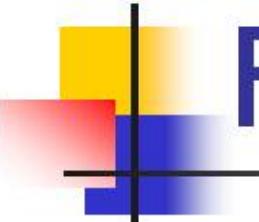


Bovine Tuberculosis in farmed Elk, Red&Sika deer in Korea

Kim, Min Jeong

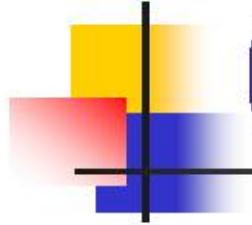
NVRQS

Pathology Division



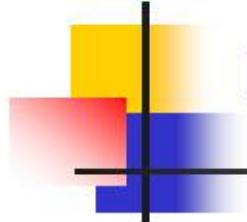
Farm History

- Jeonbuk Iksan
- The elk farm: elk(19), red deer(3), sika deer(28)
- Showing clinical signs for 4M (04.9)
- Transmission another elk before 3M
- Jeonbuk livestock promotion Institute



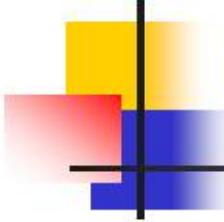
Clinical Signs

- 04.12.29 Elk, 6Y
- 05.1.18 Elk, Red deer, 7Y
- 05.2.22 Sika deer, 7Y



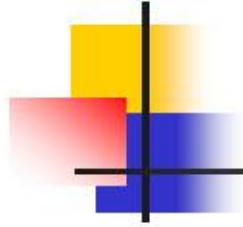
Clinical Signs

- Chronic coughing, respiratory distress, abdominal breathing, severe progressive emaciation, anorexia, depression,
- Death during the antibiotic therapy



Gross Lesion (Lung)

- Poor body condition
- Diffuse fibrinous pleuritis
- Purple red consolidation lobar pneumonia
- Numerous dark yellowish discrete or confluent 0.5 ~ 2cm nodules in the whole lung



Gross Lesion [others]

- Enlargement of bronchial, mediastinal LN
- Lymphadenopathy: abscess, pearl-like formantion
- Hepatic, renal white foci





