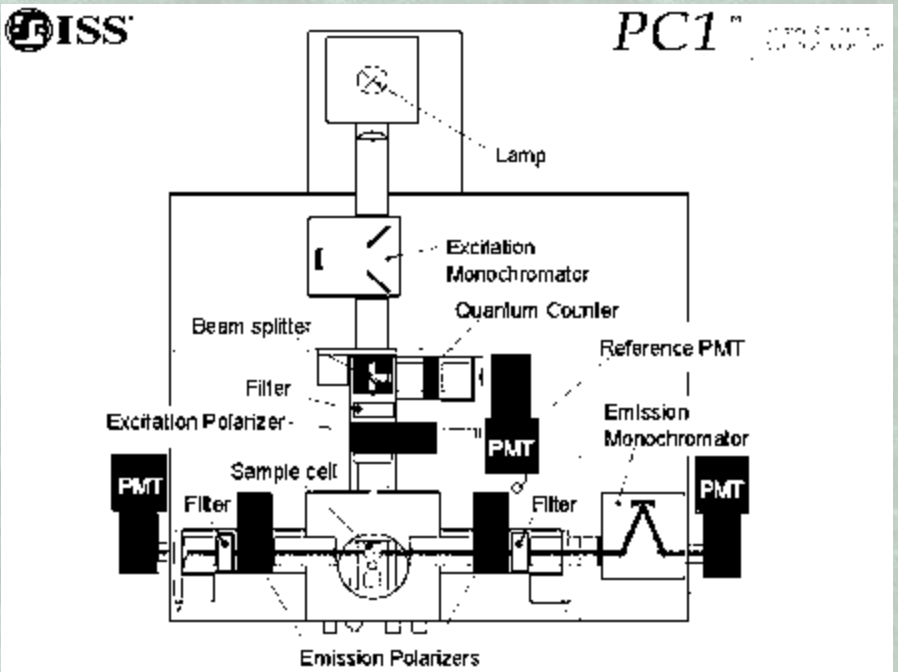
Fluorescence Spectrophotometer



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- **Fluorescence**

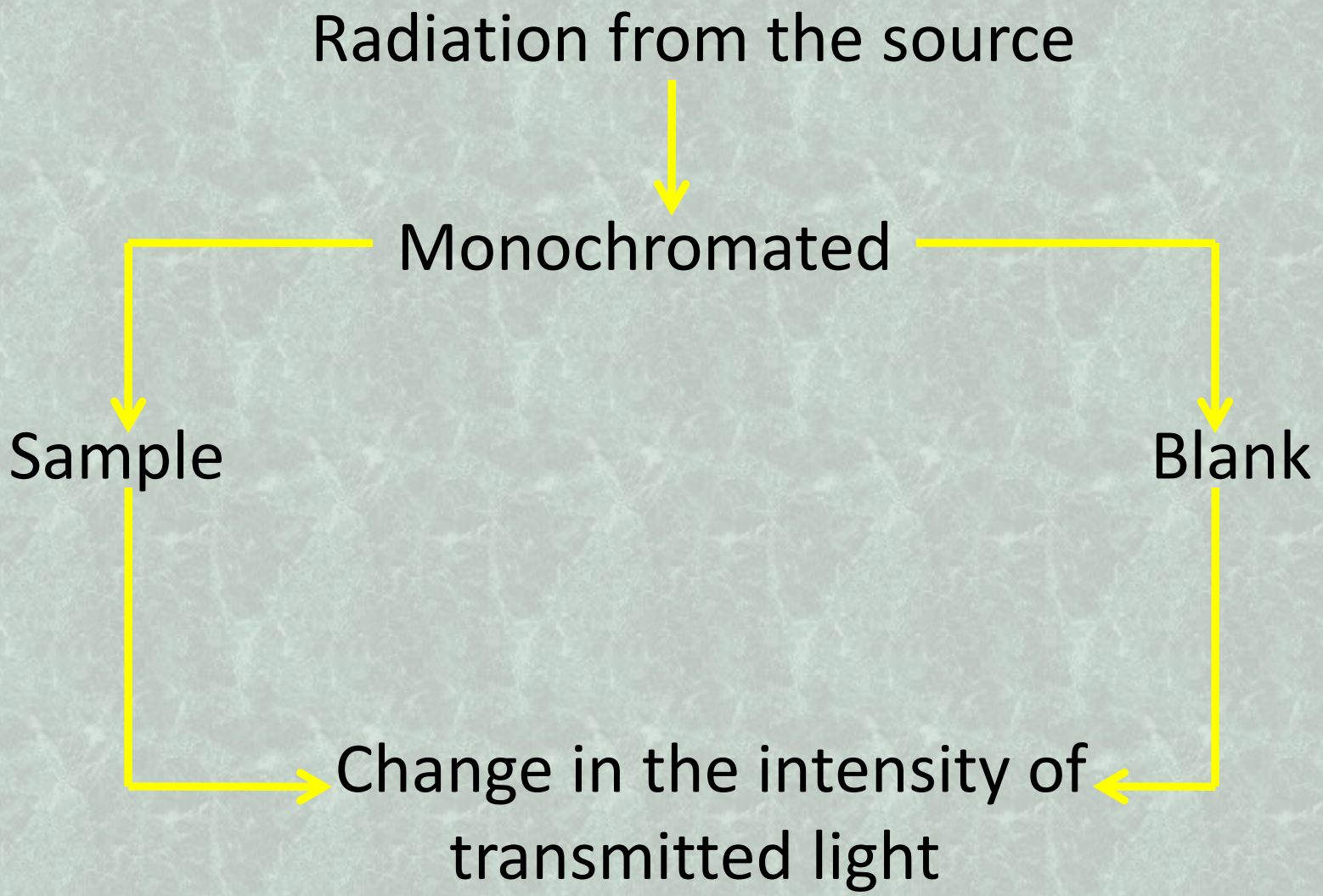
  - Light radiation from certain substances
  - Property of absorbing invisible light and emitting visible light

