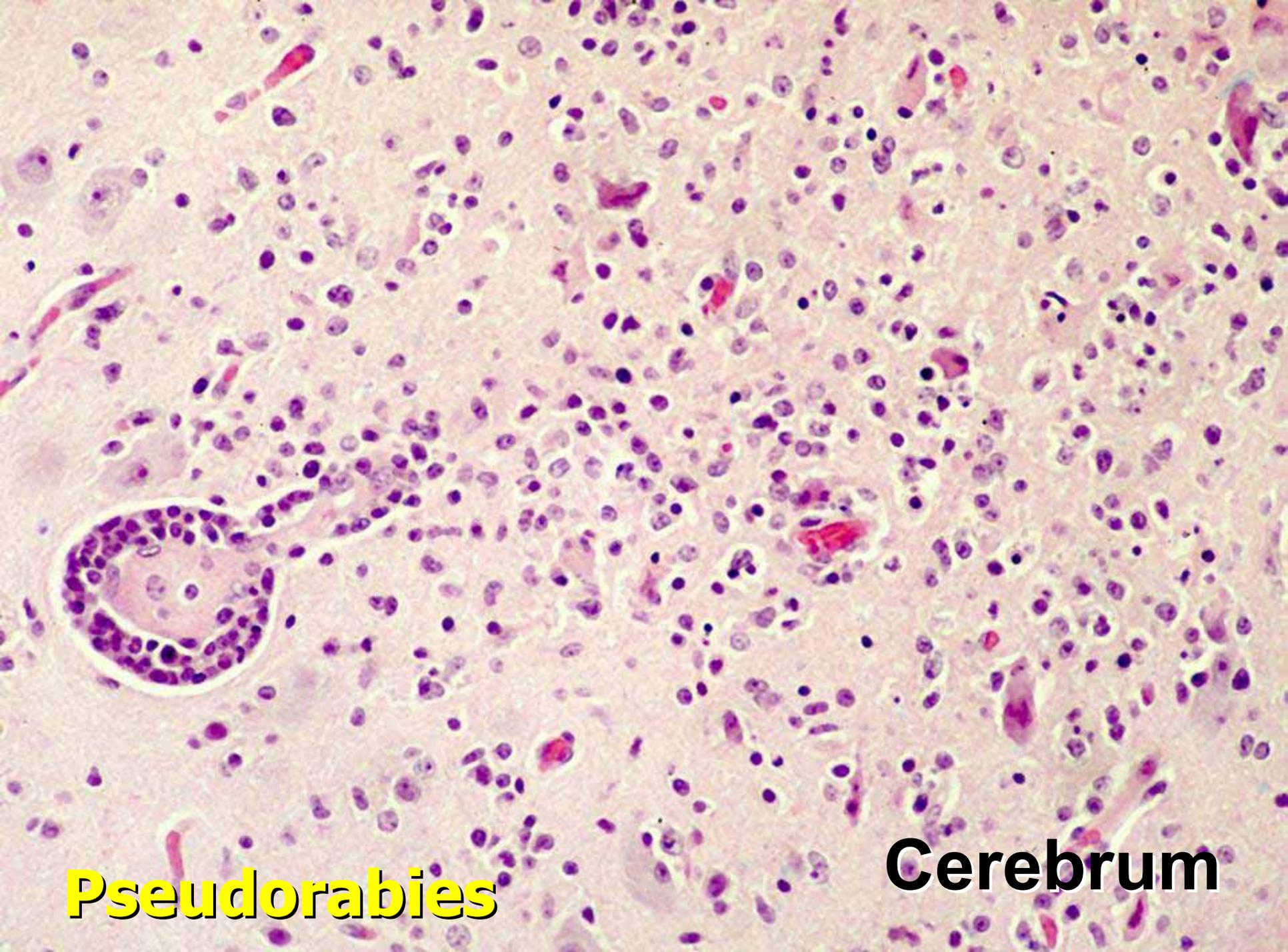
Pseudorabies

Cerebrum



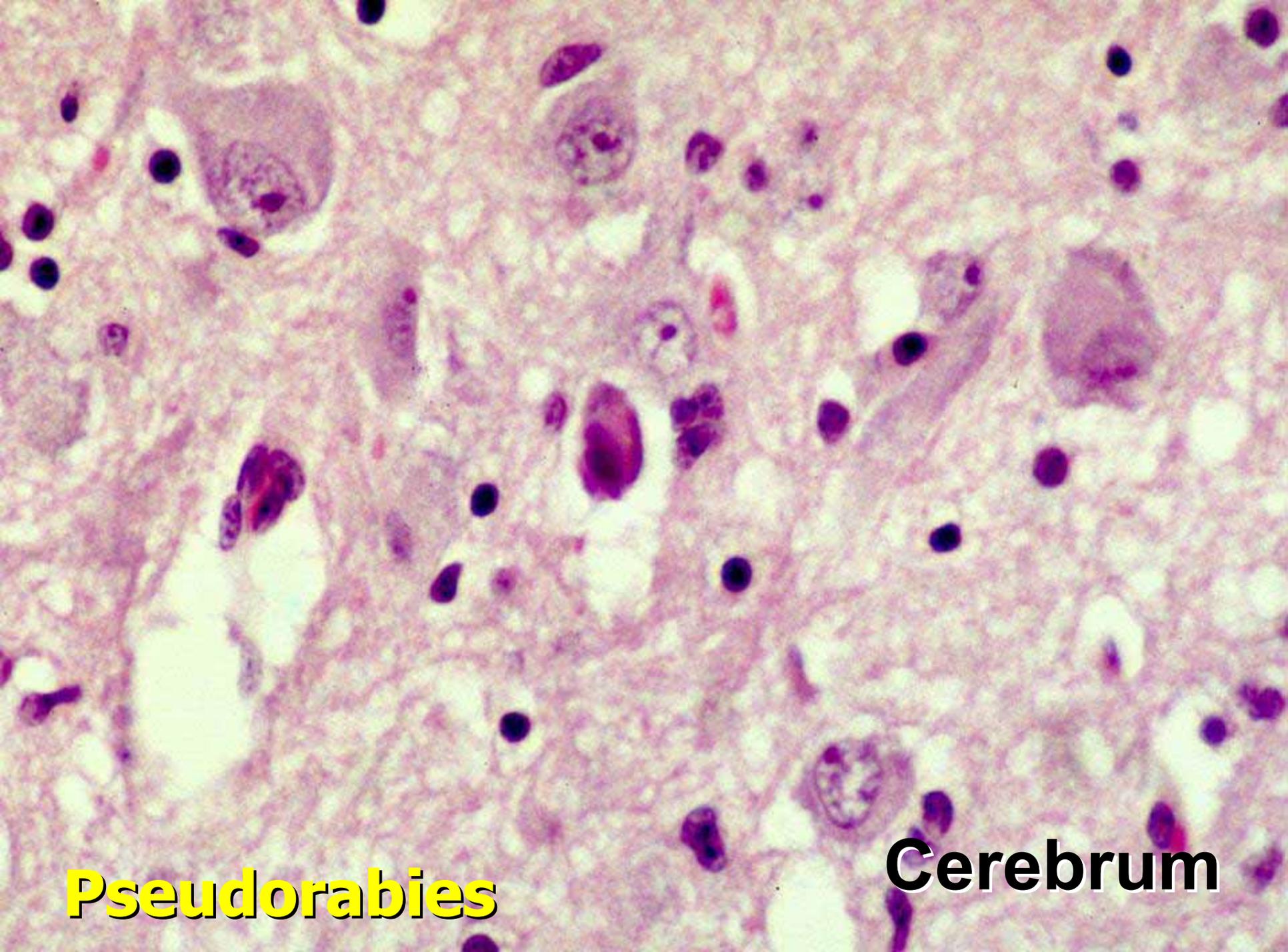
Pseudorabies

Cerebrum



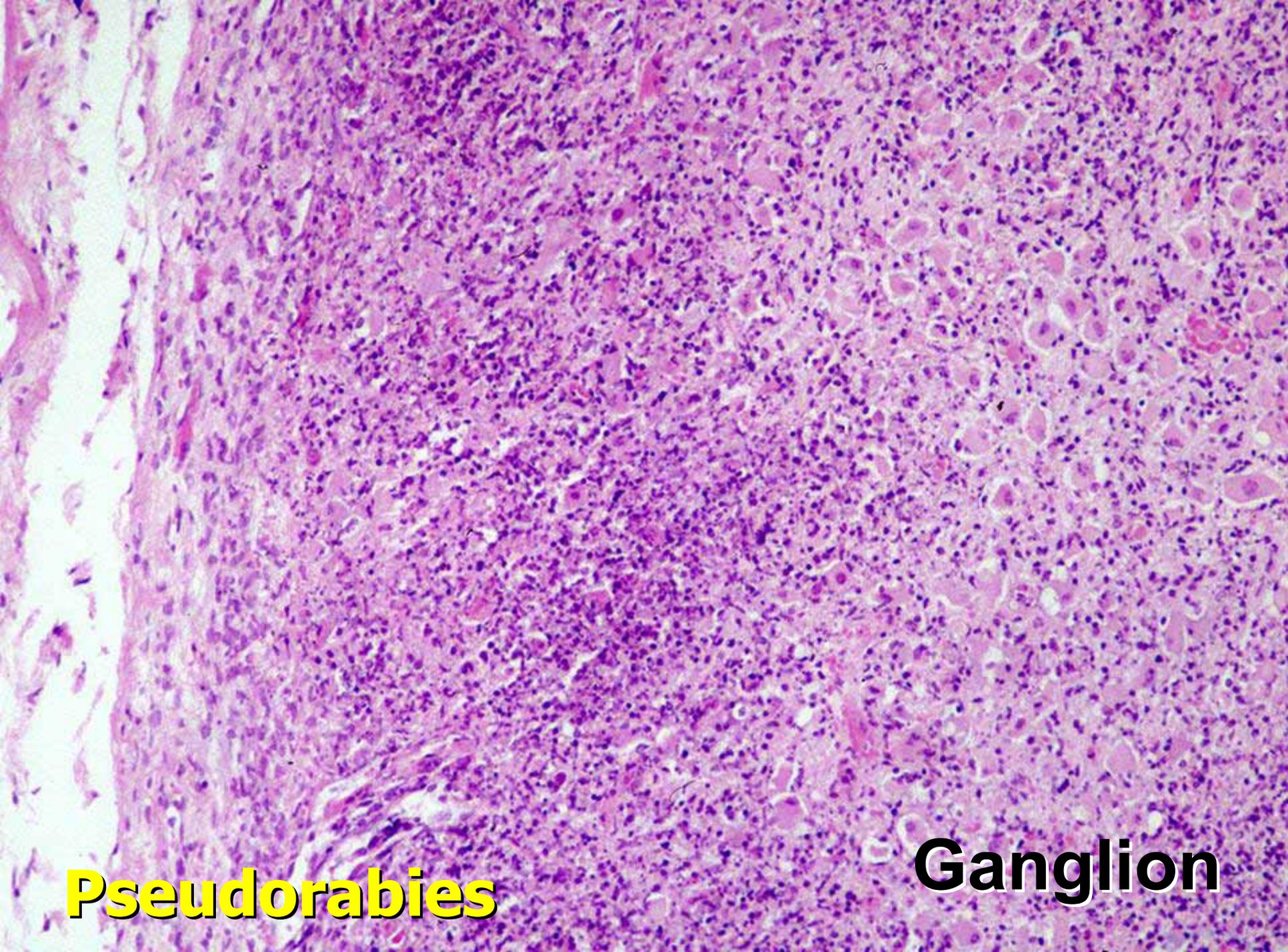
Pseudorabies

Cerebrum



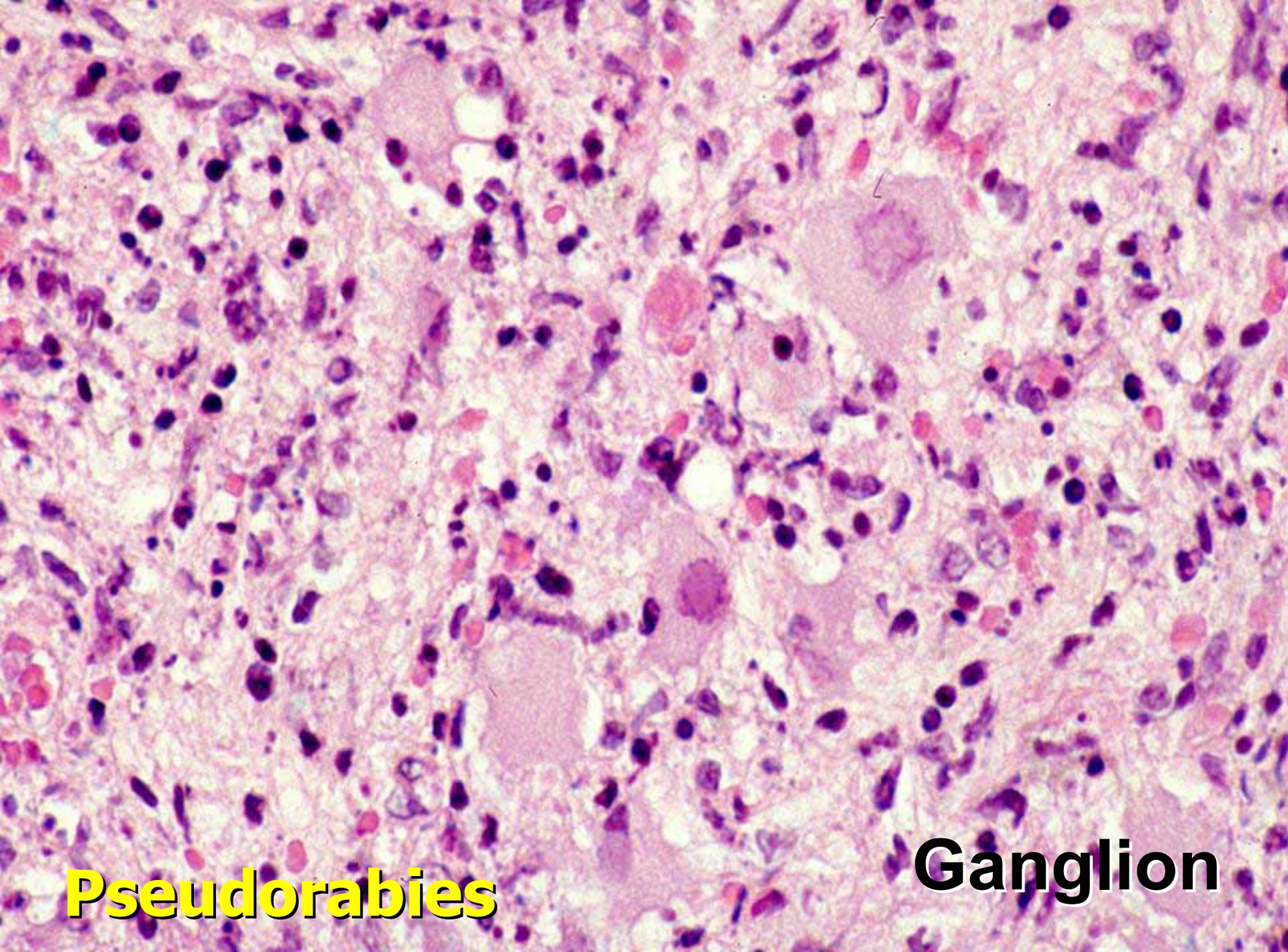
Pseudorabies

Cerebrum



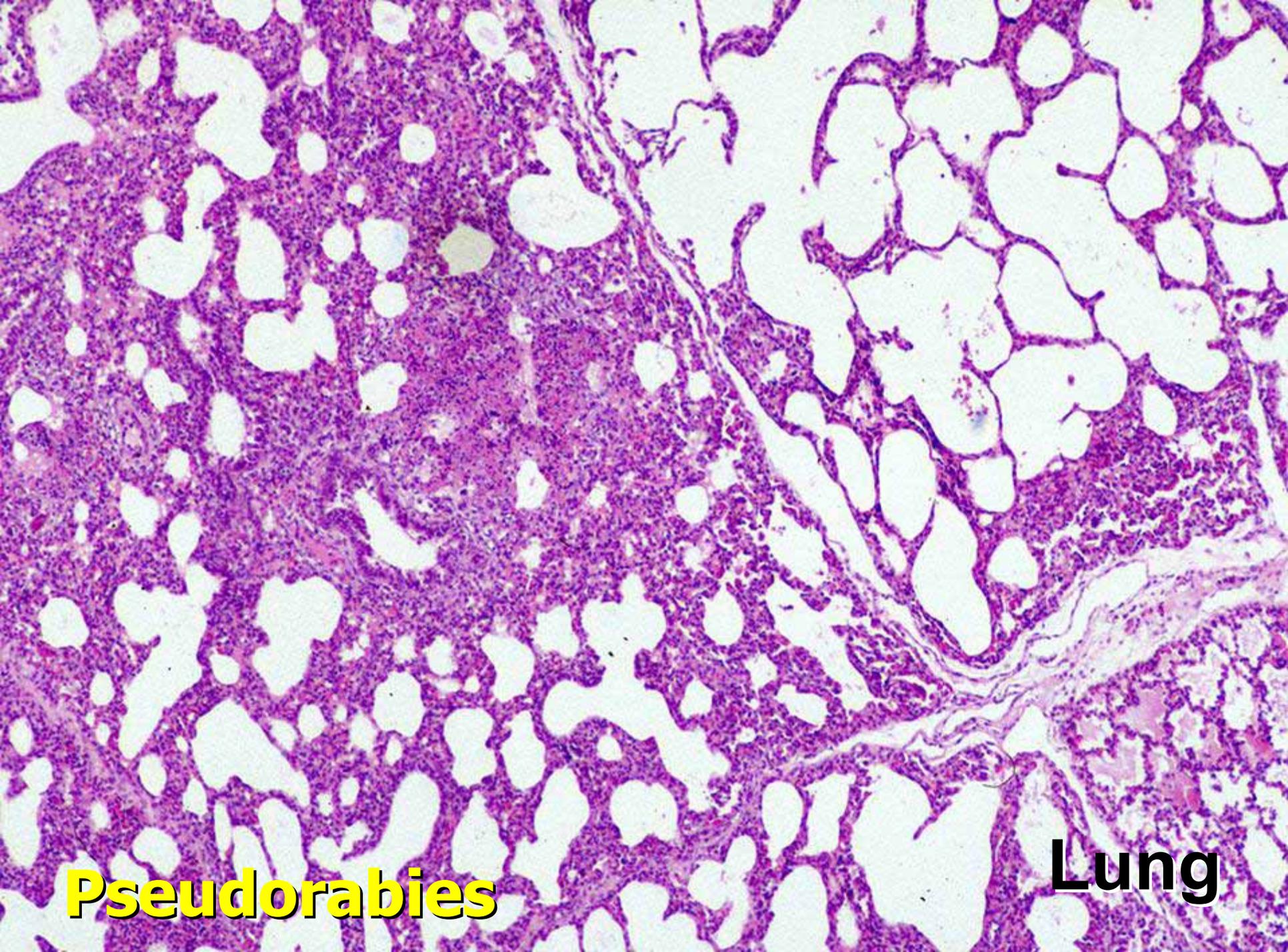
Pseudorabies

Ganglion



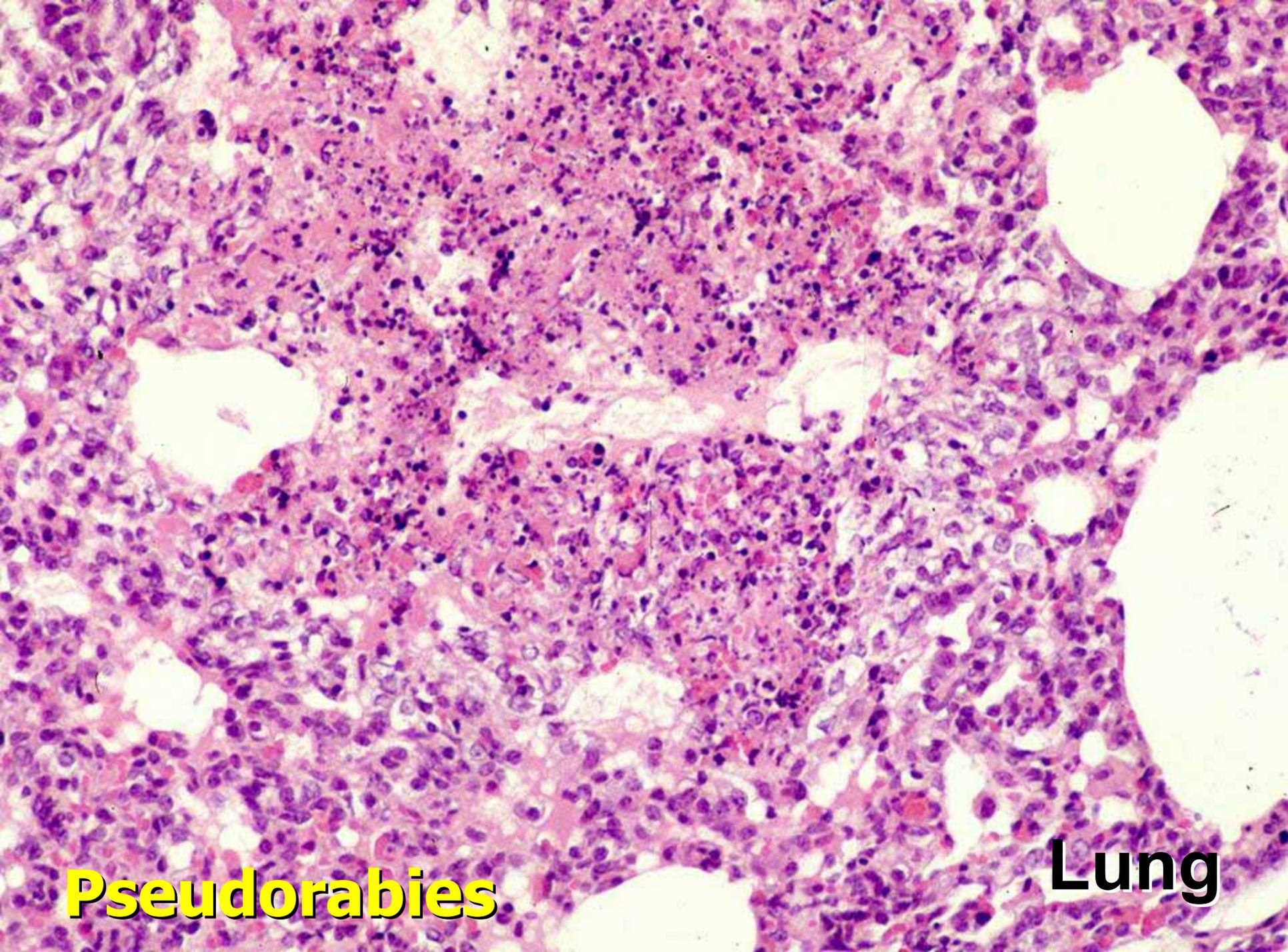
Pseudorabies

Ganglion



Pseudorabies

Lung



Pseudorabies

Lung



Porcine Respiratory and Reproductive Syndrome

- In late 1980's clinical outbreaks in US: mystery swine disease, similar disease in 90's in Europe
- Isolation of novel virus in 1991 in Europe and US
- Late term abortions (10%)
- Respiratory disease in finisher pigs
- Chronic PRRS (introducing naïve gilts into an infected herd): increased levels of stillborns, preweaning mortality, irregular return to estrus