10

20

30

40

50

60

70

80

90

100

110

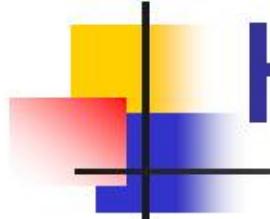
120

130

140

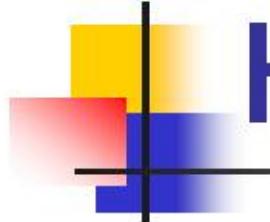
150

C型 1級



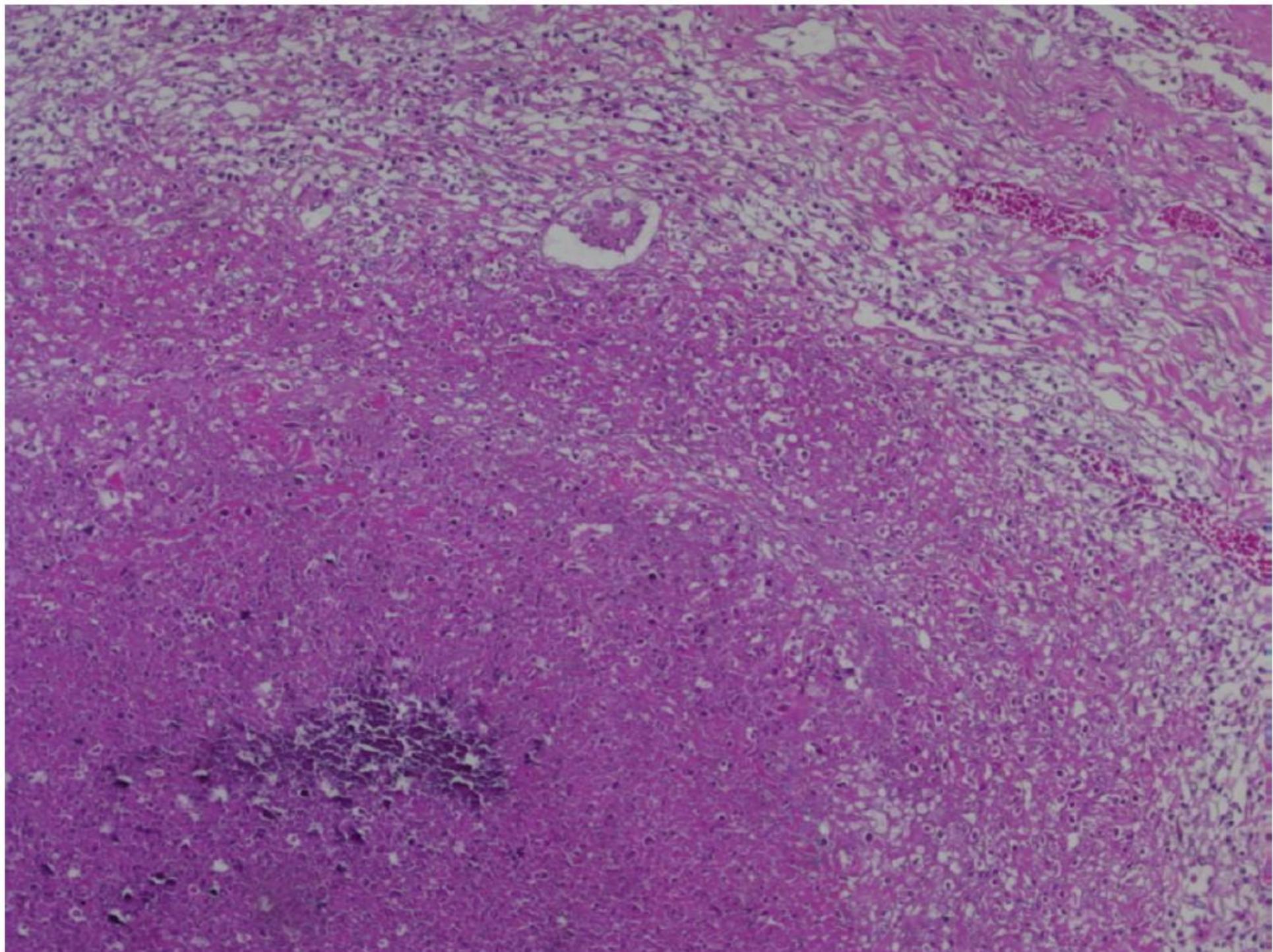
Histopathology

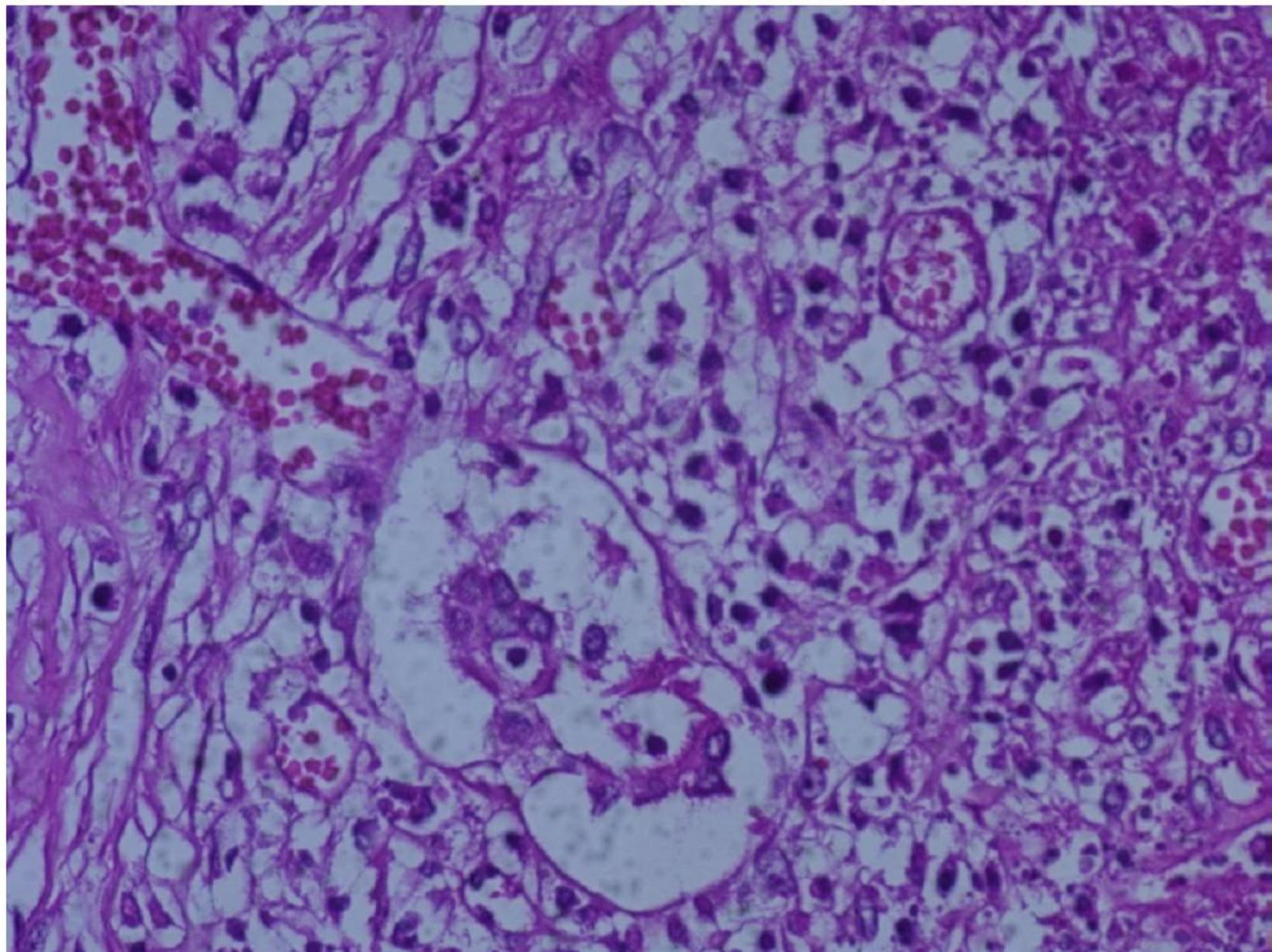
- Typical classical tuberculous granulomas
- Central caseous necrosis with central and/or peripheral mineralization
- Surrounded fibrous tissue, degenerated neutrophils, lymphocytes, macrophages, epithelioid cells, Langhans giant cells

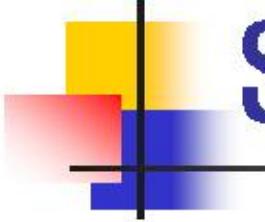


Histopathology

- Small clusters of necrosis
- Massive infiltration of inflammatory cells
- Diffuse accumulation of macrophages, epithelioid cells, Langhans giant cells
- Interstitial nephritis

