

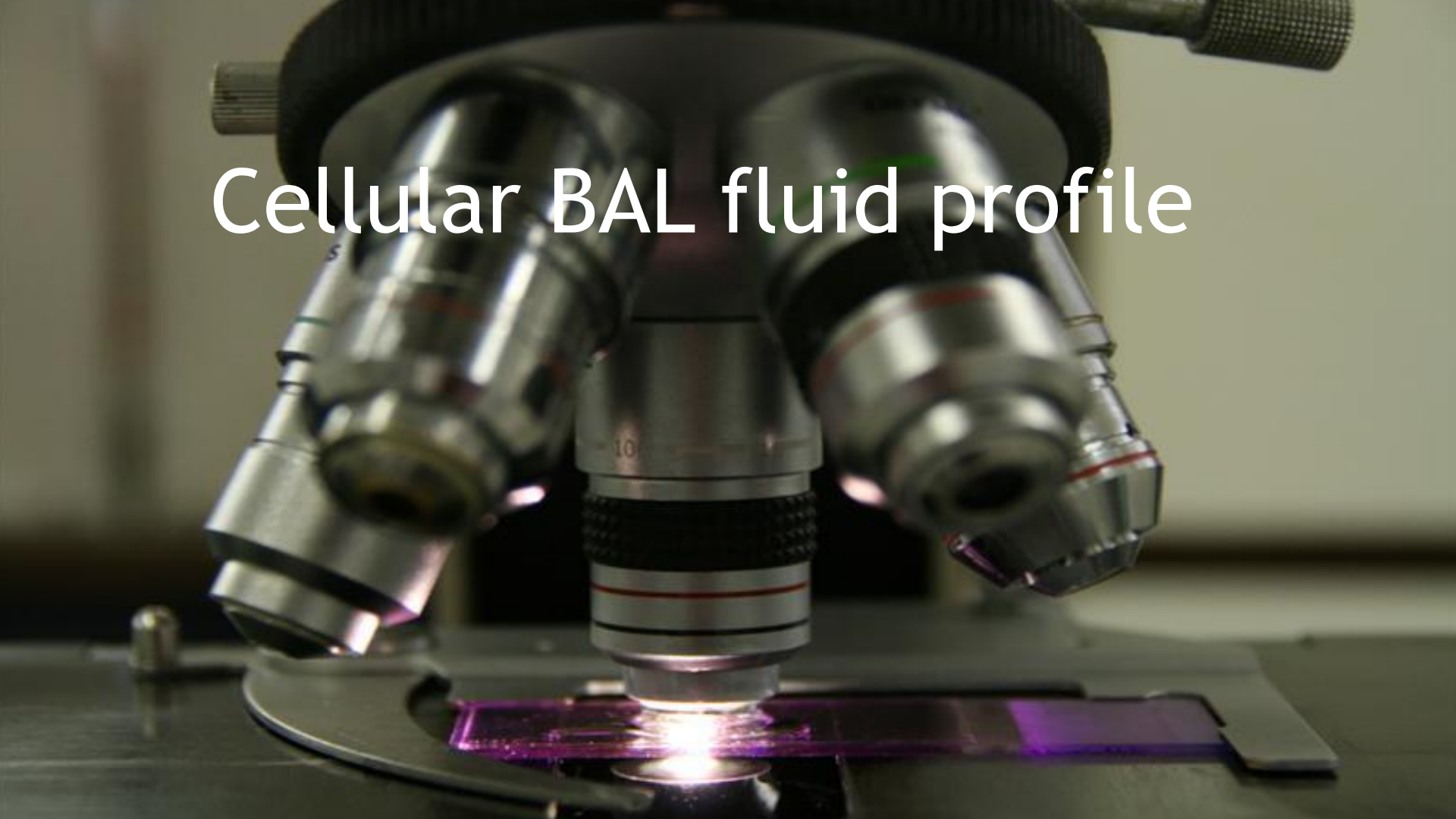
# Role of bronchoalveolar lavage (BAL) in the diagnostic work-up of patients with interstitial lung disease (ild)



## Introduction

prof. Marjolein Drent, pulmonologist, MD, PhD

Cellular BAL fluid profile



# BAL can be helpful in:

## Infectious

- Bacterial pneumonia
  - Typical
  - Atypical
- Mycobacterial infection
  - *M. tuberculosis*
  - Atypical mycobacteria
- Viral pneumonia
  - Respiratoir syncitial virus
  - Cytomegalovirus
  - Herpes simplex virus type
  - Varicella zoster virus
  - Influenza A,B
  - Parainfluenza 1,2,3
  - Corona virusses
  - Human metapneumovirus