- 1995: 23.5% of unvaccinated breeding pigs and 51.7% of finishers seropositive in US

Porcine Respiratory and Reproductive Syndrome

- Family Arteriviridae, order Nidovirales
- Genome of 15.1 to 15.5 kb, at least 8 ORFs
- Encodes nearly 20 mature proteins
- Classified into 2 major genotypes:
 - European type (type I, EU-type, Lelystad)
 - North American type (type II, NA-type, VR2332)
- Nonstructural protein 2 (Nsp2) and glycoprotein 5 (encoded by ORF5) are regarded as 2 regions of high heterogeneity that are involved in the pathogenicity of PRRSV strains

Porcine Respiratory and Reproductive Syndrome

- Infection through nasal mucosa, replication in nasal epithelium, macrophages, lymphocytes
- Viremia: begins 24 hrs, lasts 4-6 weeks (by VI)
- Serum antibodies after 7 days
- Spread to lungs, heart, tonsil, thymus, lymph nodes, spleen, intestine, kidney, liver, adrenal, brain, testes, placenta
- *In utero* infection: virus infected for 16+ weeks
- Interstitial pneumonia: begins 3 days, is most severe 7-10 days and resolves 14-21 days
- Dyspnea, sneezing, “drop-off”, other diseases such as polyserositis and meningitis

Transmission of PRRSV

- Shedding of virus in saliva, nasal secretions, urine, semen, mammary secretions, feces
- Not highly contagious
- Transmission through direct contact
- Introduction of infected pigs into herd
- Persistent infection critical in epidemiology
- Persistent viral infection of lymphoid tissue for more than 157 days: clinically healthy
- Area spread only over short distances
- Ducks may be viral reservoir