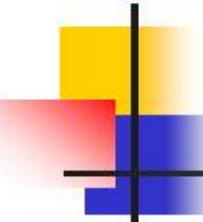




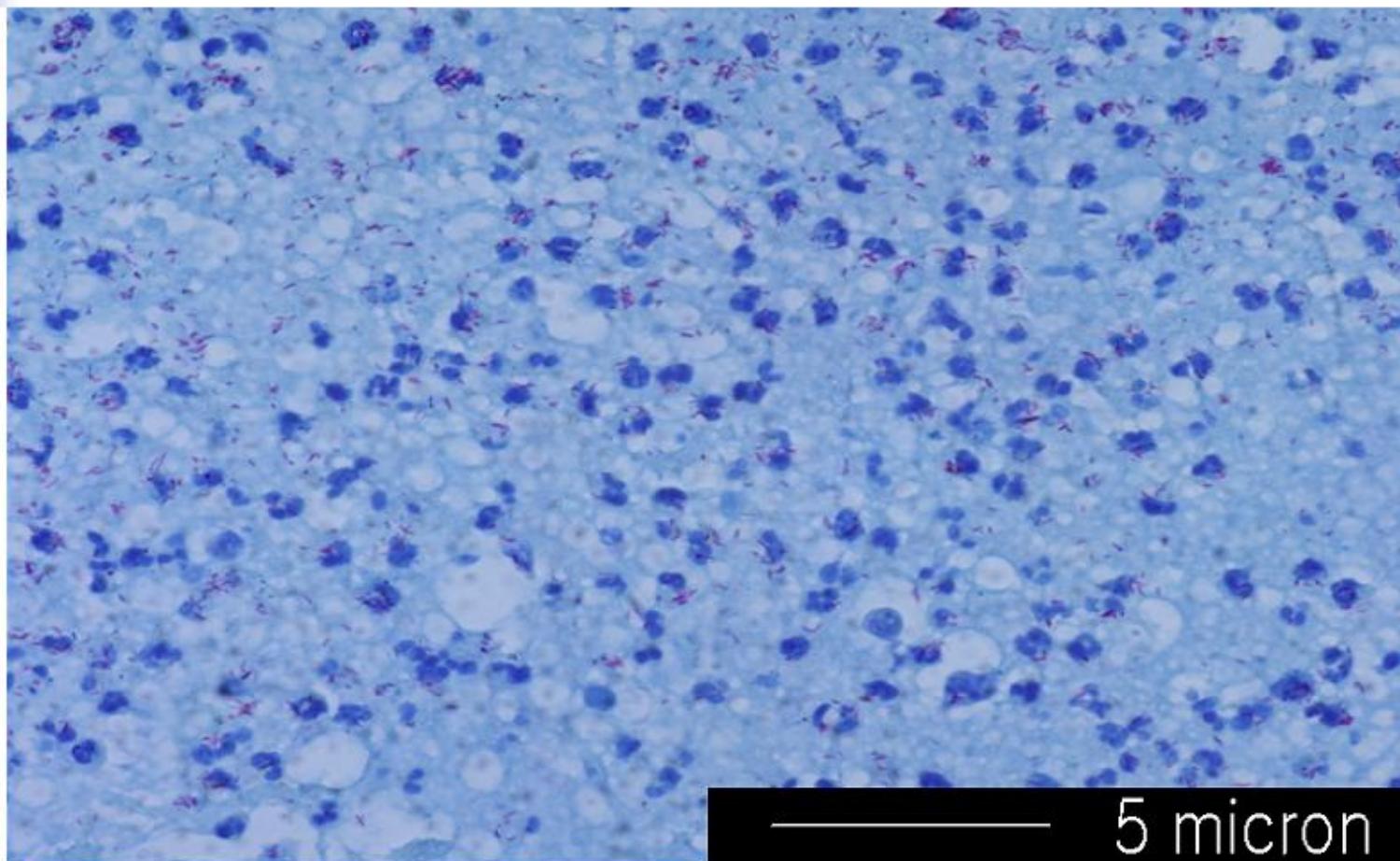


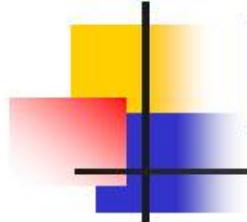
Special staining

- Ziehl–Neelsen(ZN) acid–fast stain
- Caseous foci of granulomas, abscesses and inflammatory cells
- Numerous Mycobacteria: acid–fast positive bacilli
- 3~5um long rods



