

GW4

# GW4 Shared Flow Cytometry Resources

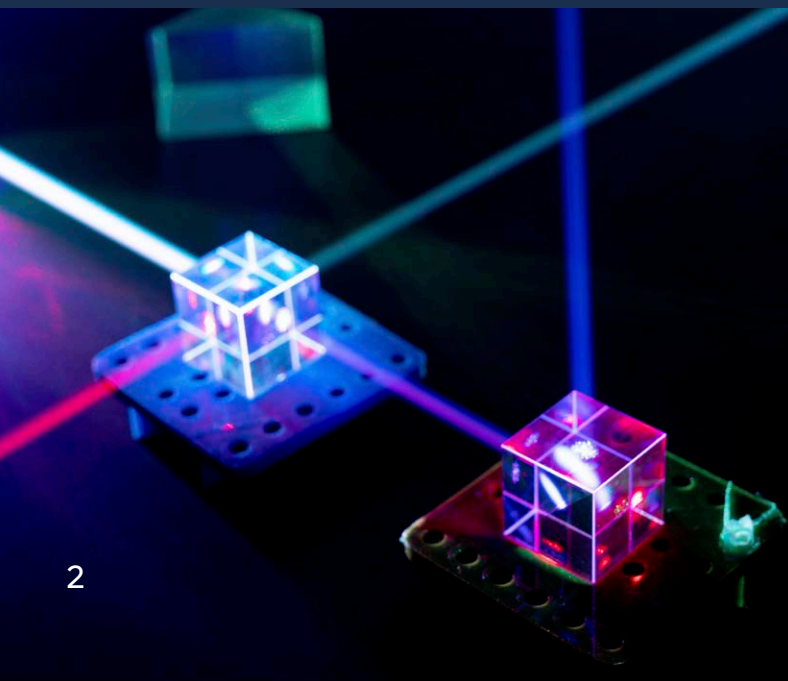


University  
of Exeter

# What are GWL Shared Resources?



World-leading  
research equipment  
and facilities  
across the region





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The GW4 Alliance brings together four of the most research-intensive and innovative universities in the UK: Bath, Bristol, Cardiff and Exeter.

GW4 Universities are progressing world class research through technological advances and interdisciplinary research. Major breakthroughs in sciences are often the

result of research technologies and the joint efforts of experts across the GW4 universities, including those from the life sciences, physical sciences, engineering and data sciences.

# GW4 Shared Resources

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## What are GW4 Shared Resources?

Shared Resources are research technology platforms located at GW4 universities (Bath, Bristol, Cardiff and Exeter) that can be accessed by researchers across GW4 and beyond, including commercial partners.

This brochure highlights GW4 Shared Resources for Flow Cytometry that are available for all to access. The focus is on cutting-edge specialised Flow Cytometry instruments. These resources are managed by fully trained technical experts providing guidance and support. The contact and access details for each facility are given. Some resources can also be booked and accessed by users with appropriate training.

## Why have GW4 Shared Resources?

Maximising the impact of these GW4 Shared Resources will enable the best support of world class research in academic and commercial environments. Sharing resources will lead to exciting new collaborations across the GW4 community and increase the visibility of the GW4 region and broader UK. Greater awareness of the broad range of resources available will lead to the more effective and sustainable use of these resources.

## How to access GW4 Shared Resources?

To access each of the resources, please see below for the relevant contact details for each research facility. The experts will advise you on the technology choice, will help you shape your research questions and tell you how to go about being trained.



# Why Flow Cytometry?

Flow Cytometry is the only quantitative cell analysis methodology that rapidly analyses multiple features of single cells or particles.

Alongside its unique analysis capabilities, it allows researchers to analyse and sort specific cells of interest based on the principle of FACS, Fluorescence-Activated Cell Sorting.

Flow Cytometry has significantly changed the landscape of high-throughput cell analysis research in biomedical research and drug development. It has also become increasingly important in a broad range of other areas including marine, plant and basic cell development research.

When it comes to analysing cells/particles in a lab setting, Flow Cytometry is a widely used and the comprehensive single-cell analysis method.



# Bio-Imaging and Cell Analysis Unit



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[www.bath.ac.uk/corporate-information/bio-imaging-and-cell-analysis](http://www.bath.ac.uk/corporate-information/bio-imaging-and-cell-analysis)

The Bio-Imaging and Cell Analysis Unit is part of the Imaging Facility at the University of Bath.

The Unit encompasses several different approaches to imaging biological and non-biological samples. Flow Cytometry is one of the main technologies offered to both internal and external users.

