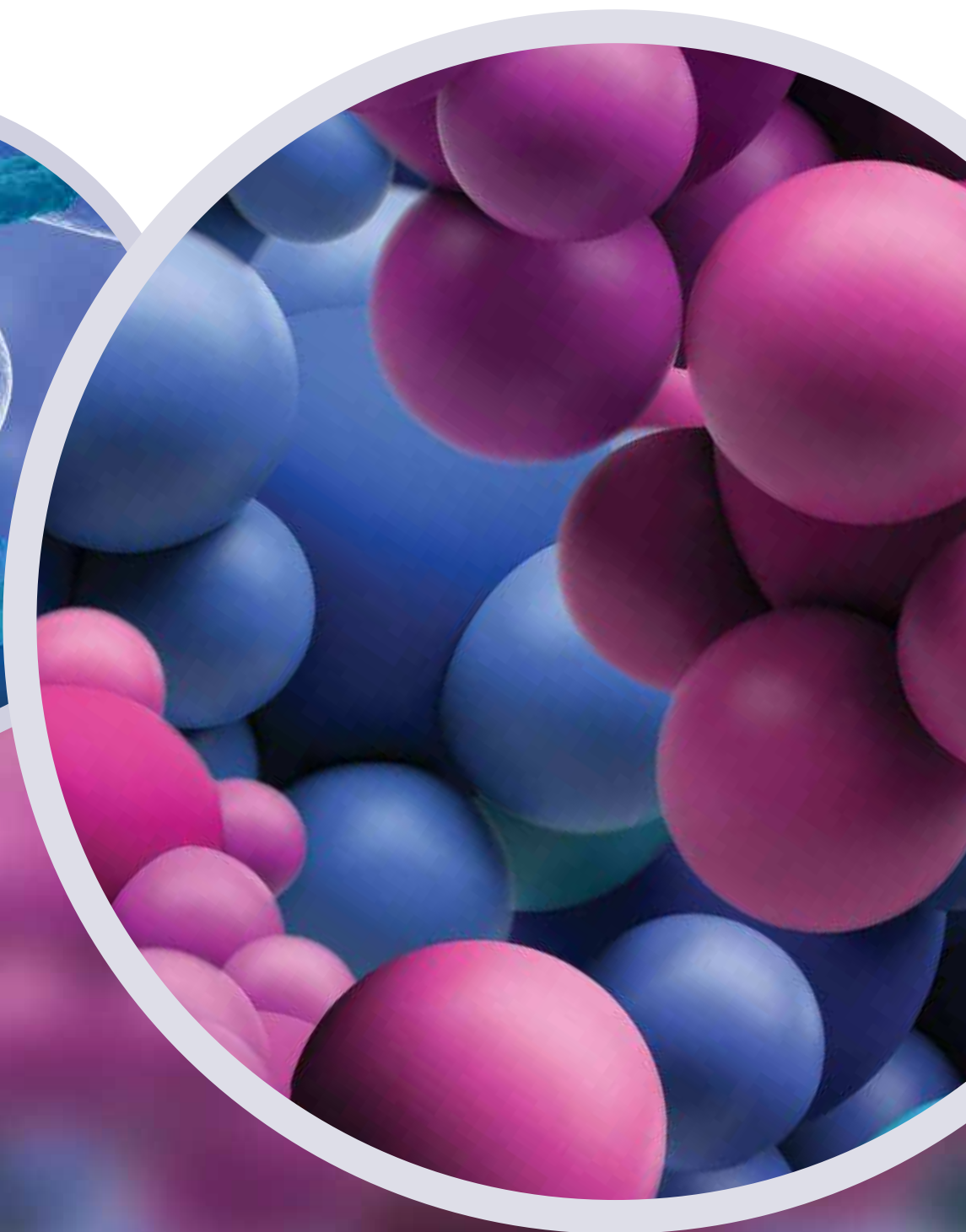


RANDOX
BIOSCIENCES

**CUSTOM ANTIBODIES
& RECOMBINANT PROTEINS**



CE



INTRODUCTION

Custom services to meet your research and development requirements

Improvements in health, medicine and diagnostics over the past century can be largely attributed to advances resulting from academic and clinical research. Randox aims to further accelerate this scientific discovery by developing unique and cutting edge products at the forefront of life sciences.