Diagnosis of PRRS

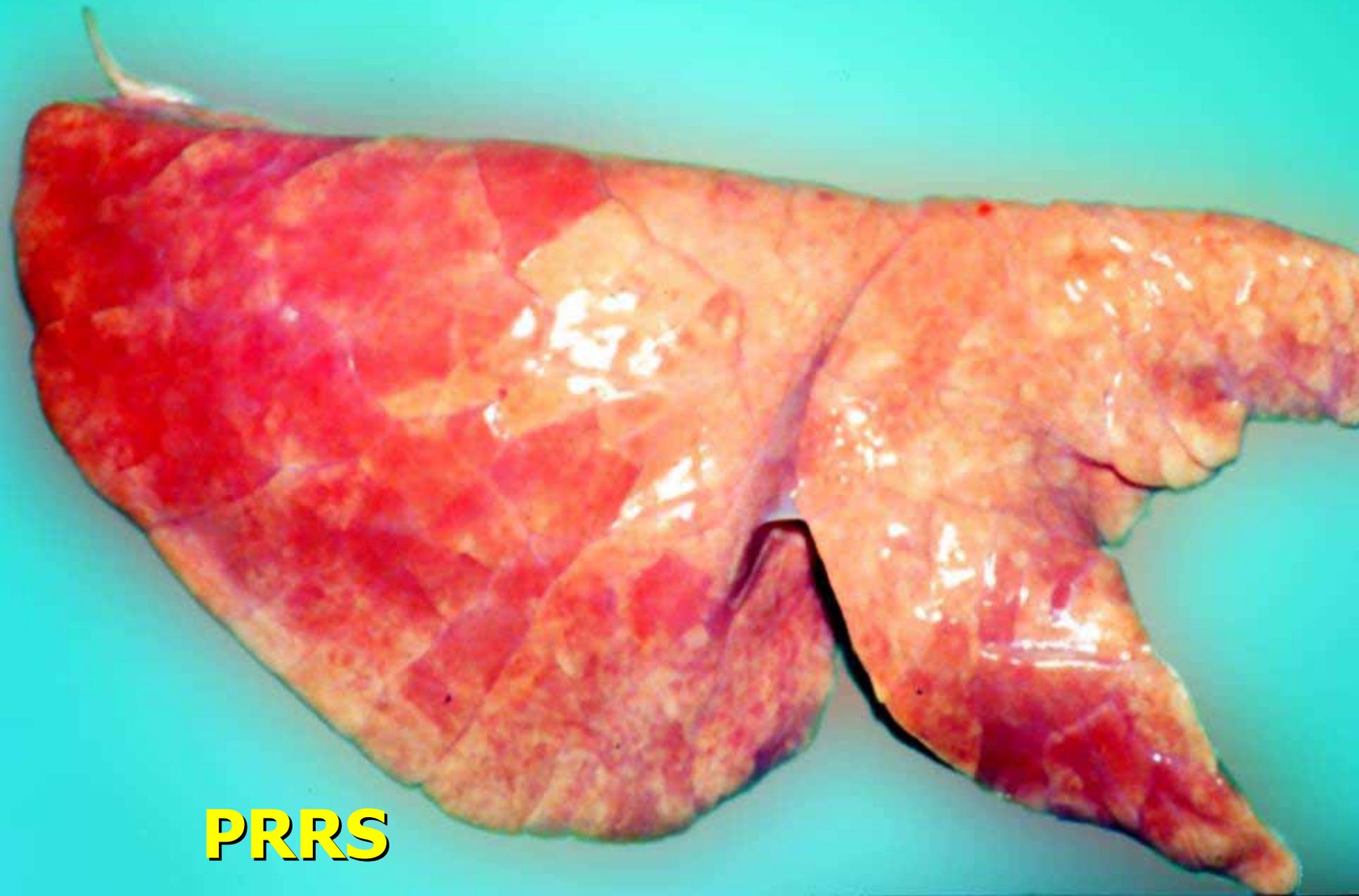
- **Typical lesions**
- **Demonstration of PRRSV or antigens**
 - VI serum, lung, spleen
 - IHC lung, tonsil
 - RT-PCR
- **Serology**
 - ELISA
- **Strain differentiation**
 - Sequencing, ORF 4-5

PRRSV Induced Lesions

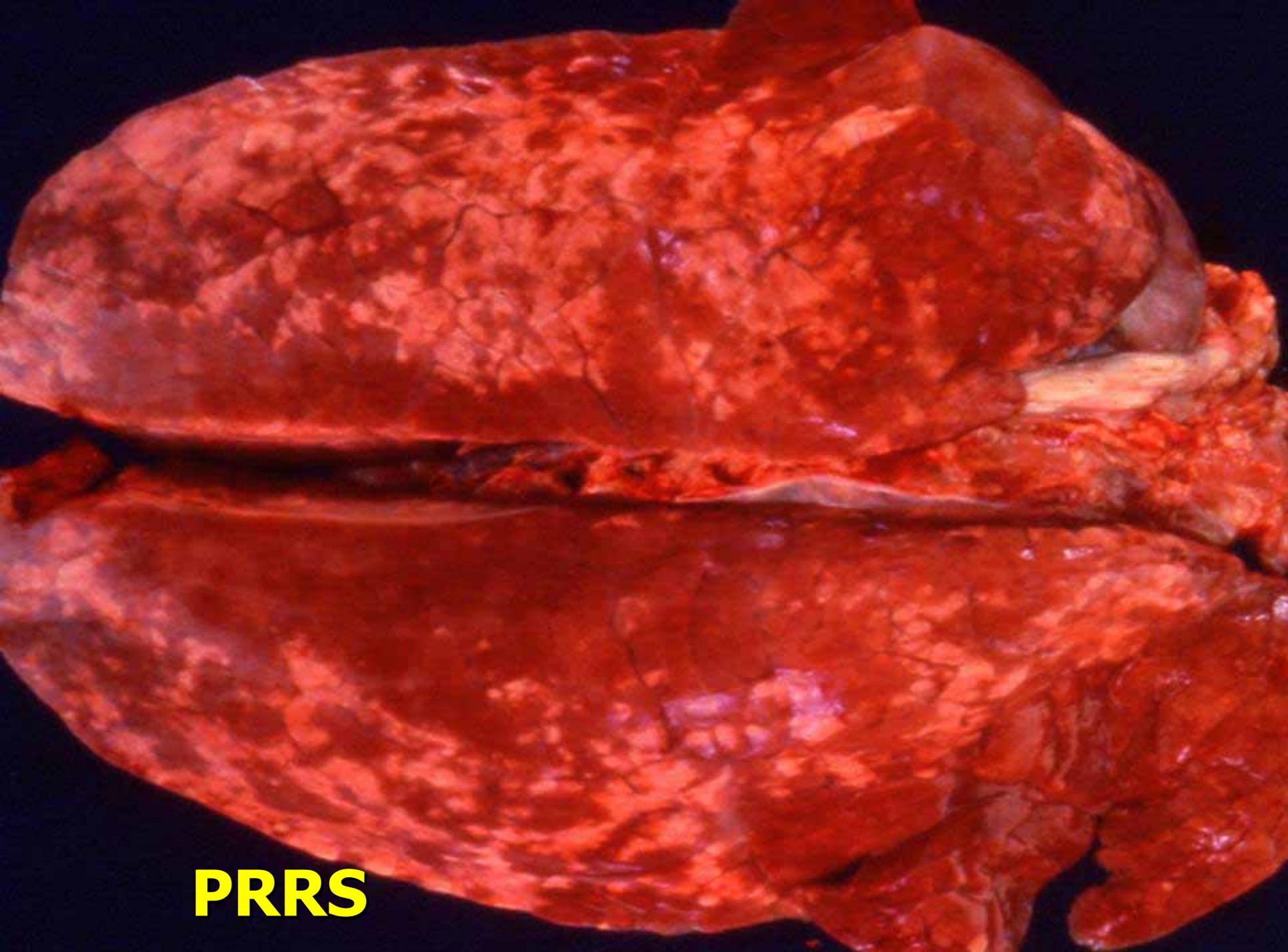
- **Gross lesions**
 - **Interstitial pneumonia: variable appearance**
 - **Enlarged lymph nodes after 5 days**
- **Microscopic lesions**
 - **Interstitial pneumonia +/- necrotic macrophages in alveoli**
 - **No necrosis of airway epithelium**
 - **Lymphoid necrosis - hyperplasia**
 - **Nonsuppurative myocarditis and encephalitis**



