



Extending the scope of your research with protein production solutions

Our aim is to assist researchers from all backgrounds with the expression, purification, and analysis of their proteins of interest. We work with three different expression hosts (bacterial, insect, and mammalian cells), and use highly specialised protein purification and characterisation equipment.

General workflow



Equipment and expertise

Protein expression

- We have several different expression strategies that we can tailor to suit each protein, dependent upon what the researcher requires.
- The selection of expression host is crucial, and this table helps make an initial decision:

	Worst	Best	
Speed	Insect	Mammalian	Bacterial
Cost	Mammalian	Insect	Bacterial
PTMs	Bacterial	Insect	Mammalian
Folding	Bacterial	Insect	Mammalian

- We have specialised equipment to optimise expression and lysis conditions for your proteins.



Cell culture cabinet (left) for sterile work with mammalian and insect cells, and microscope (right)



Homogeniser (left) and sonicator (right), for cell lysis



Shaking incubators for bacterial, insect or mammalian cells culture



Centrifuges for a variety of uses including cell extract clarification

Protein purification

- We can employ a variety of initial purification techniques, including affinity or charge based methods. These include:
 - Ni-NTA, for polyhistidine tag.
 - Glutathione Sepharose, for GST tag.
 - Anti-FLAG affinity gel, for FLAG tag.
- We also normally recommend a second purification step by FPLC. We have several automated GE ÄKTA systems that we can use with different columns:
 - Size exclusion, for separation by size.
 - Ion exchange, for separation by charge.
 - Different types of affinity chromatography.



ÄKTA Pure with a size exclusion column and two different affinity columns

- We also have expertise in ultracentrifugation for membrane protein preparations, and for density gradient separation followed by automatic gradient fractionation.



Ultracentrifuge (left) and Gradient Station (right)

Protein characterisation and quality control

- Sydney Analytical has the latest equipment to facilitate the biochemical, biophysical and structural characterisation of proteins, to better understand their function, and to ensure sample quality:
 - **Uncle** and **Prometheus Panta** instruments; measure protein stability and aggregation of multiple samples simultaneously, using a combination of DSF and DLS functionalities.
 - **Refeyn Two MP Mass Photometer**; label free determination of mass measurement for single protein molecules and complexes in solution using light.
 - **Circular Dichroism**, for secondary structure characterisation and protein stability studies.
 - **SEC-MALLS**, for molecular weight and monodispersity measurements.
 - X-ray crystallography, NMR and molecular interactions facilities (see our other brochures).
 - Other techniques like SDS-PAGE, Western blot, endotoxin check and endotoxin removal, UV-vis spectrophotometry and chromatography profiling.



Prometheus Panta (left) and Refeyn Mass Photometer (right)



Circular dichroism (left) and SEC-MALLS (right)

For more information

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