Randox Laboratories has **over 30 years experience** in clinical diagnostics and an **ISO 13485** accredited facility. We have a strong R&D ethos, employing over **250 R&D scientists** and reinvesting **20% of our turnover**, meaning our portfolio is ever expanding.

RANDOX BIOSCIENCES

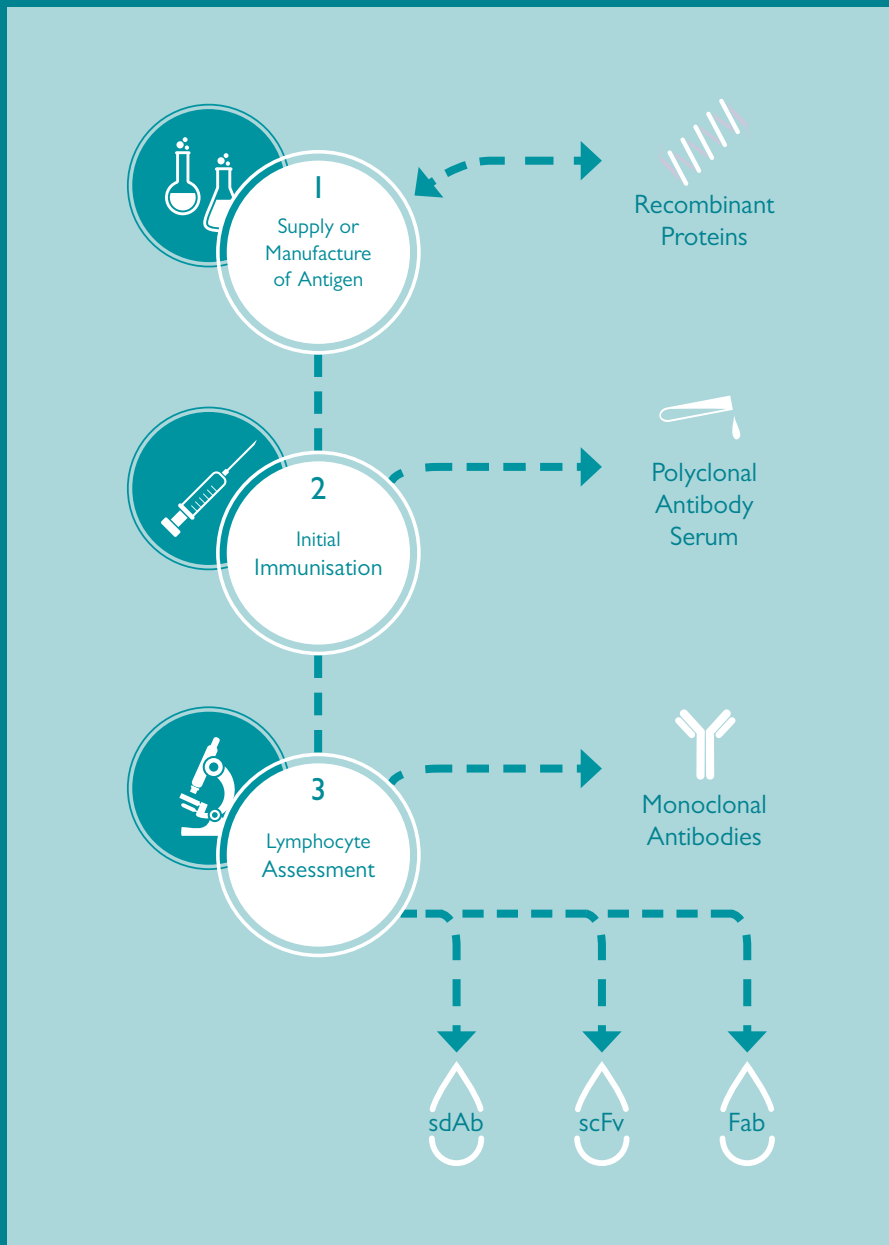
Randox Biosciences is part of Randox Laboratories and is dedicated to advancing scientific discovery, drug development and diagnostics. Randox Biosciences spans four key divisions; Life Sciences, Pharma Sciences, Research and Molecular and is a trusted partner offering complete tailored diagnostic and biomarker solutions to the clinical, life science, pharmaceutical, research and biopharma industries.