Acid-fast staining

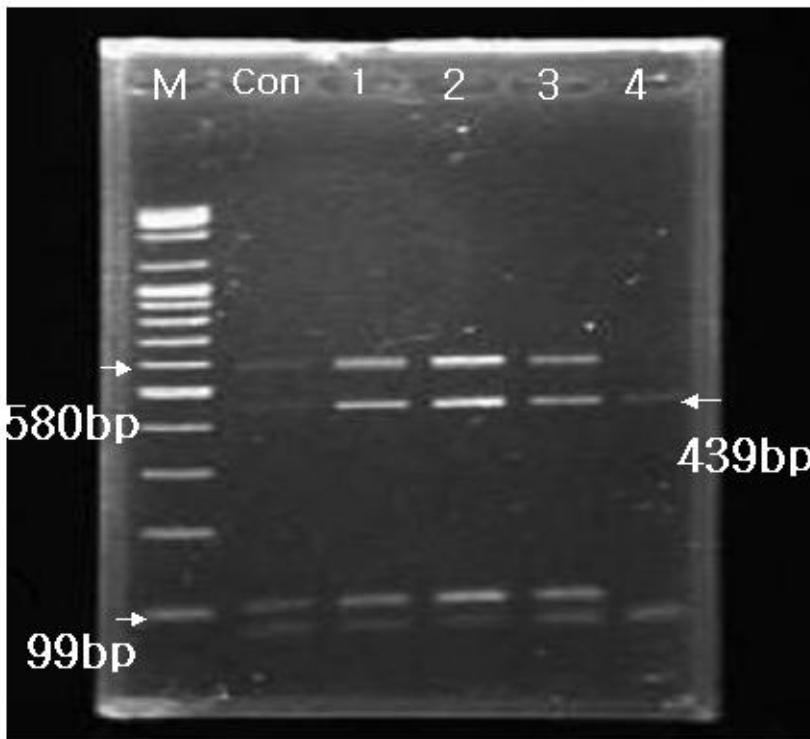




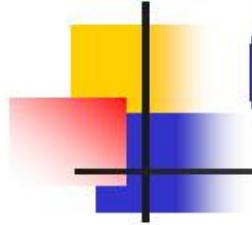
Bacteriological test (PCR)

- NVRQS, Bacteriology Div.
- TB Multiplex PCR
- Specific primer
 - space region: SR33(99bp): *M. bovis*
 - IS6110: TB284/850(580bp): *M. tuberculosis* complex
 - 65-kDa antigen gene:TB11/12(439bp):Mycobacterium

TB Multiplex PCR

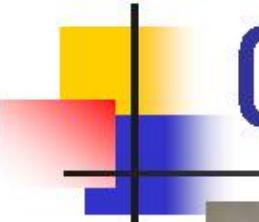


Product of multiplex PCR assay using the IS6110, 65-kDa antigen and SR 33/34. (M: 100bp size marker, Con: *M. bovis* AN5, 1~3; samples, 4: *M. avium* supsp. paratuberculosis (ATCC19698))



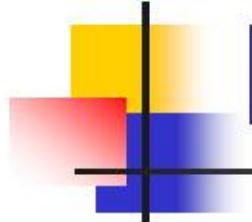
Culture isolation

- BACTEC 12B medium
- Incubation: 37°C, 8 weeks



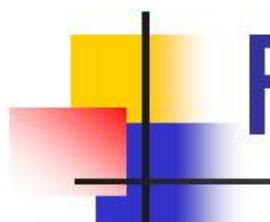
Culture isolation





Differential Diagnosis

- CWD
- Fungi
- Staphylococci
- Actinobacillus spp.
- Foreign body with abscess
- Mesothelioma



Final Diagnosis

- *Mycobacterium bovis* infection

