

Cell sorting – Flow Cytometry

How do scientists tell cells apart? Sometimes they look quite different from one another, as with this neurone and these red blood cells, but often cells that look identical can hide differences that are important for researchers to know about.

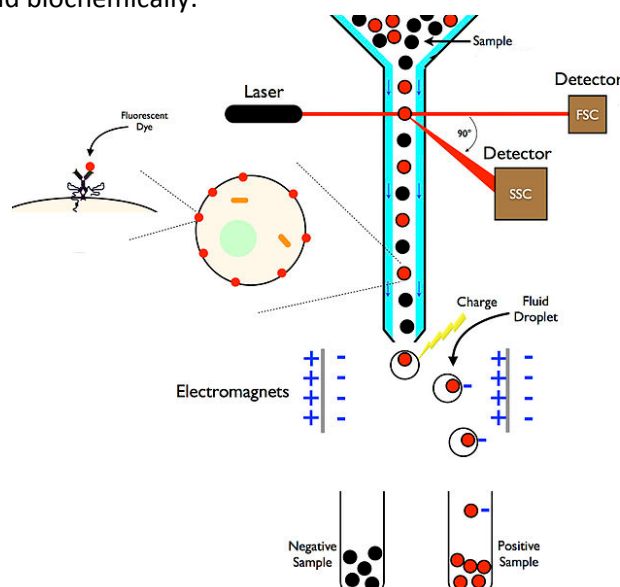


For example, cancerous cells may look the same as non-cancerous cells to you or me, but it's very important to know whether they're in a sample and how many there are for diagnosis and medical treatment. What's more, even if we can tell them apart visually it would take a very long time to sort through the millions of cells in one blood or tissue sample. To address these challenges scientists have developed equipment that can do the job much more quickly and accurately than a person could.

The equipment is called a flow cytometer and it is made up of several components which work together to measure and separate thousands of particles per second. These consist of:

- the fluidics system, which carry the cells in a fluid stream through the equipment
- the optics system, which is made up of lasers which illuminate the cells and sensors to detect the readings
- the electronics system which converts the measurements into signals that can be processed by a computer

One particular type of cell sorting is called Fluorescence-activated cell sorting, or FACS for short. Fluorescent 'tags' can be joined to an antibody which will attach to cells according to their surface properties, meaning each one will show up on the sensors for counting. The machine can also sort cells into different groups so that researchers can observe and analyse them further, both microscopically and biochemically.



Become a cell sorter!

This quick and easy game challenges you to become a cell sorter yourself.

Beginner's version: Easily-differentiated cells (general human body)

Advanced version: Similar-looking cells (white blood cells)



Individually or in a group sort the cells into different piles. Are there any strategies that you can come up with to make the job go quicker? Remember, it's not just about speed; accuracy is just as important. Why would an inaccurate sort be potentially dangerous?

Even at your quickest it's unlikely you could match a cell sorting machine: they can sort over 300 particles a second!