Randox Biosciences is a recognised primary manufacturer of high-quality, cost-effective human recombinant proteins, polyclonal and monoclonal antibodies and antibody fragments. Our products can be used for a range of applications including **immunotherapy, companion diagnostics, cell imaging, immunoassay development and biologic therapeutics.**

We provide the highest quality products and custom services supporting therapeutic areas such as **oncology, cardiovascular, immunology, neurosciences, metabolic and biochemical messaging.**

CUSTOM DEVELOPMENT SERVICES

An overview of the custom development process:

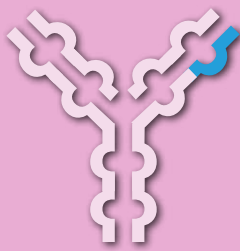


A dedicated project manager at Radox Biosciences will work with you in developing the best strategy to achieve your custom requirements whilst using the most cost effective processes available.

RECOMBINANT ANTIBODY FRAGMENTS

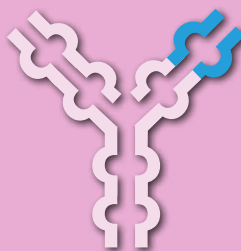
As part of our custom service, we can provide a range of Recombinant Antibody Fragments including Single Domain Antibody Fragments, Single Chain Variable Fragments and Fragment Antigen Binding Antibodies.

Single Domain Antibody Fragment (sdAb's)



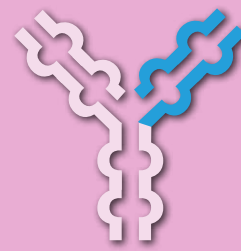
The smallest recombinant antibody format which we supply is the sdAb fragment. This comprises of a single heavy-chain variable domain at 15kDa.

Single Chain Variable Fragment (scFv's)



The second recombinant antibody format which we supply is the scFv fragment which comprises a heavy-chain variable domain linked to a light-chain variable domain at 30kDa.

Fragment antigen-binding (fAb's)



The largest recombinant antibody format which we can supply is the fAb fragment at 60kDa. It is comprised of an immunoglobulin heavy-chain variable and constant domain linked to the corresponding domains of an immunoglobulin light chain.

All of our antibody fragments have the following advantages;

Small Size	This can have many potential advantages such as better tissue penetration, higher coating concentrations and bringing binding events closer to biosensor surfaces.
No Fc Region	As the constant regions of the antibody are removed this will reduce antibody immunogenicity and the risk of assay interference.
IP Protection	The DNA of each clone is sequenced which allows better IP protection of important clones.
Guaranteed Supply	As clones are DNA sequenced and archived, future supply does not rely on the survival of a cell line.
Genetically Engineered	Our antibody fragments can be tailored allowing for adaptable and novel formats including the addition of fusion tags, site-specific conjugation and the generation of multivalent and bispecific formats.
High Affinities	Directed mutagenesis allows the generation of clones with high binding affinities.
Scalability	Due to our novel bacterial expression system, production is easily scalable allowing orders to be processed for all quantities of manufacture.

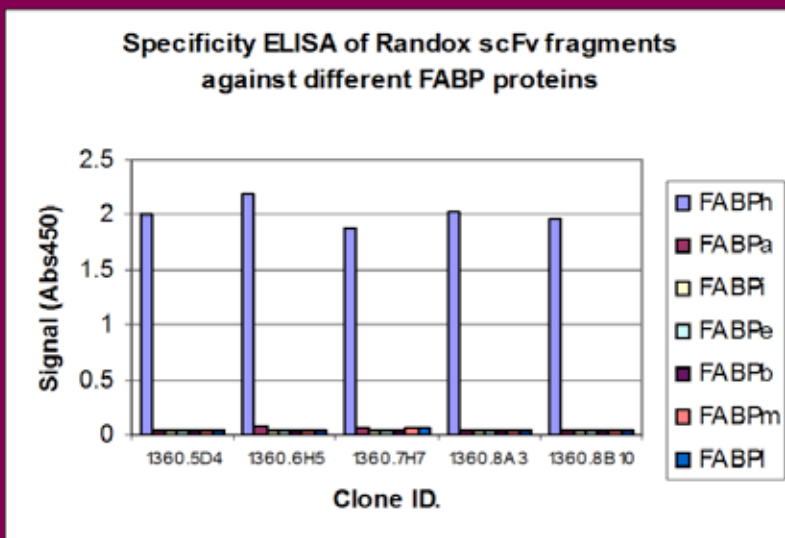
Single Chain Variable Fragments (scFv's)