The bio-imaging experts provide comprehensive support on all levels, from training to experiment design to data acquisition and analysis.

Currently, the unit houses a SONY ID7000 spectral cell analyser and a Becton Dickinson FACSAria™ III cell sorter. The instruments are employed in a wide variety of different areas, including studies of inflammatory diseases, cancer research, neuroscience, developmental biology, drug discovery, novel fluorophore development, small particles and extracellular vesicles, and waste management.



BD FACSAria™ III (4 lasers, 13 colours)



SONY ID7000 (5 lasers, >40 colours)

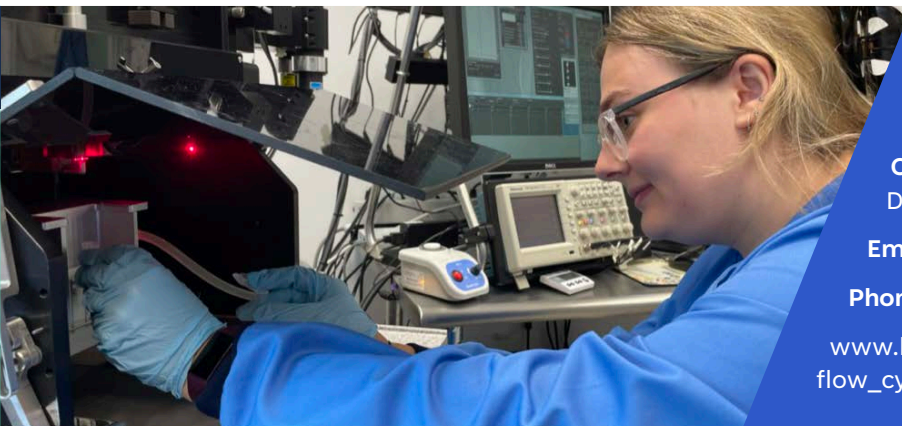
## Expertise:

Immunophenotyping, Blood/Tissue, Extracellular Vesicles, Clinical Trial Support, Mammalian Cells, Cell Cycle Analysis, Zebra Fish, Fungi, Algae, Bacteria, Phages/Viruses, Waste Management, Cell Sorting.

## Keywords:

Flow Cytometry, Fluorescence-Activated Cell Sorting (FACS), Cell Sorting, Spectral Flow Cytometry, Multiplexing, Single Cell, Cell Population Analysis, Cell Statistics, Data Analysis, Assay Development, Polychromatic Flow Cytometry, Cytomics.

# Flow Cytometry Facility



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Dr Andrew Herman

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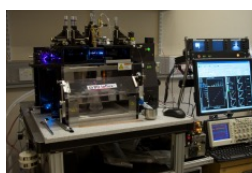
**Phone:** +44 (0) 117 331-2081

[www.bristol.ac.uk/brissynbio/equipment/flow\\_cytometry](http://www.bristol.ac.uk/brissynbio/equipment/flow_cytometry)

The Flow Cytometry Facility, housed in the Faculty of Life Sciences in the Biomedical Sciences Building, includes instrumentation for analyses and sorting of cells and particles. The facility has extensive experience with sorting of a wide range of cell types, cloning and index sorting of rare cell populations. The facility plays a critical role for research in areas including immunology, cancer biology, regenerative medicine, microbiology, cardiovascular medicine, chemistry and synthetic biology. Experimental design, data analysis and high dimensional

cell phenotyping are some of the tasks undertaken by the Facility.

The Facility includes two high speed cell sorters and four cytometers. These cytometers are routinely used for multi-colour staining analyses and fluorescent protein reporter experiments. A Luminex 200™ system is used for multiplex analysis of phosphoproteins, cytokines and other analytes. For metabolomics studies, there is an Agilent Seahorse XFe96 Analyzer.



**BD Influx™ Cell sorter**  
(4 lasers, 13 colours)



**BD FACSAria™ II SORP Cell sorter**  
(4 lasers, 16 colours)



**Cytek Aurora**  
(4 lasers, 48 colours)



**BD LSR Fortessa™ X20**  
(5 lasers, 18 colours)



**ACEA NovoCyte 3000**  
(3 lasers, 13 colours)



**BD LSR II**  
(3 lasers, 10 colours)



**Luminex 200™**



**Agilent Seahorse XFe96 Analyser**

**Expertise:**

Extracellular Vesicles, Multiplexing, Cell Sorting, Mammalian Cells, Seahorse-Metabolic Cytometry, Single Cell-Omics, Zebra Fish, Drosophila, Microbial Cytometry/Cell Sorting.