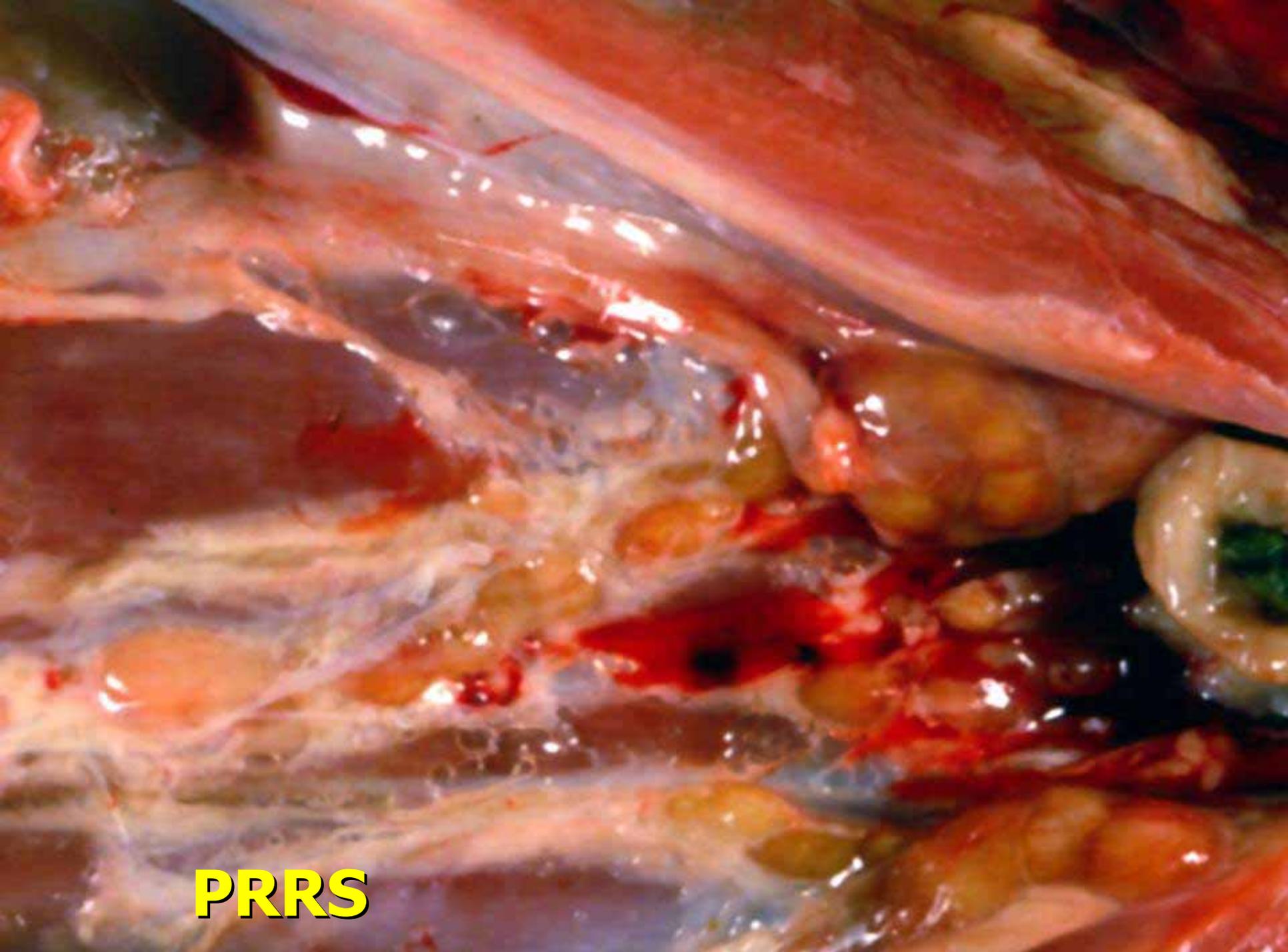
PRRS



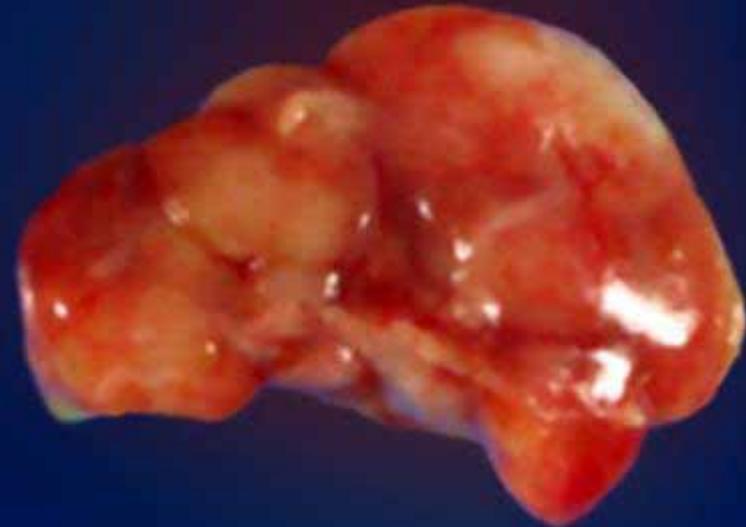
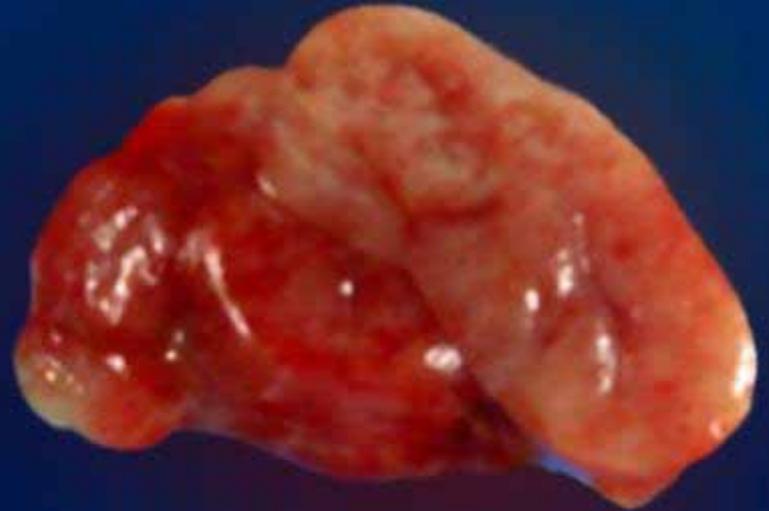
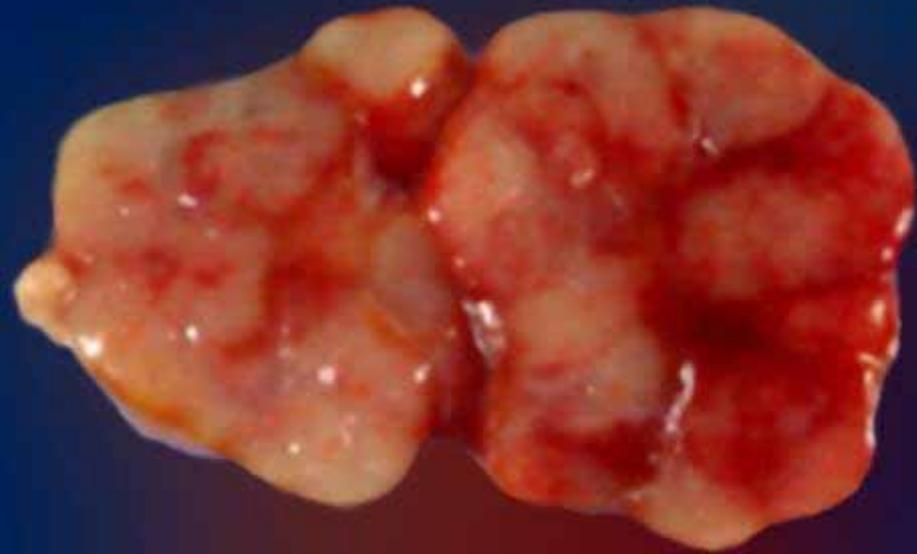
PRRS