- **Spectrophotometer**

  - Spectrometer : produces colored light of single wavelength using monochromator

  - Photometer : measures radiant power of monochromatic light using phototube for detection

Principle


Radiation from the source
Monochromated
Sample
Blank
Change in the intensity of transmitted light

Parts

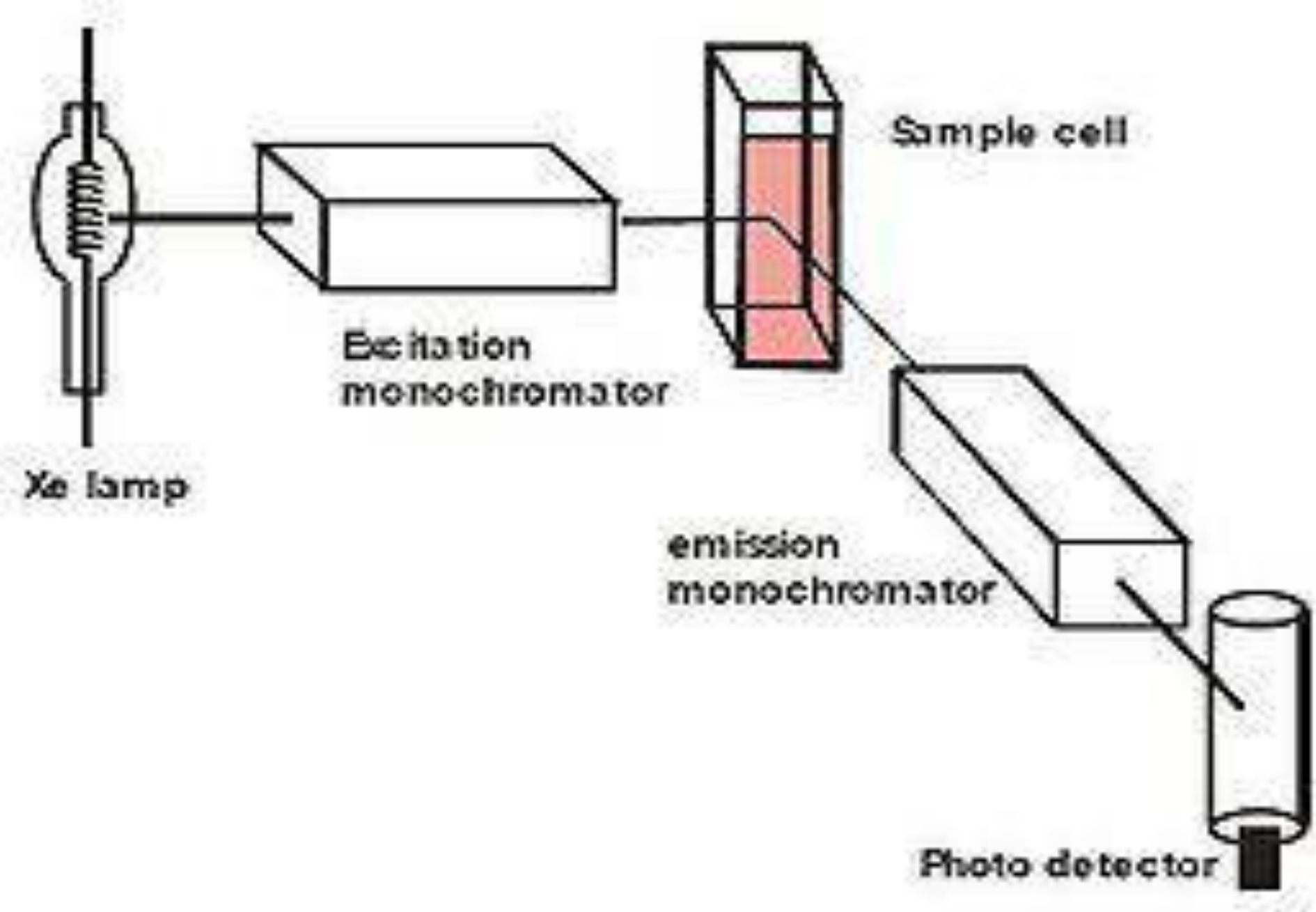
- **Light source**
- **Monochromator**
- **Sample holder**
- **Detector**