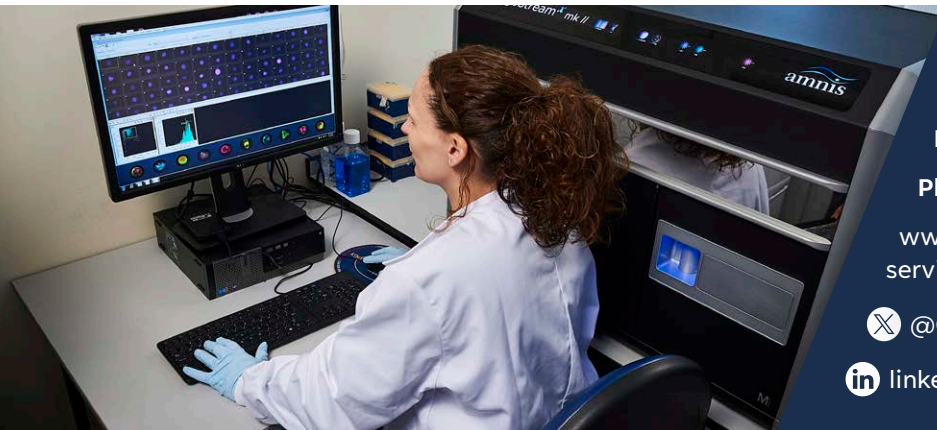
**Keywords:**

Flow Cytometry, Fluorescence-Activated Cell Sorting (FACS), Cell Sorting, Multiplexing, Single Cell, Cell Population Analysis, Cell Statistics, Data Analysis, Polychromatic Flow Cytometry, Seahorse, Metabolomic Cytometry, Luminex, Assay Development, Experimental Design.

# Central Biotechnology Services



Central Biotechnology Services  
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## Contact name:

Dr Catherine Naseriyan

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[www.cardiff.ac.uk/central-biotechnology-services](http://www.cardiff.ac.uk/central-biotechnology-services)

@CentralBioServ

[linkedin.com/company/14524236](https://www.linkedin.com/company/14524236)

Central Biotechnology Services is an ISO 9001:2015 certified and GCLP accredited technology facility offering access to a wide range of life sciences facilities. This facility is part of Cardiff University and is housed within the Heath Park campus.

Flow Cytometry is one of the focus areas of Central Biotechnology Services. The team of scientific and technological experts offers a comprehensive service including experimental design advice, sample preparation, data generation and data analysis.



**BD FACSymphony™ A3 Cell Analyser**  
(5 lasers, 28 colours)



**Amnis ImageStream X Mark II**  
(3 lasers, 12 channels)



**BD FACSAria™ III Cell Sorter**  
(3 lasers, 11 colours)



**Attune NxT Flow Cytometer**  
(3 lasers, 11 colours)



**BD LSR Fortessa™ Cell Analyser**  
(4 lasers, 16 colours)



**MESO QuickPlex SQ120**  
(MSD® platform)

## Expertise:

Immunophenotyping, Blood/Tissue, Extracellular Vesicles, Multiplexing, Clinical Trial Support, Mammalian Cells, Quality Management and Accreditation, Bioinformatics.

## Keywords:

Flow Cytometry, Fluorescence-Activated Cell Sorting (FACS), Cell Sorting, Multiplexing, Imaging Flow Cytometry, Single Cell, Cell Population Analysis, Cell Statistics, Data Analysis, Assay Development, High Dimensional Flow Cytometry, MSD, Electro Chemiluminescence, Polychromatic Flow Cytometry.

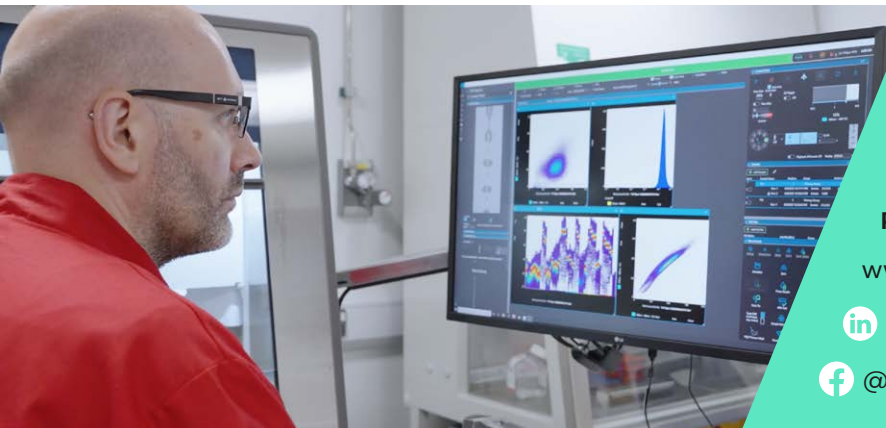


# Exeter Centre for Cytomics (EXCC)



University  
of Exeter

Centre for Cytomics



## Contact name:

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[www.exeter.ac.uk/cytomics](http://www.exeter.ac.uk/cytomics)