## Infectious

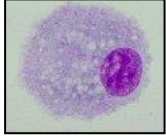
- Fungal infection
  - *Pneumocystis jiroveci*
  - *Aspergillus fumigatus*
  - *Candida* species
  - *Cryptococcus neoformans*
  - Zygomycetes
- Parasite infection
  - *Toxoplasma gondii*

## 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



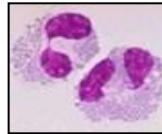
Alveolar macrophages (AMs): 80-90%



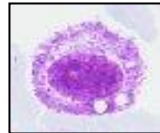
Lymphocytes (Lym): 5-15%



Neutrophils (PMNs): 1-3%

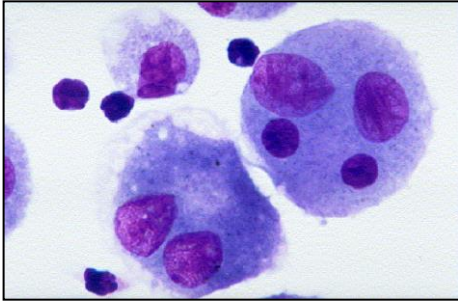


Eosinophils (Eos): < 1%

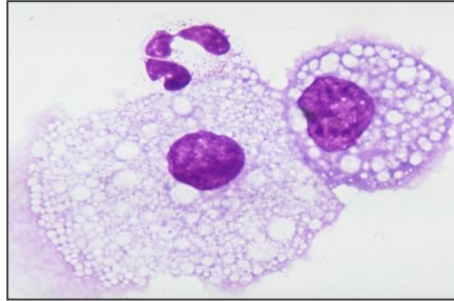


Mast cells (MC): < 1%

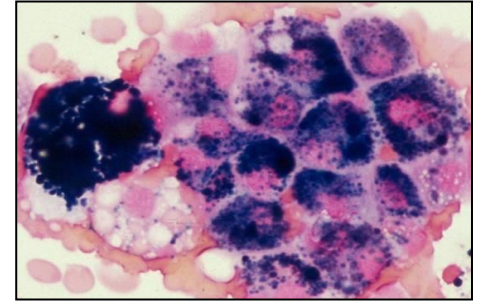
# Cytological BAL fluid features in various lung diseases