- Various light sources used for excitation :

  - Lasers
  - Photodiodes
  - Xenon arcs
  - Mercury – vapour lamps

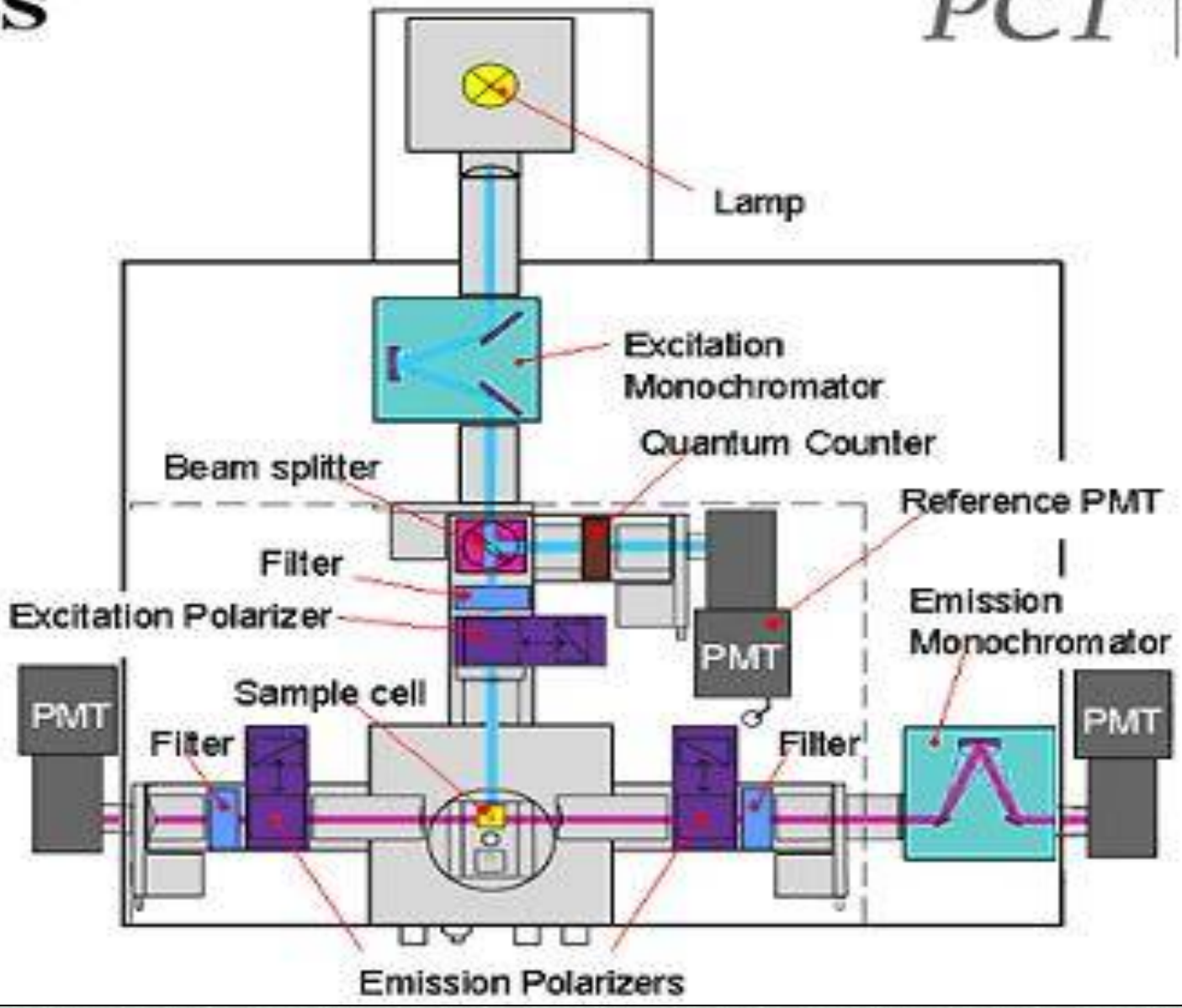
- A monochromator transmits light of an adjustable wavelength with an adjustable tolerance

- The detector can either be single-channeled or multichanneled
- The single-channeled detector can only detect the intensity of one wavelength at a time
- while the multichanneled detects the intensity at all wavelengths simultaneously


Sample cell
Excitation
monochromator
Xe lamp
emission
monochromator
Photo detector

ISS

PC1™ Photon Counting Spectrofluorometer



Working

The light from the source

↓

monochromator

↓

Sample

↓

A proportion of the incident light is absorbed by the sample

↓

some of the molecules in the sample fluorescence

The fluorescent light is emitted in all directions

↓

Some of this fluorescent light passes through a second monochromator

↓

reaches the detector

↓

which is usually placed at 90° to the incident light beam to minimize the risk of transmitted or reflected incident light reaching the detector.

Application

- Fluorescence spectrophotometer is used in biochemical, medical, and chemical research fields for analyzing organic compounds

- There has also been a report of its use in differentiating malignant, bashful skin tumours from benign.

Thank you