Syngene

Putting Science to Work

# Accelerating Your Success in Antibody Discovery and Engineering

## Putting Science to Work for Next-Generation Biotherapeutics

- Multiple discovery routes under one roof, faster from idea to candidate
- Engineering depth (bispecifics, VHH) with robust analytics (SPR, LC-MS, nanoDSF, SEC-HPLC)
- Smooth hand-offs to cell-based assays and in vivo studies
- Discovery options matched to target class: hybridoma/B-cell, display (Fab/scFv/VHH), rabbit/peptide, and cell immunization
- Rapid triage: many hits to few leads with cellular binding or function
- Project governance: a single PM, weekly checkpoints, documented go/no-go gates

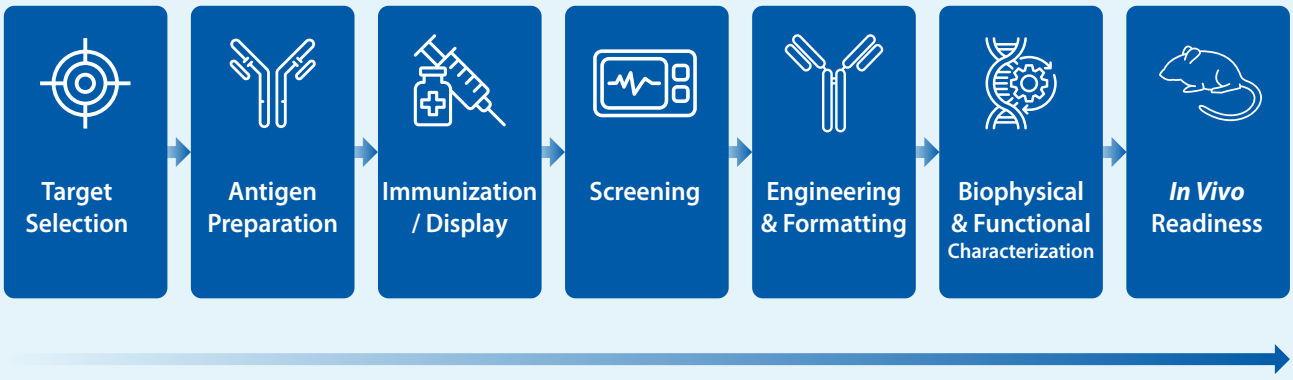
# End-to-End Antibody Discovery Services for Biotherapeutic Innovation

Syngene offers comprehensive antibody discovery and engineering services designed to accelerate the development of next generation biotherapeutics. Leveraging a suite of flexible discovery platforms, including hybridoma, B-cell, phage/yeast display, and proprietary SynCam™ naïve camelid VHH libraries, Syngene delivers high-quality antibodies with speed and precision.

Clients benefit from rapid triage of hits to leads, robust project governance, and integrated add-on services such as early developability assessment, epitope binning, and advanced engineering for bispecifics and VHH formats.

With end-to-end capabilities spanning target selection, immunization, screening, engineering, and analytics, Syngene ensures a seamless path from idea to *in vivo* ready lead, supported by decision-grade data and expert project management.

## Integrated path to an *in vivo* ready lead




## Capability highlights

- Hybridoma & B-cell discovery (Alloy mice)
- Phage/yeast display & SynCam™ naïve camelid VHH library (~$5\times10^9$ CFU)
- Rabbit, peptide, and cell immunization (incl. neonatal tolerization)
- Bispecific platforms: SyngFab™ (Fab×scFab) and SyngBody™ (Fab×Fab)
- High-throughput VHH expression and analytics

## Add-on services

- Early developability review (liabilities/PTMs/aggregation)
- Epitope binning & competition mapping for pairing and bispecific design
- Humanization/Fc engineering/ isotype switching (on request)



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# Core Discovery Platforms and Antigen Strategies

## Hybridoma & B-cell platforms (Alloy mice)

- Campaigns up to ~4000 hybridomas, parallel B-cell sorting runs
- ELISA primary → cell-based secondary to confirm native cell binding
- Typical outcomes from recent runs: 5–10 unique sequences with cellular binding

## Rabbit & peptide immunization (for tough targets)

- Effective for low-homology, intracellular, or nuclear targets
- Case evidence: 16 antibodies validated across ELISA, Western, and IHC