PRRS



PRRS



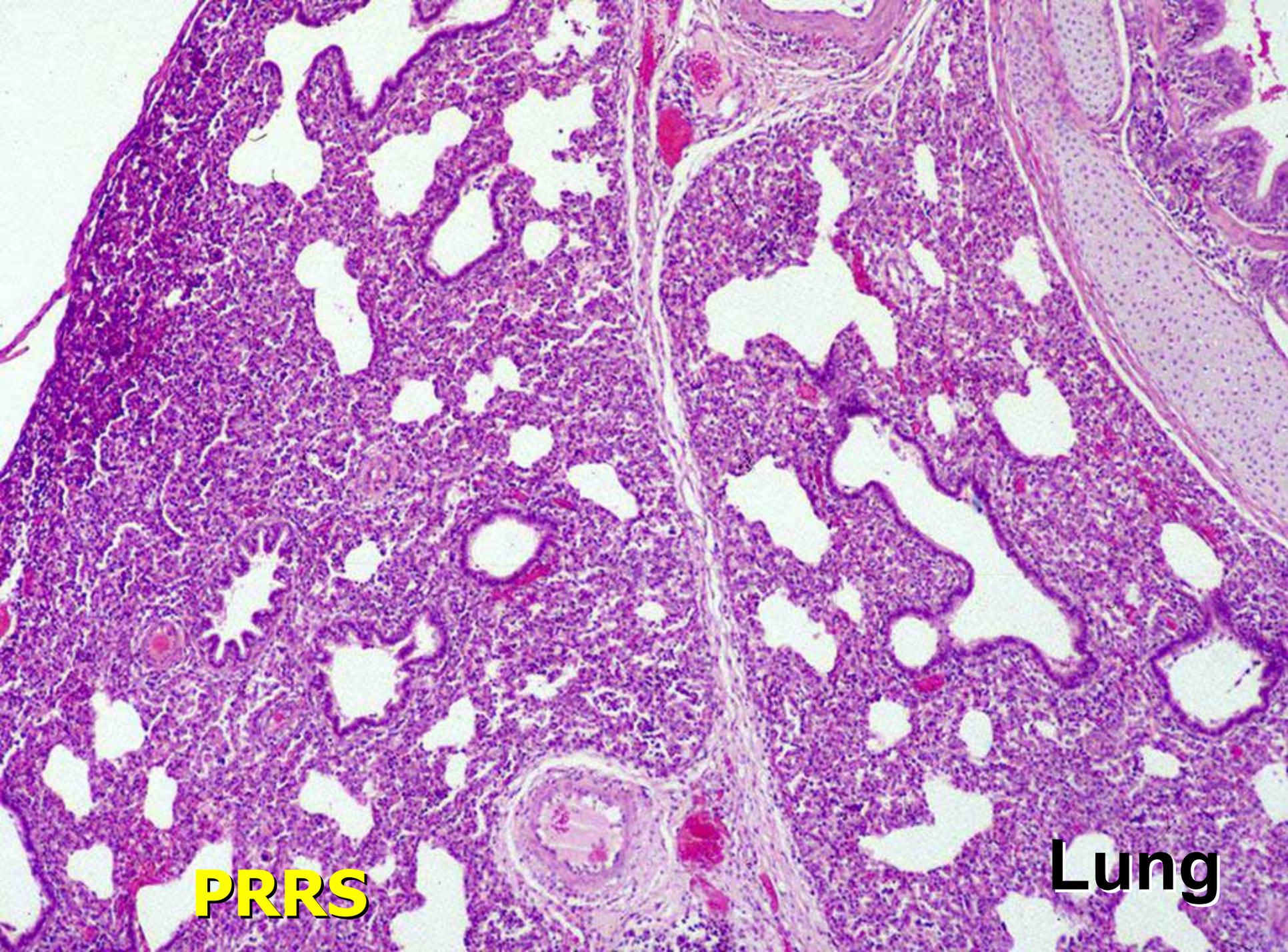
PRRS



PRRS

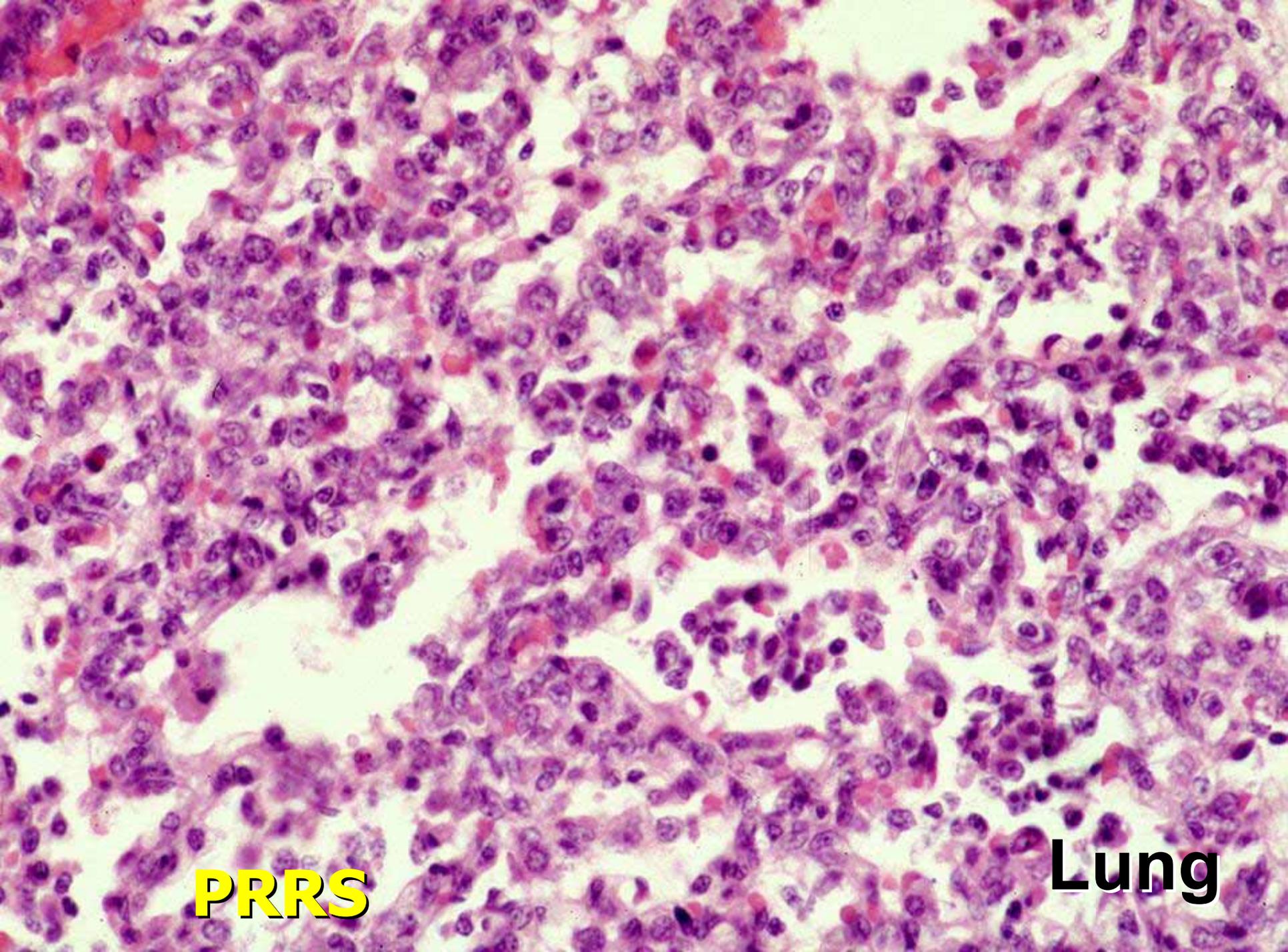


PRRS



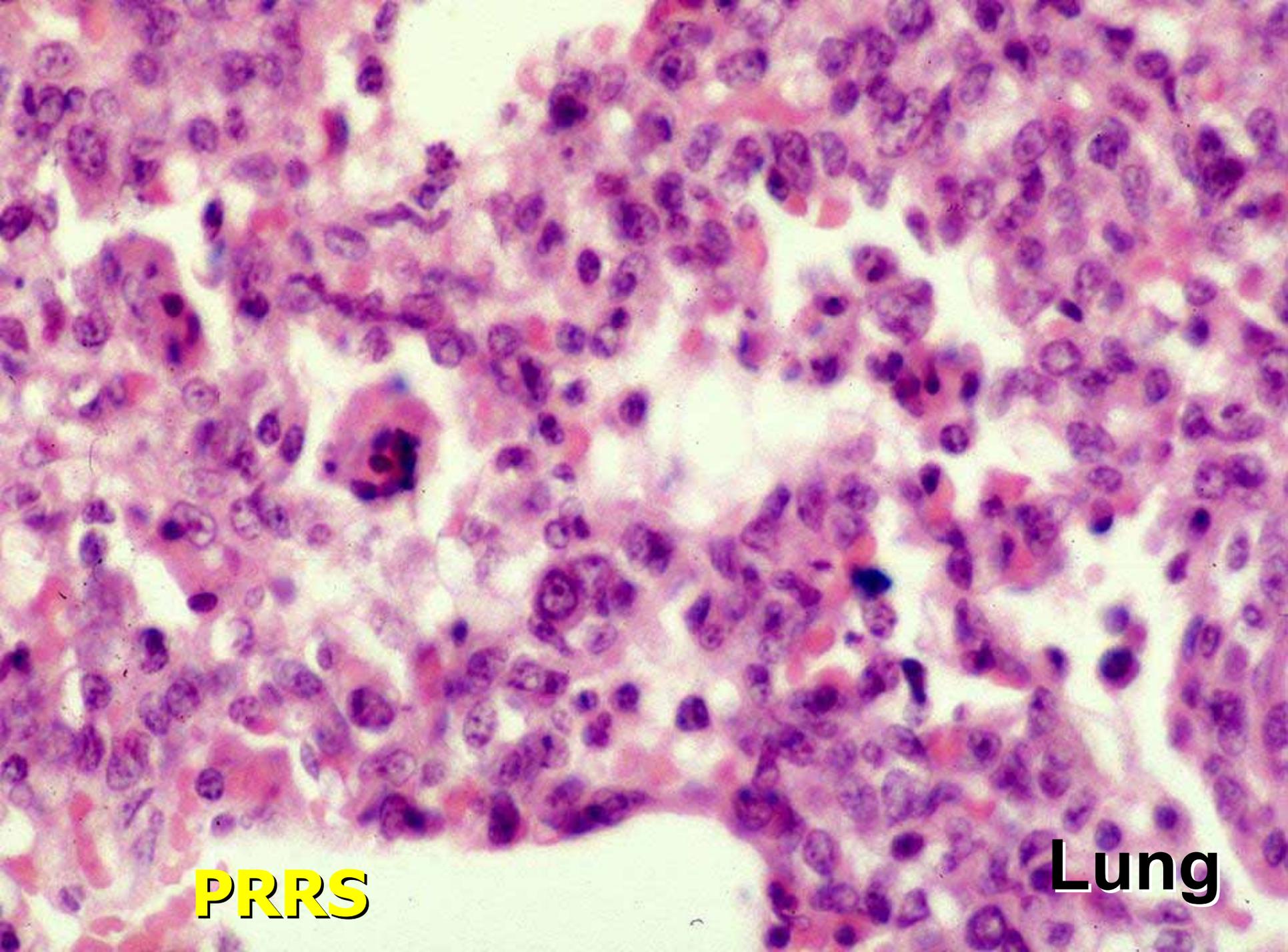
PRRS

Lung



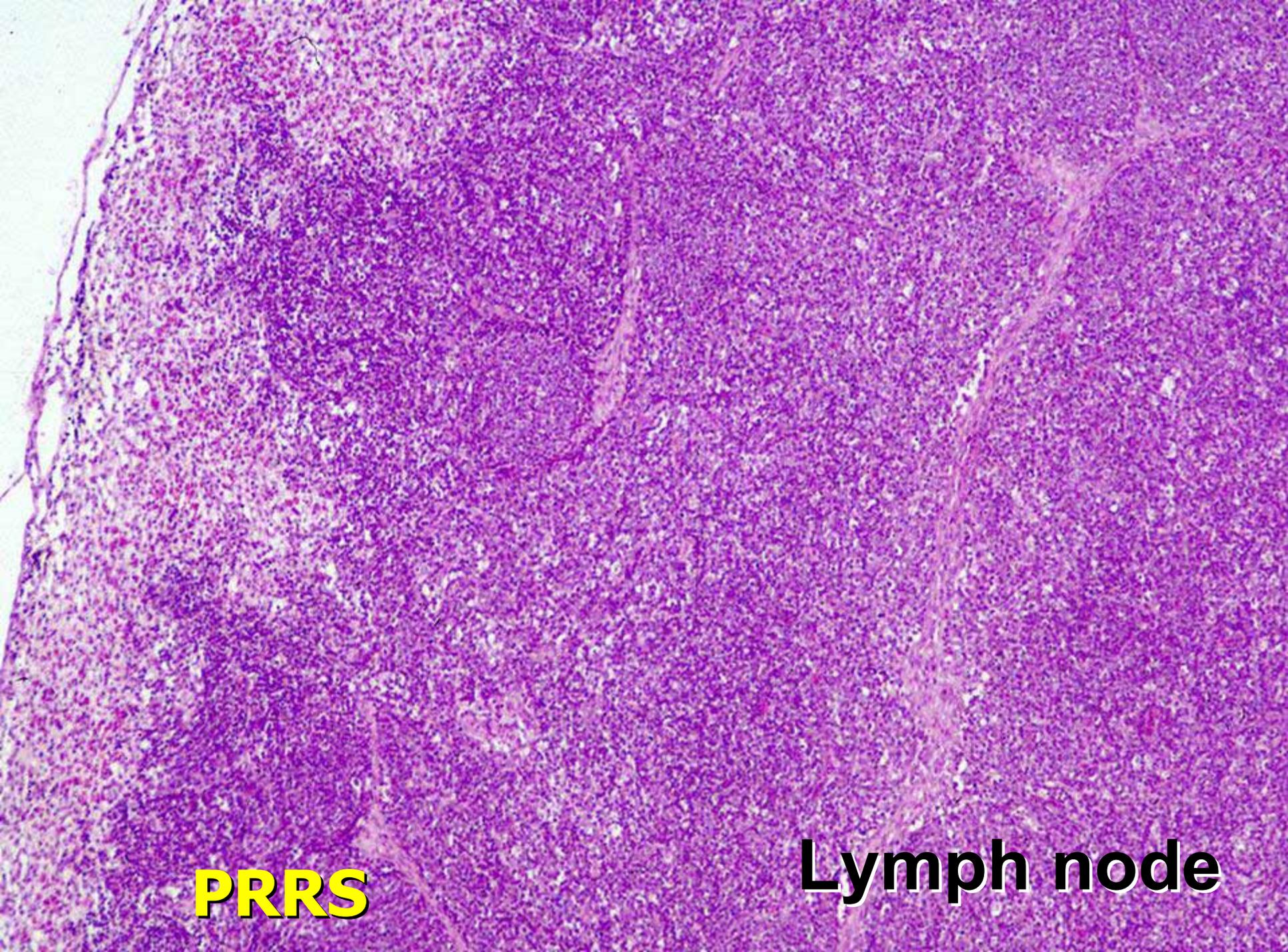
PRRS

Lung



PRRS

Lung



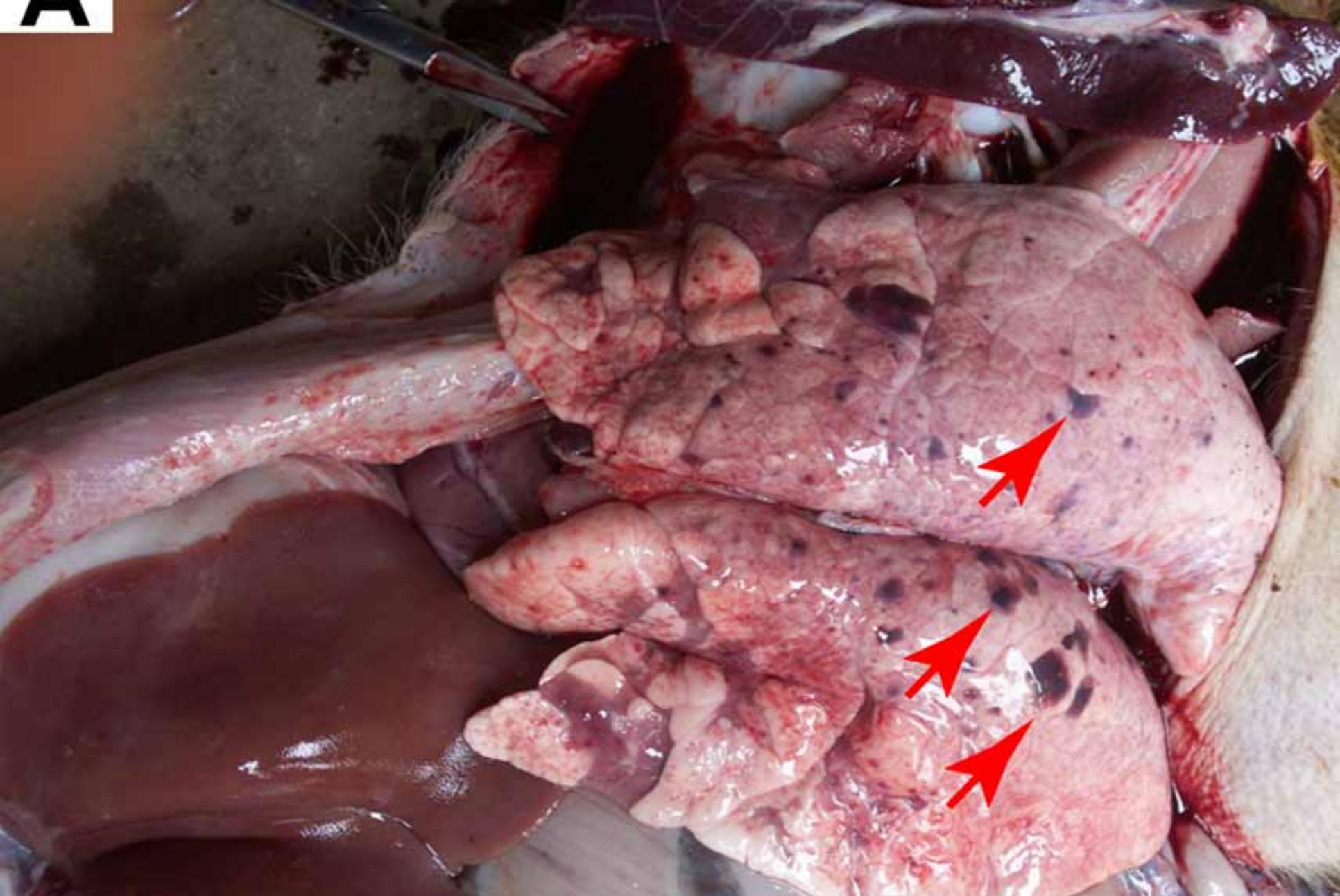
PRRS

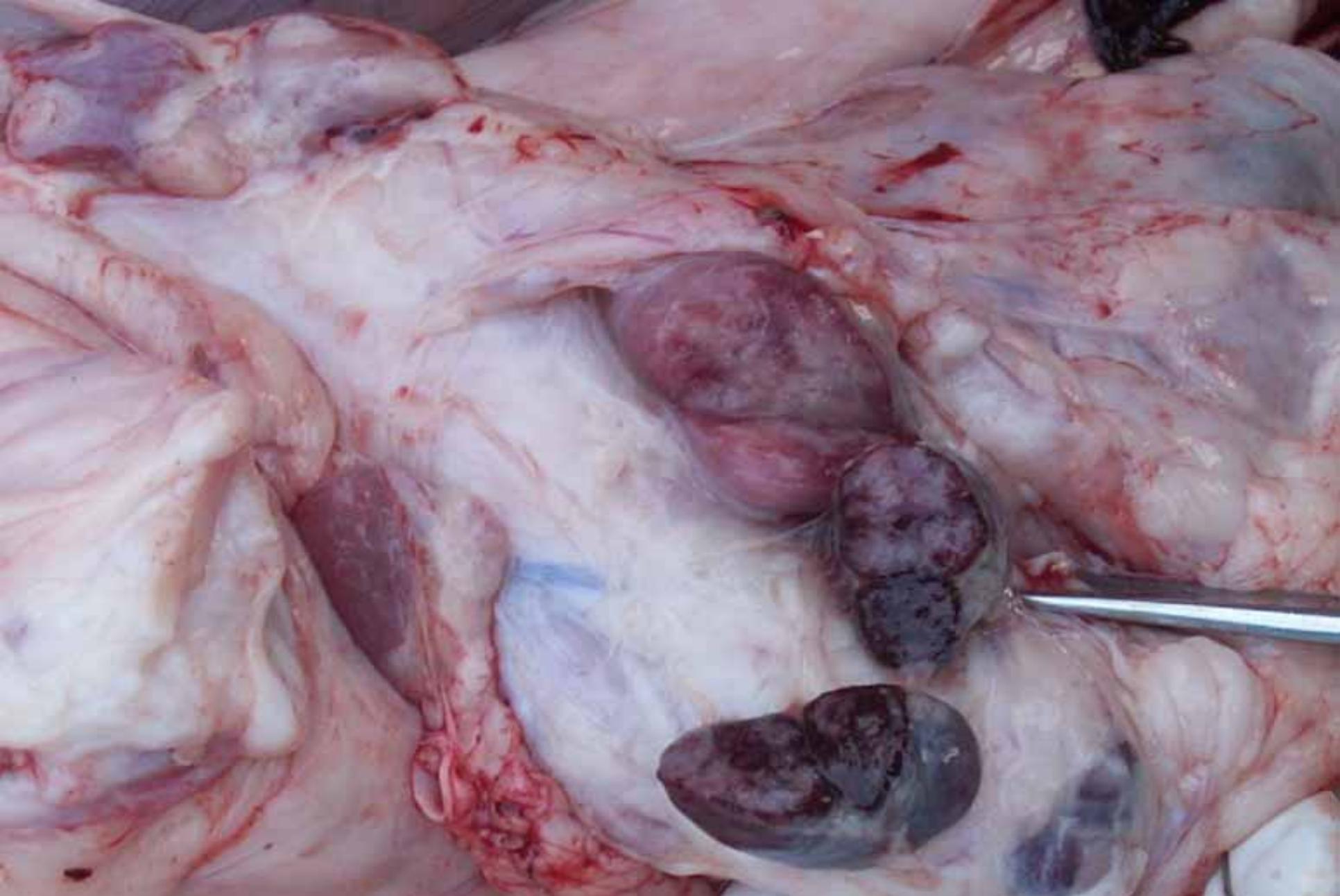
Lymph node

