

# Role of bronchoalveolar lavage (BAL) in the diagnostic work-up of patients with interstitial lung disease (ild)

## Introduction





Cellular BAL fluid profile

# BAL fluid analysis helpful in the following conditions:

## Infectious

### Bacterial pneumonia

- typical
- atypical

### Mycobacterial infection

- *M. Tuberculosis*
- Atypical mycobacteria

### Viral pneumonia

- Respiratoir syncytial virus
- Cytomegalovirus
- Herpes simplex virus type
- Varicella zoster virus
- Influenza A,B
- Parainfluenza 1,2,3
- Corona viruses
- Human metapneumovirus

## Infectious

### Fungal infection

- *Pneumocystis jiroveci*
- *Aspergillus fumigatus*
- *Candida* species
- *Cryptococcus neoformans*
- *Zygomycetes*

### Parasite infection

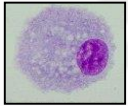
- *oxoplasma gondii*

## Non-Infectious

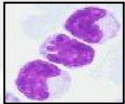
- Sarcoidosis
- Hypersensitivity pneumonitis
- Idiopathic lungfibrosis
- Connective tissue disease
- Langerhanscell histiocytosis
- Malignancies
- Alveolar hemorrhage
- Alveolar proteinosis
- Eosinofilic pneumonia
- Bronchitis obliterans with organizing pneumonia
- Asbestosis
- Silicosis

# Cells normally present in BAL fluid

Total cell count: 150.000 - 300.000 cells/ml



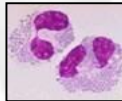
Alveolar macrophages (AMs): 80-90%



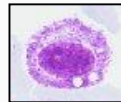
Lymphocytes (Lym): 5-15%



Neutrophils (PMNs): 1-3%

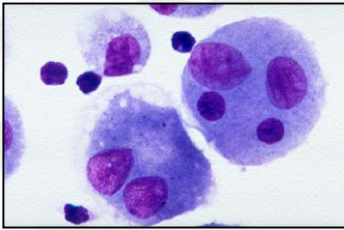


Eosinophils (Eos): < 1%

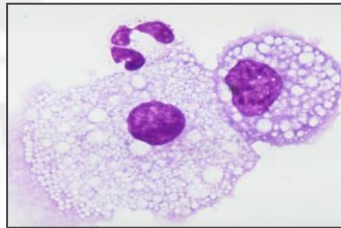


Mast cells (MC): < 1%

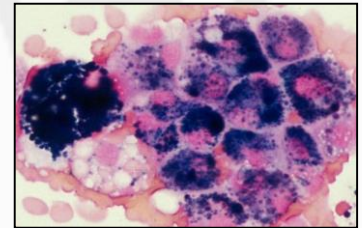
# Cytological BAL fluid features in various lung diseases



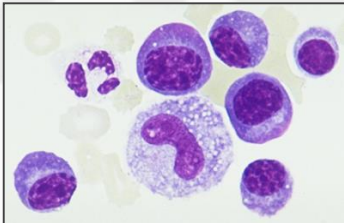
Multinucleated AMs



Foamy AMs



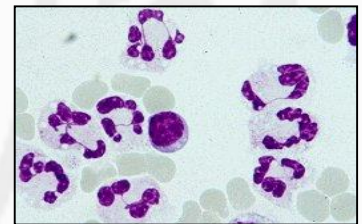
Iron loaded AMs



Plasma cells

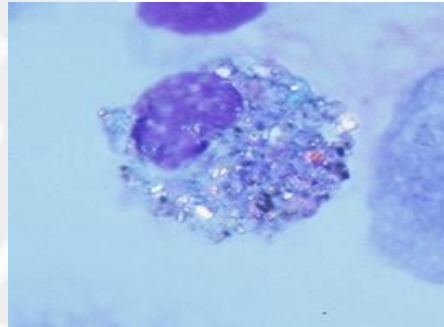


Reactive PII cells



Increased PMNs

# Birefringent material present in AM from a ceramic worker



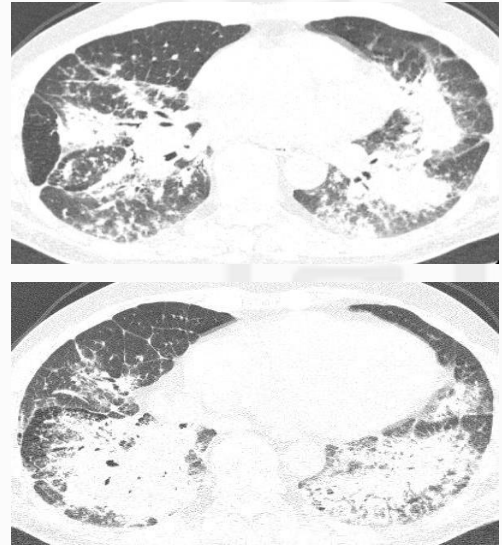
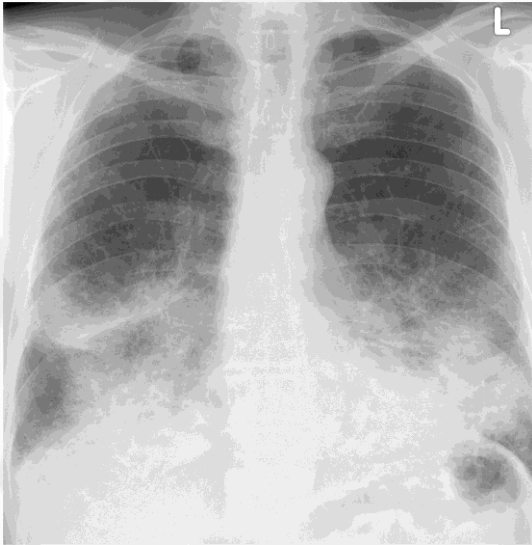
Light microscopic appearance