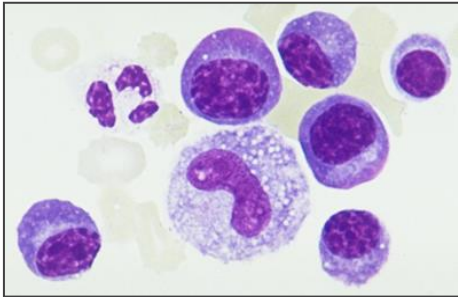
Multinucleated AMs



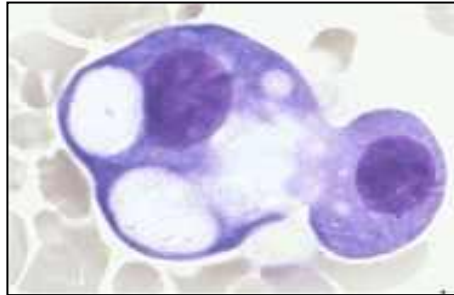
Foamy AMs



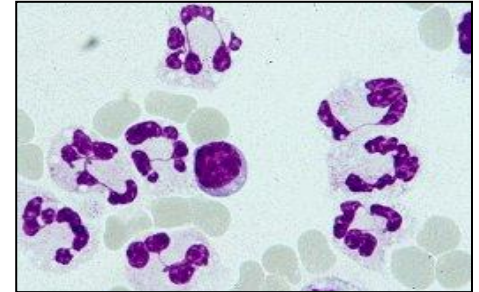
Iron loaded AMs



Plasma cells

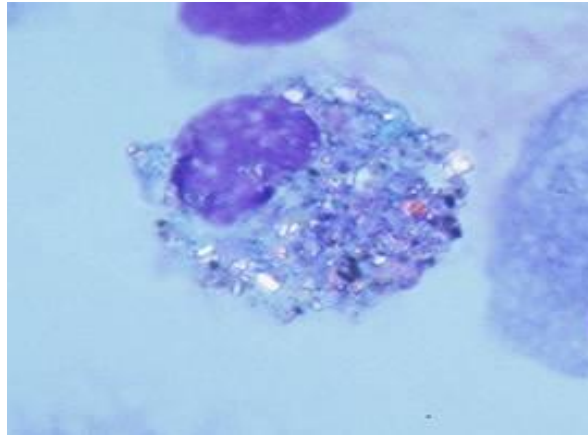


Reactive PII cells



Increased PMNs

# Birefringent material present in AM from a ceramic worker



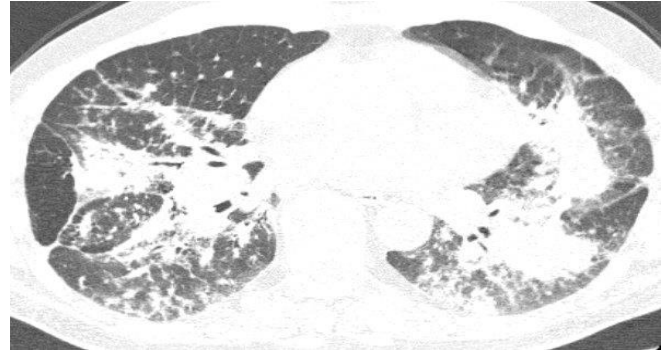
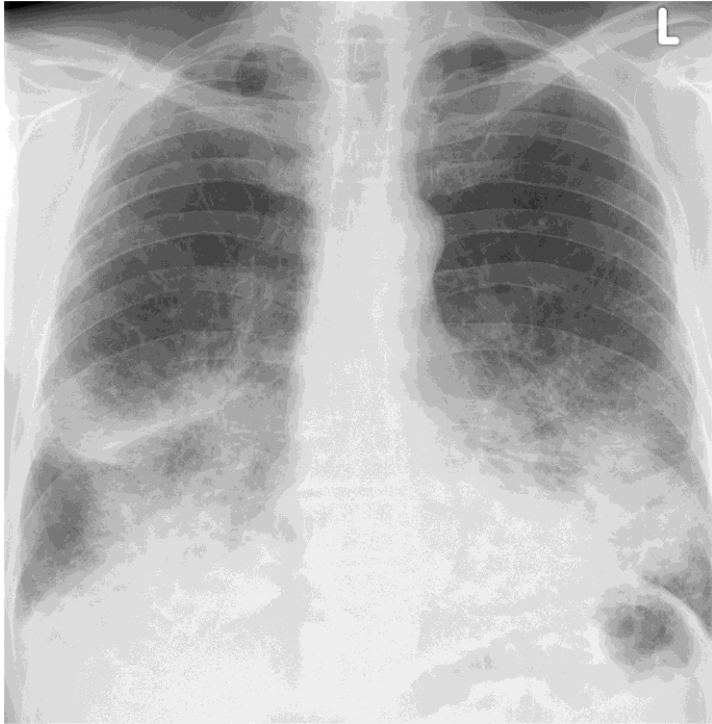
Light microscopic  
appearance