[linkedin.com/showcase/exetercytomics](https://www.linkedin.com/showcase/exetercytomics)

[@UoEXCC](https://www.facebook.com/UoEXCC)

[@UoEXCC](https://twitter.com/UoEXCC)

EXCC is one of the key technology resource centres at the University of Exeter, providing teaching, training, consulting, and other high-level support for different cytometry techniques such as spectral cell sorting, complex multi-colour spectral cytometry (>40 markers), single-cell genomics, multiplexing bead array assays for >50 analytes, acoustic Flow Cytometry and

quantitative imaging cytometry including spatial tissue Cytomics system.

In addition to methodological expertise, EXCC experts also support high dimensional data analysis and relevant platforms for machine learning algorithms (e.g. Bioconductor for R packages, Python or Matlab) within their well-established high-performance IT structure.



**Bigfoot Spectral Sorter**  
(6 lasers, 56 colours)



**FACSymphony S6 Spectral Sorter**  
(5 lasers, 48 colours)



**FACSARIA™ Fusion**  
(4 lasers, 16 colours)



**3 Cytek Aurora Spectral**  
(5 lasers, 64 colours)



**CytoFLEX LX I**  
(6 lasers, 21 colours)



**Attune NxT**  
(4 lasers, 14 colours)



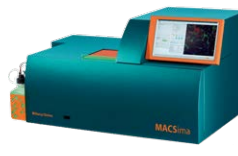
**EVOS M5000 Imaging System**



**FlowCam 8400**  
(Marine Flow Imaging)



**Amnis ImageStreamX MKII**  
(6 lasers, 12 channel)



**MACSima Tissue Cytomics**  
(Proteo-/Transcript-OMICS, +400 Marker)



**10x ChromiumX**  
(Single-Cell Genomics)



**Luminex FlexMap3D**  
(500 Analytes)

## Expertise:

Immunophenotyping, Extracellular Vesicles, Multiplexing, High-Throughput Systems, Quantitative Imaging, BSLII Cell Sorting, Single Cell-Omics, Tissue Cytometry, Bioinformatics, Fungal Research, Microbiology, Marine Biology, Plant Biology, Zoology, Environmental, Microplastics, Industrial Compliance Research, CRO for Cytometry.

## Keywords:

Flow Cytometry, Marine Cytometry, Fluorescence-Activated Cell Sorting (FACS), Multiplexing, Imaging Flow Cytometry, Single Cell, Cytomics, Spectral Flow Cytometry, Transcriptomics, Assay Development, Luminex, Polychromatic Flow Cytometry, Machine Learning, Deep Learning, R Programming, High Dimensional Data Analysis, Functional Cytometry.