We have a range of novel in-house manufactured scFv fragments which bind to a selection of classical disease biomarkers. A custom service for the isolation and production of novel recombinant antibody fragments is also available upon request.

Currently Available;

- 150 ScFv clones against multiple clinical targets
- ScFv's against biomarkers for cardiovascular disease, thyroid function, oncology, infectious agents and other disease conditions
- Multiple clones per target – ideal for external assay development
- Consultation available on epitope targeting and potential pairing of antibodies

Antibody Fragments provide excellent sensitivity and specificity;



A grayscale electron micrograph showing several antibody molecules. The molecules are Y-shaped, with two long arms and two shorter arms. They are arranged in a cluster, with some overlapping. The background is dark, and the antibodies are light gray. The top right corner of the image is cut off by the teal header.

SINGLE DOMAIN ANTIBODIES

Single Domain Antibody Fragments (sdAb's)

Radox Biosciences now offer a new customised single domain antibody generation service to the pharmaceutical and biotechnology industry.

Potential uses of single domain antibodies (sdAbs)

Toxic Payloads

sdAb conjugated or fused directly to enzyme, toxin or radionuclide for targeting of diseased cells.

Molecular Imaging

ImmunoPET scanning using conjugated radionuclide tracer.

Enzyme Inhibition

Long sdAb CDR3 loop can block enzyme active sites.

Receptor Antagonist

Blocking of signalling pathways.

Multivalent Formats

High avidity binding e.g. repeat surface antigens of viral capsids.

Bispecific Fragments

- Modulation of the immune response via recruitment of immune cell antigens to Tumour Associated Antigens (TAA) and receptors.
- Recruitment of other toxins or enzymes to cellular target.
- Isolation of dual-specificity fragments with increased functional affinities.

Anti-Toxins/Venoms

E.g. botulinum endotoxin, salmonella, snake/scorpion/spider venom.

Intrabodies

Expression within the cell to bind and interfere with a natural cellular pathway.

Companion Diagnostics

sdAb's can be used to create a companion diagnostic assay, essential for the safe and effective use of a corresponding drug or biological product.

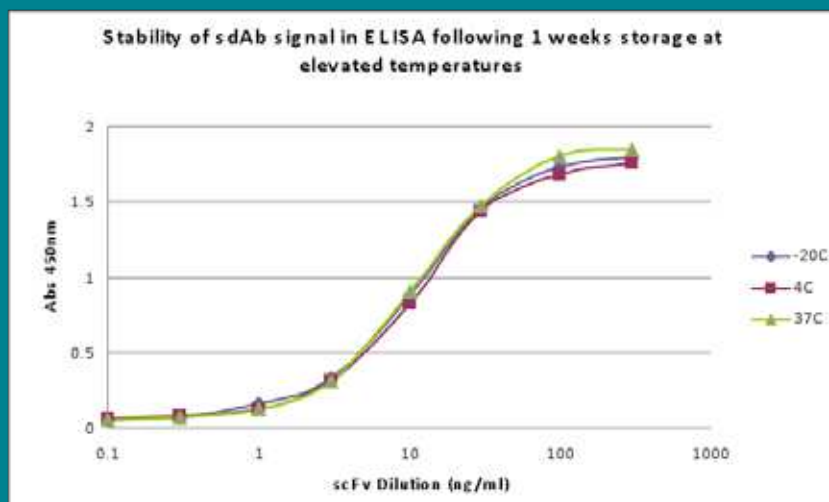
SdAb services we can offer:

- Multiple unique VHH single domains can be generated at Randox for each target antigen through our extensive animal immunisation programme
- Humanisation and optimisation for manufacture
- Recombinant immunogens and peptides can be generated in-house
- Projects can be planned to suit our partner's specific needs and requirements