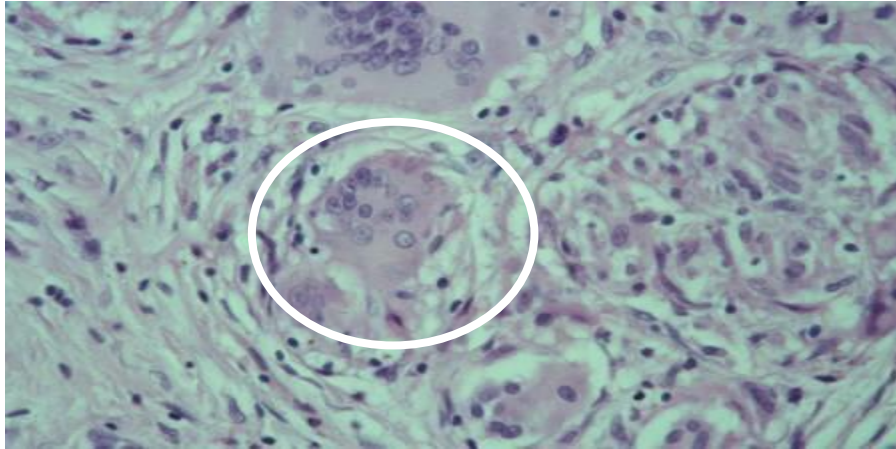
Appearance using  
polarized light



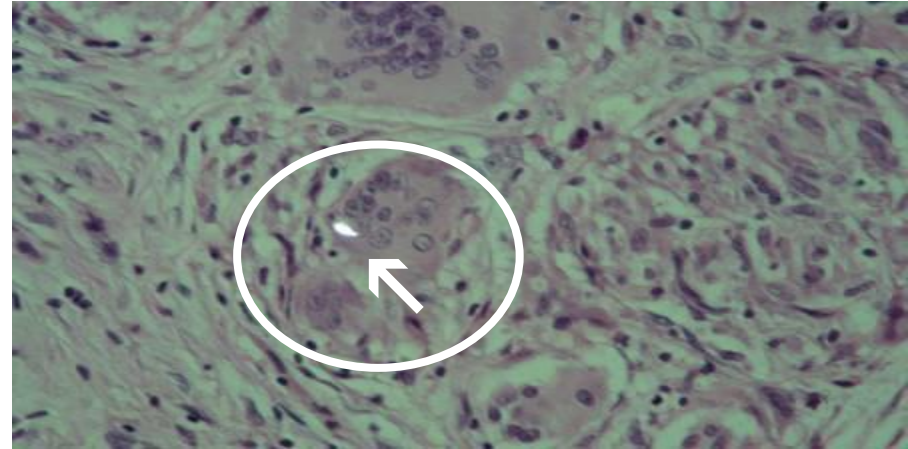
# Rockwool exposure: male born 1952



# Birefringent material within a granuloma detected by polarisation microscopy



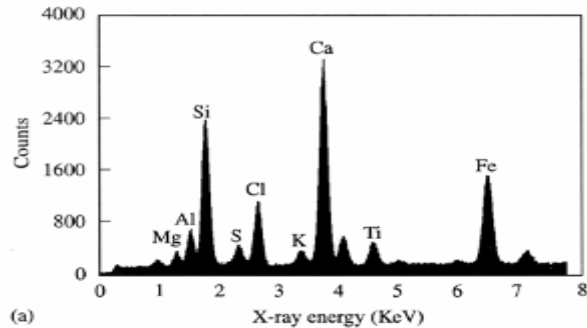
Normal light microscopic appearance



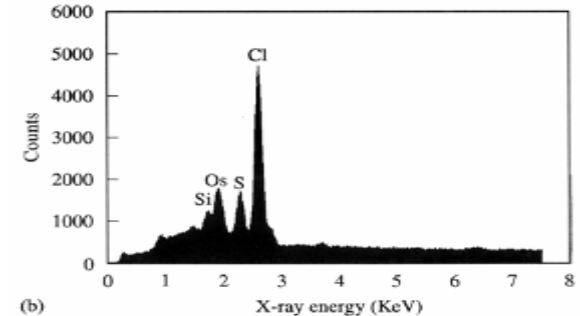
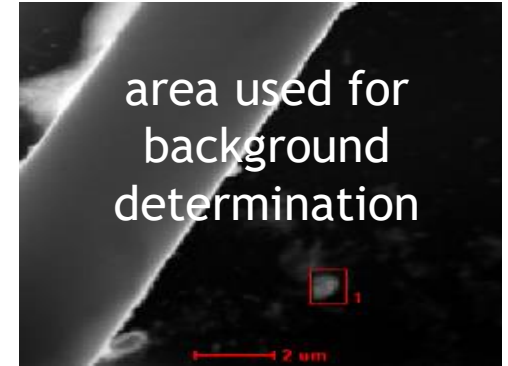
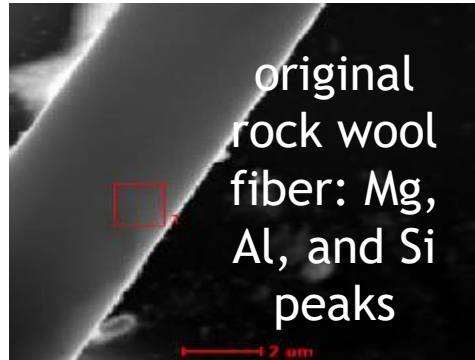
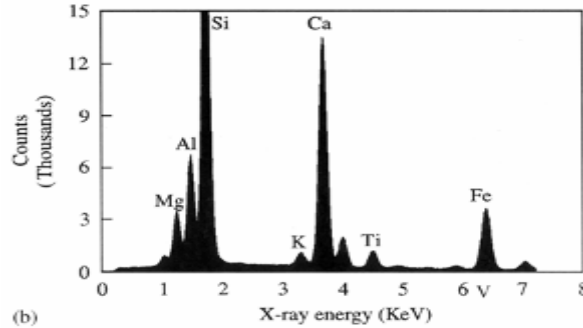
Appearance using polarized light