# At a glance

Instrument	University	Access	Contact
Attune NxT Acoustic Flow Cytometer	Cardiff	User access	cbsadmin@cardiff.ac.uk
	Exeter	User access/Managed service	Cytometry@exeter.ac.uk
Cytek Aurora Spectral Analyser	Exeter	User access/Managed service	Cytometry@exeter.ac.uk
	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
Cytek Aurora Spectral SE Analyser	Exeter	User access/Managed service	Cytometry@exeter.ac.uk
Bigfoot Spectral Sorter	Exeter	Managed service	Cytometry@exeter.ac.uk
BD FACSAria™ II SORP Sorter	Bristol	Managed service	fls-bris-flowcytometry@bristol.ac.uk
BD FACSAria™ III Sorter	Bath	User access/Managed service	mz813@bath.ac.uk
	Cardiff	Managed service	cbsadmin@cardiff.ac.uk
SONY ID7000 Spectral Cell Analyser	Bath	User access/Managed service	mz813@bath.ac.uk
BD FACSAria™ Fusion Sorter	Exeter	Managed service	Cytometry@exeter.ac.uk
BD FACS Influx™ Cell sorter	Bristol	Managed service	fls-bris-flowcytometry@bristol.ac.uk
BD FACSymphony™ A3 Cell Analyser	Cardiff	Managed service	cbsadmin@cardiff.ac.uk
BD FACSymphony™ S6 SE Spectral Sorter	Exeter	Managed service	Cytometry@exeter.ac.uk
Amnis ImageStreamX MKII	Cardiff	User access/Managed service	cbsadmin@cardiff.ac.uk
	Exeter	User access/Managed service	Cytometry@exeter.ac.uk
BD LSR Fortessa™ Cell Analyser	Cardiff	User access	cbsadmin@cardiff.ac.uk
BD LSR Fortessa™ X20 Cell Analyser	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
BD LSR II Cell Analyser	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
ChromiumX-10xGenomics	Exeter	User access	Cytometry@exeter.ac.uk
FlowCam 8400 Imaging Cytometer	Exeter	User access	Cytometry@exeter.ac.uk
Luminex FLEXMAP 3D	Exeter	User access	Cytometry@exeter.ac.uk
Luminex 200™	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
MESO QuickPlex SQ120 (MSD® platform)	Cardiff	User access/Managed service	cbsadmin@cardiff.ac.uk
ACEA NovoCyte 3000	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
Seahorse XFe96	Bristol	User access	fls-bris-flowcytometry@bristol.ac.uk
MACSima Tissue Cytomics Imaging System	Exeter	User access/Managed service	Cytometry@exeter.ac.uk
CytoFLEX LX Flow Cytometer	Exeter	User access/Managed service	Cytometry@exeter.ac.uk

# Glossary

<b>Acoustic Flow Cytometry</b>	A technology that uses acoustic radiation pressure in addition to hydrodynamic focusing to align the cells/particles in the flow stream.
<b>Bioconductor R</b>	R is a programming language for statistical and graphical evaluation fees available. Bioconductor is an open-source software project is using the R language for various statistical evaluation modules, such as for FCS files.
<b>Cell Sorting</b>	Cell sorting is a process, in which particular events (cells/particles) are isolated based on physical and biochemical features. See also FACS.
<b>Cytomics</b>	Cytomics is the systematic research of the cellular organization (cytome) at the single-cell level. The aim is to combine all bioinformatics of single cells to determine the functionality of the cell system (Cytome). Can be considered as single-cell science using multiparametric methods to understand the complexity of the cytome.
<b>FACS</b>	Fluorescence-Activated Cell Sorting is a Flow Cytometry technology to separate cells/particles based on fluorescence phenotype.
<b>GCLP</b>	Good Clinical Laboratory Practice (GCLP) is an established international quality system for laboratories that analyse samples in accordance with Good Clinical Practice (GCP) regulations.
<b>High Dimensional Flow Cytometry</b>	High dimensional Flow Cytometry enables the analysis of a broad range of surface and intracellular antigens, by interrogating high numbers of cells and characterising rare populations for the expression of multiple parameters.
<b>Imaging Flow Cytometry</b>	This technique combines Flow Cytometry with digital microscopy to generate quantitative high throughput imaging data.
<b>Immunophenotyping</b>	This is a technique that couples specific antibodies to fluorescent compounds.
<b>ISO 9001</b>	This is the international standard for quality management. It delivers a system of continuous improvement driven by customer needs.
<b>Multiplexing</b>	The ability to simultaneously analyse multiple parameters on each cell/particle/analyte in a single sample.
<b>Polychromatic Flow Cytometry</b>	The use of multiple, specific fluorescent markers to identify and characterize cellular subpopulations in a single sample.
<b>Single Cell Genomics</b>	Advance Next Generation Sequencing technology that allows the sequencing of the genome of individual cells.
<b>SOP</b>	A standard operating procedure (SOP) is a set of written instructions that describes the step-by-step process that must be taken to properly perform a routine activity.
<b>Spectral Flow Cytometry</b>	This is an innovative Flow Cytometry technology that allows the capture of the full emission spectrum of all the fluorescent markers present in a sample, including autofluorescence signals. The technology allows the accurate detection of more than 40 parameters in a single cell.
<b>Statistics</b>	The field of mathematical science that deals with the collection, tabulation, interpretation and presentation of masses of numerical data.



# GW4

For more information about GW4  
visit our website: [gw4.ac.uk](http://gw4.ac.uk)  
follow us: [@GW4Alliance](https://twitter.com/GW4Alliance)  
contact us: [info@gw4.ac.uk](mailto:info@gw4.ac.uk)  
find us on LinkedIn: [GW4 Alliance](https://www.linkedin.com/company/gw4-alliance)



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