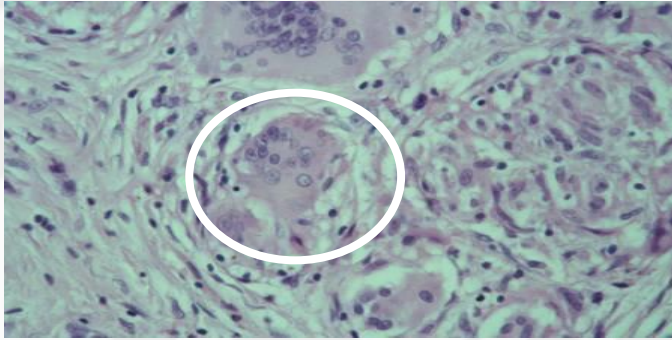
Appearance using polarized light



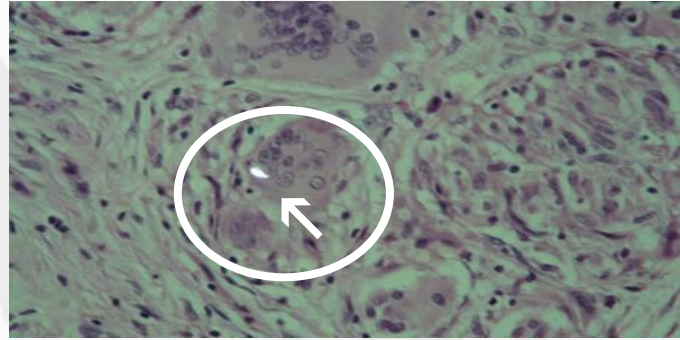
# Rockwool exposure: male born 1952



# Birefringent material within a granuloma detected by polarisation microscopy



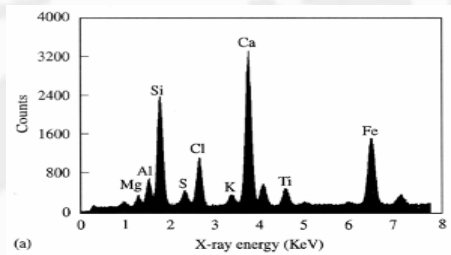
Normal light microscopic appearance



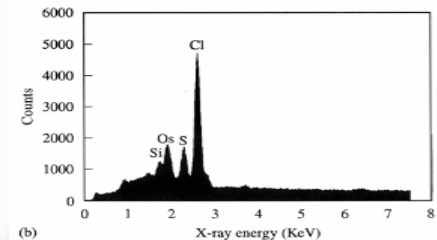
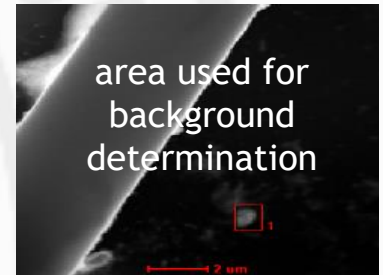
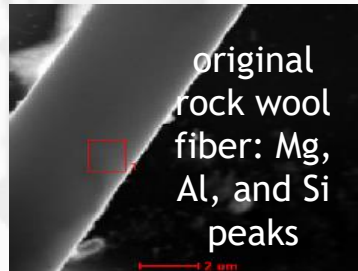
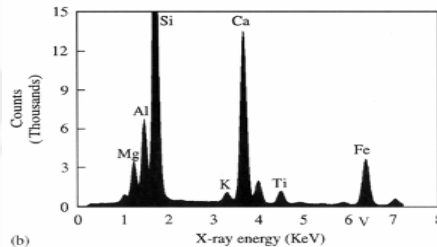
Appearance using polarized light



# Energy-dispersive X-ray spectrum



a fiber present in a granuloma of a patient exposed to rock wool



Drent et al Respir Med 2000

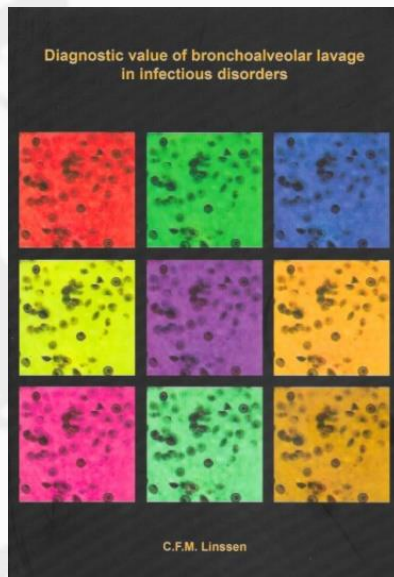
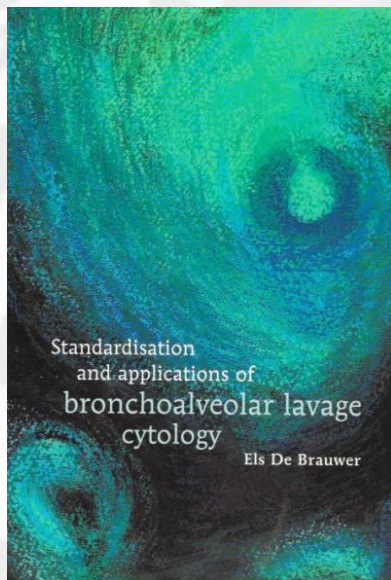


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- carpenters
- technicians
- plants
- police officers
- green house workers
- hobby
- and more...



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foundation



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