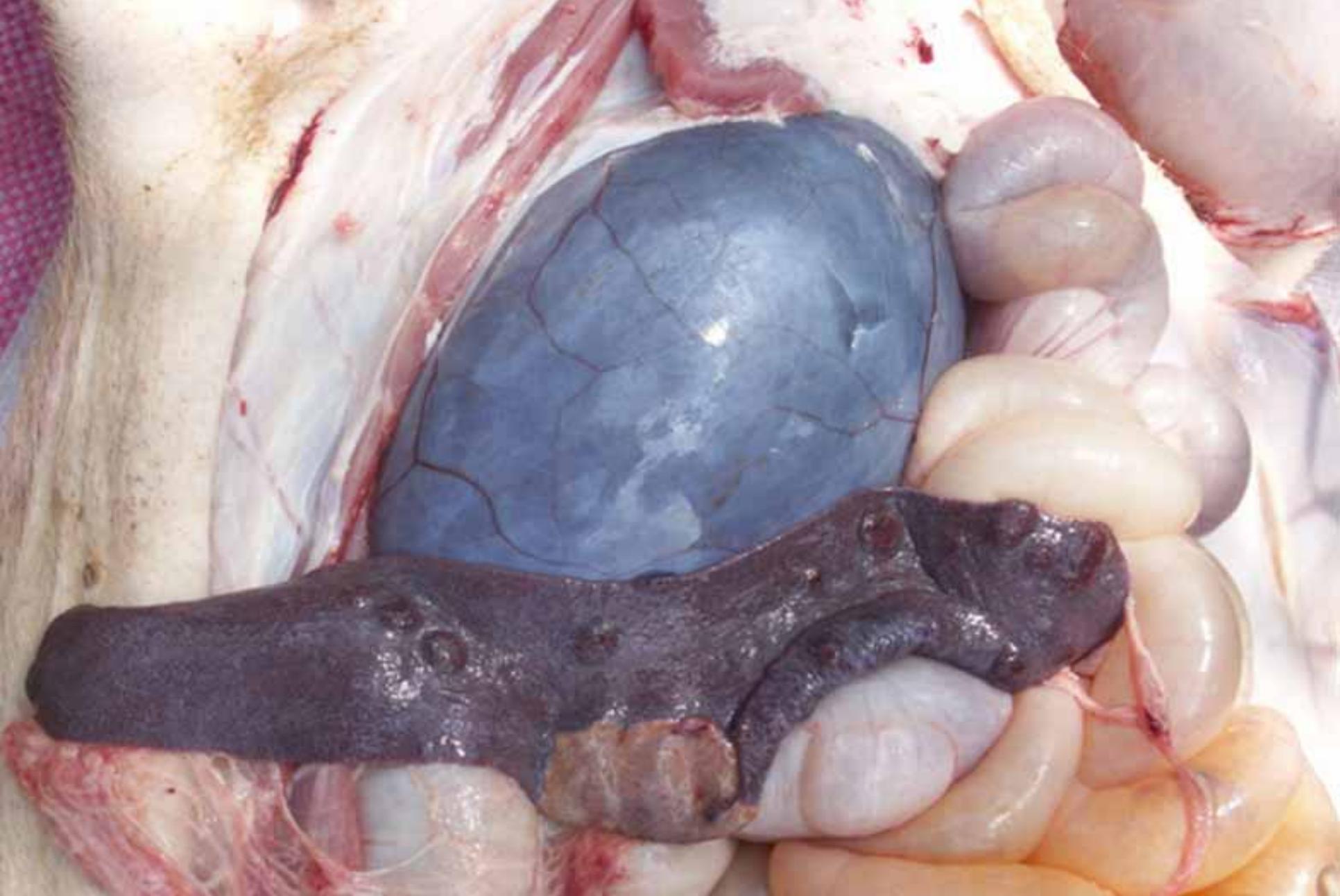
Atypical PRRS in Asia

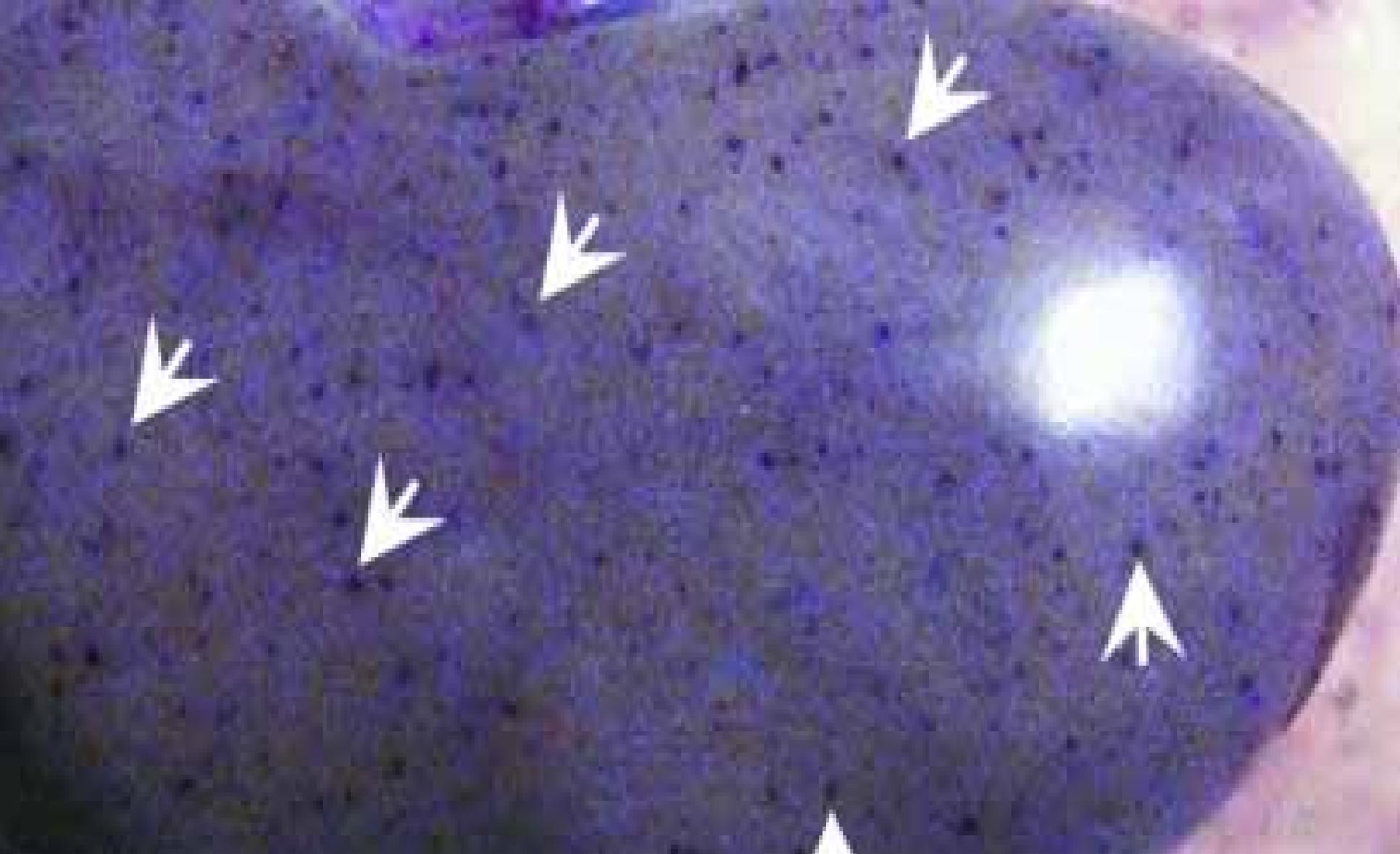
- “Outbreak” in China and Vietnam, 2004-2007
- 2006 in Jiangxi Province
- High fever and elevated mortality in grow/finish pigs, progressed to high mortality, CNS signs, swollen joints and eyelids, and late-term abortions
- Experimental reproduction by Zhou et al., 2008
- According to Chinese sources
 - Affected more than 2 million pigs
 - Genetic homogeneity of strains isolated in outbreak, single and 29 AA deletion in Nsp2, highly virulent NA strain
 - Development of an effective vaccine











Feng et al. Emerging Infectious Diseases
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