

Flow cytometry

A Vocabulary. Match the words on the left with suitable words on the right.

- | | |
|----------------|---------------------------|
| 1 physical | a) light |
| 2 a beam | b) light into signals |
| 3 internal | c) signals |
| 4 scatter | d) particles to detectors |
| 5 fluorescence | e) of light |
| 6 transport | f) characteristics |
| 7 convert | g) intensity |
| 8 produce | h) complexity |

B Text

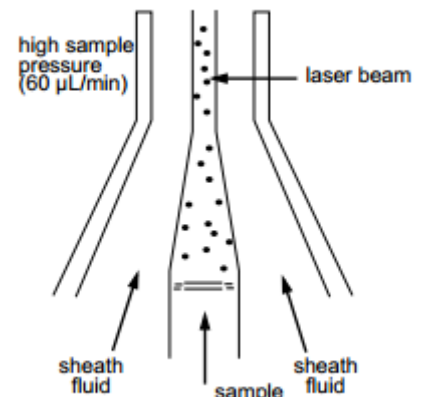
Flow cytometry is a technology that measures and then analyses multiple physical characteristics of single **particles**, usually cells, as they flow in a **fluid** stream through a **beam** of light. The properties measured include a particles' relative size, relative **granularity** or internal **complexity**, and relative **fluorescence** intensity. An optical-to-electronic coupling system records how the cell or particle **scatters** laser light and **emits** fluorescence.

A flow cytometer is made up of three main systems: fluidics, optics and electronics.

The fluidics system transports particles in a stream to the laser beam for interrogation.

The optics system consists of lasers to **illuminate** the particles in the sample stream and optical filters to direct the resulting light signals to the **appropriate** detectors.

The electronics system **converts** the detected light signals into electronic signals. These signals can then be **processed** by the computer.



In the flow cytometer, particles are carried to the laser intercept in a fluid stream. Any suspended particle or cell from 0.2-150 micrometers in size is suitable for analysis. The portion of the fluid stream where particles are located is called the sample core. Particles pass through the laser intercept and they scatter laser light. Any fluorescent molecules present on the particle fluoresce. The scattered and fluorescent light is collected by **lenses**. The scattered and fluorescent light then enters the appropriate detectors. The detectors produce electronic signals. These signals correspond with the optical signals which strike the detectors.

C Questions. Find answers to the following questions:

- 1 What properties of a cell or particle can you measure by a flow cytometer?
- 2 What light source is used in most flow cytometer?
- 3 What are the three main systems in a flow cytometer?
- 4 What is the name of the portion of the fluid stream where the cells are located?
- 5 When cells pass through the focused laser beam, what two types of light signals do you get?
- 6 Which part of the flow cytometer collects light emitted by a particle?

Vocabulary warm-up

1 Particles	příslušný
2 Fluid	vydávat, vyzařovat
3 Beam	čočky
4 Granularity	přeměnit
5 Complexity	zpracovat
6 Fluorescence	granularita
7 Emit	částice
8 Scatter	paprsek
9 Illuminate	komplexnost
10 Appropriate	kapalina
11 Convert	fluorescence
12 Process	osvítit, ozářit
13 Lenses	rozptýlit

Grammar point

Past perfect (předminulý čas)

15.1 Read the situations and write sentences from the words in brackets.

- 1 You went to Sue's house, but she wasn't there.
(she / go / out) She had gone out.
- 2 You went back to your home town after many years. It wasn't the same as before.
(it / change / a lot)
- 3 I invited Rachel to the party, but she couldn't come.
(she / arrange / to do something else)
- 4 You went to the cinema last night. You got to the cinema late.
(the film / already / start)
- 5 It was nice to see Daniel again after such a long time.
(I / not / see / him for five years)
- 6 I offered Sue something to eat, but she wasn't hungry.
(she / just / have / breakfast)

15.2 For each situation, write a sentence ending with **never ... before**. Use the verb in brackets.

- 1 The man sitting next to you on the plane was very nervous. It was his first flight.
(fly) He'd never flown before.
- 2 Somebody sang a song. I didn't know it.
(hear) I before.
- 3 Sam played tennis yesterday. He wasn't very good at it because it was his first game.
(play) He
- 4 Last year we went to Mexico. It was our first time there.
(be there) We

15.4 Put the verb into the correct form, past perfect (**I had done**) or past simple (**I did**).

- 1 'Was Paul at the party when you arrived?' 'No, he had gone (go) home.'
- 2 I felt very tired when I got home, so I (go) straight to bed.
- 3 The house was very quiet when I got home. Everybody (go) to bed.
- 4 Sorry I'm late. The car (break) down on my way here.
- 5 We were driving along the road when we (see) a car which
..... (break) down, so we (stop) to help.