Benefits

- Small size allows good tissue penetration (e.g. solid tumours) and quick renal clearance giving a clear signal to background image for molecular imaging and quick excretion of radioactive immunoconjugates
- Long CDR3 loops are particularly adept at accessing concave epitopes making them ideal for use in therapies to block receptors or the active sites of enzymes
- Compact compartmentalised VHH domains are ideal for use as building blocks to create larger multifunctional or bispecific scaffolds
- Camelid VHH domains share remarkable sequence homology with human VH3 antibody domains meaning very little work is required to humanise
- Ideal for pharmaceutical manufacture due to ease of expression and stability/uniformity of product

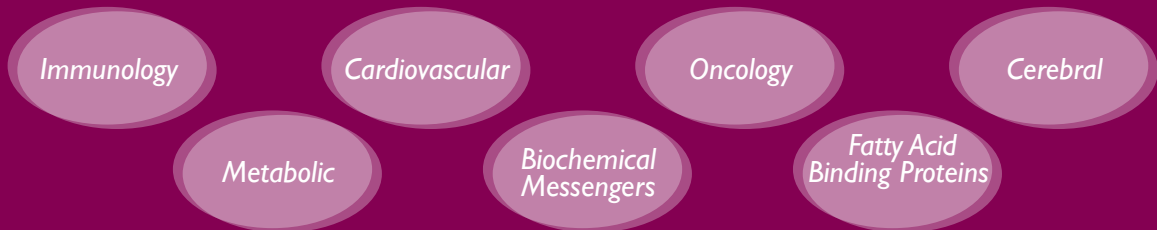
sdAb's have unrivalled stability compared to other antibody formats