# Energy-dispersive X-ray spectrum



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

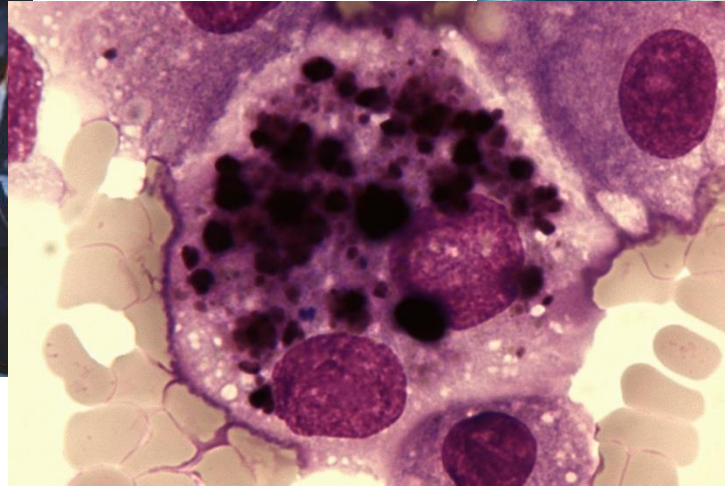
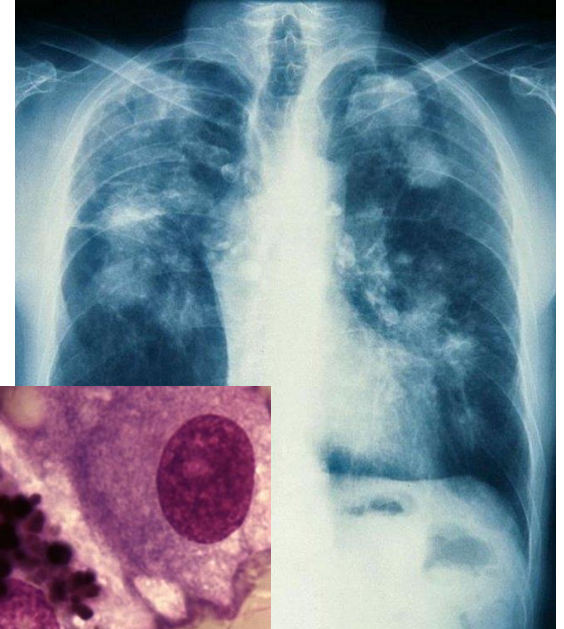
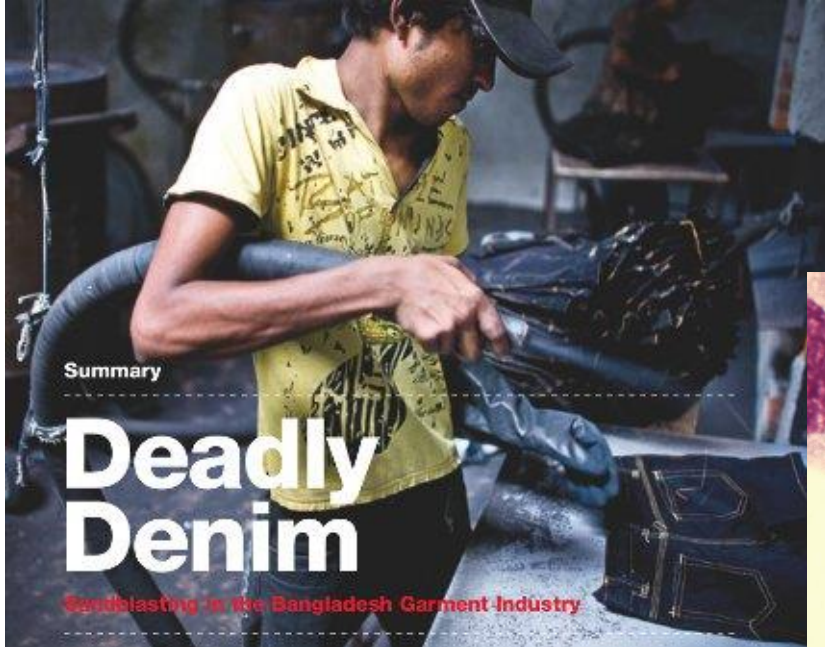




# Contact glas fibres and rockwool

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

# Foreign bodies present in AM from a jeans sandblaster



# PhD theses dealing with BAL