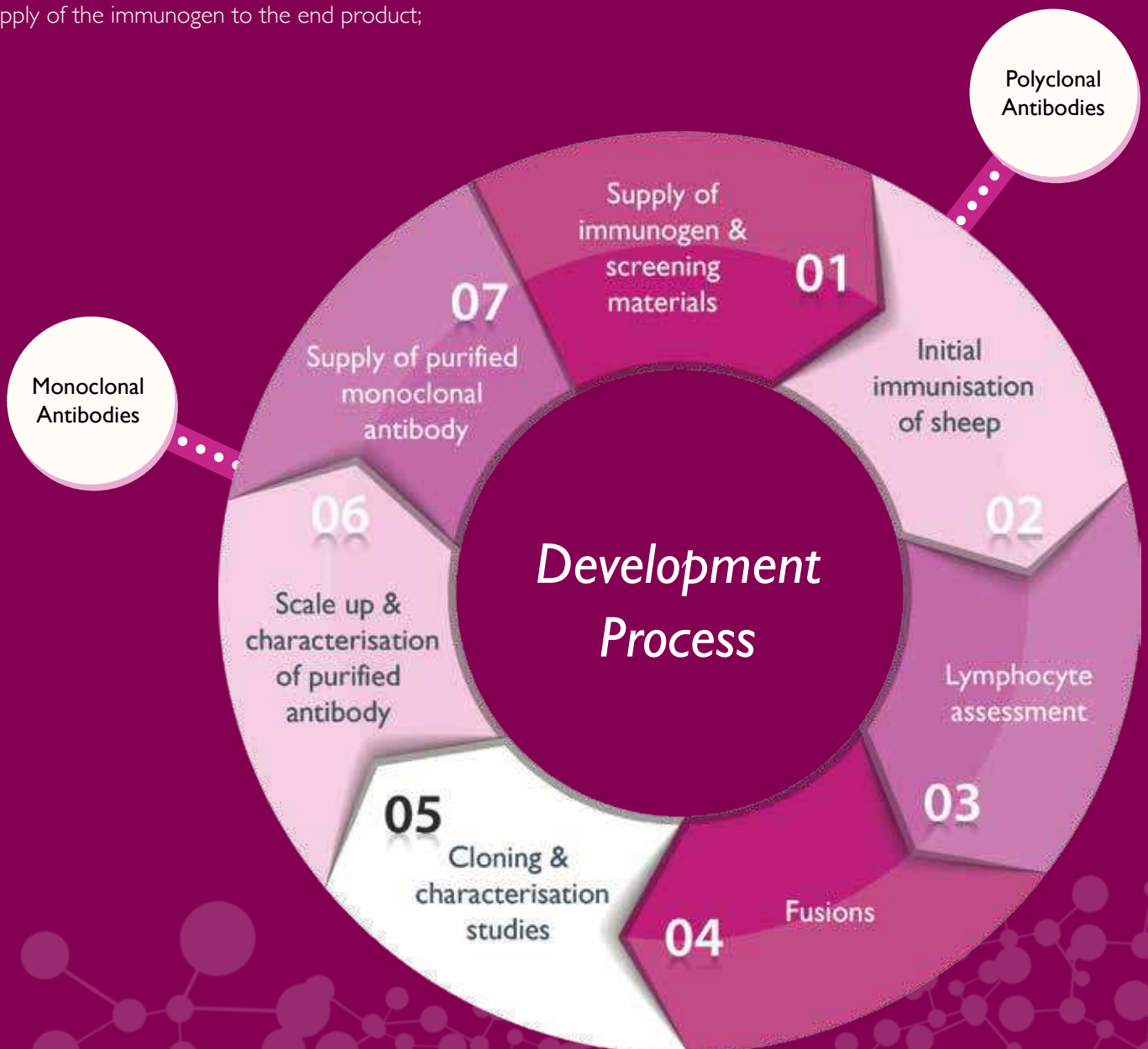
POLYCLONAL & MONOCLONAL ANTIBODIES

We have vast experience in polyclonal and monoclonal antibodies with a catalogue that currently includes over 500 polyclonal antibodies and 150 monoclonal antibodies covering a wide range of research areas;

Product Range



The diagram below explains the process we follow to develop our monoclonal and polyclonal antibodies from the initial supply of the immunogen to the end product;



Why choose Radox Biosciences?

All of our antibodies are developed in sheep due to the following potential advantages;

- A higher affinity than mouse monoclonal antibodies
- Better epitope recognition
- As sheep are naturally larger animals, we can develop much larger quantities of serum, offering better economies of scale

Other advantages of our antibodies

- Excellent sensitivities (i.e. low working concentration)
- High Ig concentration
- Excellent reproducibility between lot numbers
- Excellent specificity to target compound
- Detailed cross reactivity profiles
- Available for bulk purchase
- Stable when stored at -20°C
- Corresponding HRP labelled conjugates (tracers) available for immunoassay development



HUMAN RECOMBINANT PROTEINS

Randox Biosciences has a range of bacterial and mammalian protein expression services - complete solutions for your research and development needs.

Protein expression services include:

- Bioinformatic analysis and domain selection
- Subclone plasmid / construct expression vectors
- Sequence analysis and verification
- Bacterial cell transformation and clone preparation
- Protein expression and purification
- Optimisation of expression and purification conditions
- Quality control report
- Scale-up production
- Protein characterisation
- Protein lyophilisation

Features & Benefits:

- Carrier free
- Ready to use
- >95% purity
- Protein evaluation
- Western blot controls
- Stable for storage at - 20°C
- Undergo rigorous QC
- Bulk quantities available
- Contains a His-tag

In-house Recombinant Protein Expression Capabilities

Bacterial

- E.Coli
- Fast doubling time (20 min)
- High expression levels
- Soluble/Insoluble protein
- No Post Translational Modifications (PTM)

Protein Conformation:

- Simple primary structure

Mammalian (human)

- Human cell
- Doubling time (48-72 hrs)
- Moderate expression levels
- Soluble protein
- Post Translational Modifications (PTM)

Protein Conformation:

- **Glycosylation – human**
- **Sialylation (improved stability)**
- Complex quaternary structure

Radox Biosciences have a range of recombinant proteins available specific to a wide range of biochemical markers including;

Cytokines

*Tumour
Markers*

Proteases

Chemokines

*Adhesion
Molecules*

Our scientists have extensive experience in producing human recombinant proteins that are employed in our own diagnostic kits used throughout the world.



To order or request custom
Antibodies & Recombinant Proteins visit:
www.randox-lifesciences.com



RANDOX
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