## Cell-based & neonatal immunization

- For membrane or tolerance-sensitive epitopes, neonatal tolerization helps break tolerance
- Representative result: 9 binders out of ~1401 monoclones by flow cytometry

## Antigen formats we support

- Recombinant proteins (domains/full-length), carrier-conjugated peptides, and stable cell immunogens
- Adjuvants tuned to immunogenicity goals (e.g., Freund's in peptide case)
- Early antigen QC (purity/concentration/aggregation) to protect campaign outcomes

## Practical client value

- Choice of route per target risk profile
- Early cell-binding confirmation to avoid false positives on recombinant antigens

# Phage/Yeast Display & SynCam™ VHH Library

## SynCam™ naïve camelid library (VHH)

- ~$5\times10^9$ CFU, ~98% in-frame; validated binders against PD-1, CDH17, and CD80
- Designed to find stable single-domain binders for therapeutics, diagnostics, and imaging

## Display toolkit

- Phage/yeast display in Fab, scFv, VHH formats
- Affinity maturation: chain shuffling, CDR mutagenesis, error-prone PCR

## Representative outcomes (from recent programs)

- **Anti-Target-2 hybridoma run:** 4000 clones →101 ELISA binders (~2.5%); 57/101 showed co-stimulation synergy; strong activity observed in bispecific format
- **Anti-idiotype program:** 31 unique sequences identified →blockers (4), partial (2), non-blockers (25) with serum tolerance
- **Peptide campaign:** 132 supernatants by flow →18 specific binders

## Practical client value

- Higher probability of functionally useful binders on challenging targets
- Rapid VHH cycles for concept testing and imaging programs



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# Engineering, Developability, & Bispecific Platforms

## Bispecific platforms

- SyngFab™ (Fab×scFab) and SyngBody™ (Fab×Fab) for modular 1:1 or 2:1 designs
- Stable scFv, including cysteine-stapled constructs; tested designs show >95% heterodimer at first-capture

## Early developability

- Sequence liability scan (deamidation, isomerization, glycosylation motifs)
- Polyreactivity checks and aggregation/charge profiling to reduce late surprises
- Reformatting into IgG/bispecific scaffolds with manufacturability in mind

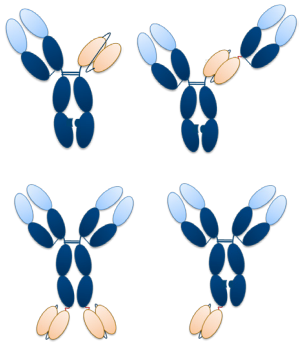
## Characterization that matters

- SPR (KD/ka/kd), nanoDSF (Tm/aggregation onset), SEC-HPLC (size profile), LC-MS (intact mass/variants)
- Cell-based potency (where relevant) and in-vivo xenograft models for advanced programs

## Practical client value

- Earlier "fit-for-purpose" molecules for scale-up and IND-enabling planning

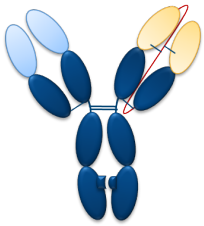
## Syngene's bispecific platforms



### scFv based bispecific antibody platform

(Engineering antibody variable domain in stable scFv format

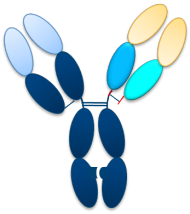
- Expertise in generating stable scFv binders
- Cysteine stapled highly thermostable scFv
- Re-formatting in multiple designs
- Plug and play multi-valancy and multi-specificity platform
- Platform has FTO



Syngene's Proprietary

### SyngFab platform Fab x scFab

- Improved scFab design with novel engineered linker
- High thermostability
- Tested across multiple sequences with >95% heterodimer formation at first step capture.



Syngene's Proprietary

### SyngFab platform Fab x Fab

- Proprietary approach for light chain and a heavy chain assembly.
- Work in progress..



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# Nanobody (VHH) Discovery, Expression & Analytics

## VHH (Variable Domain of the Heavy Chain)

- Compact, stable, engineerable: ideal for bispecifics, imaging, and hard epitopes

## High-throughput expression & analytics

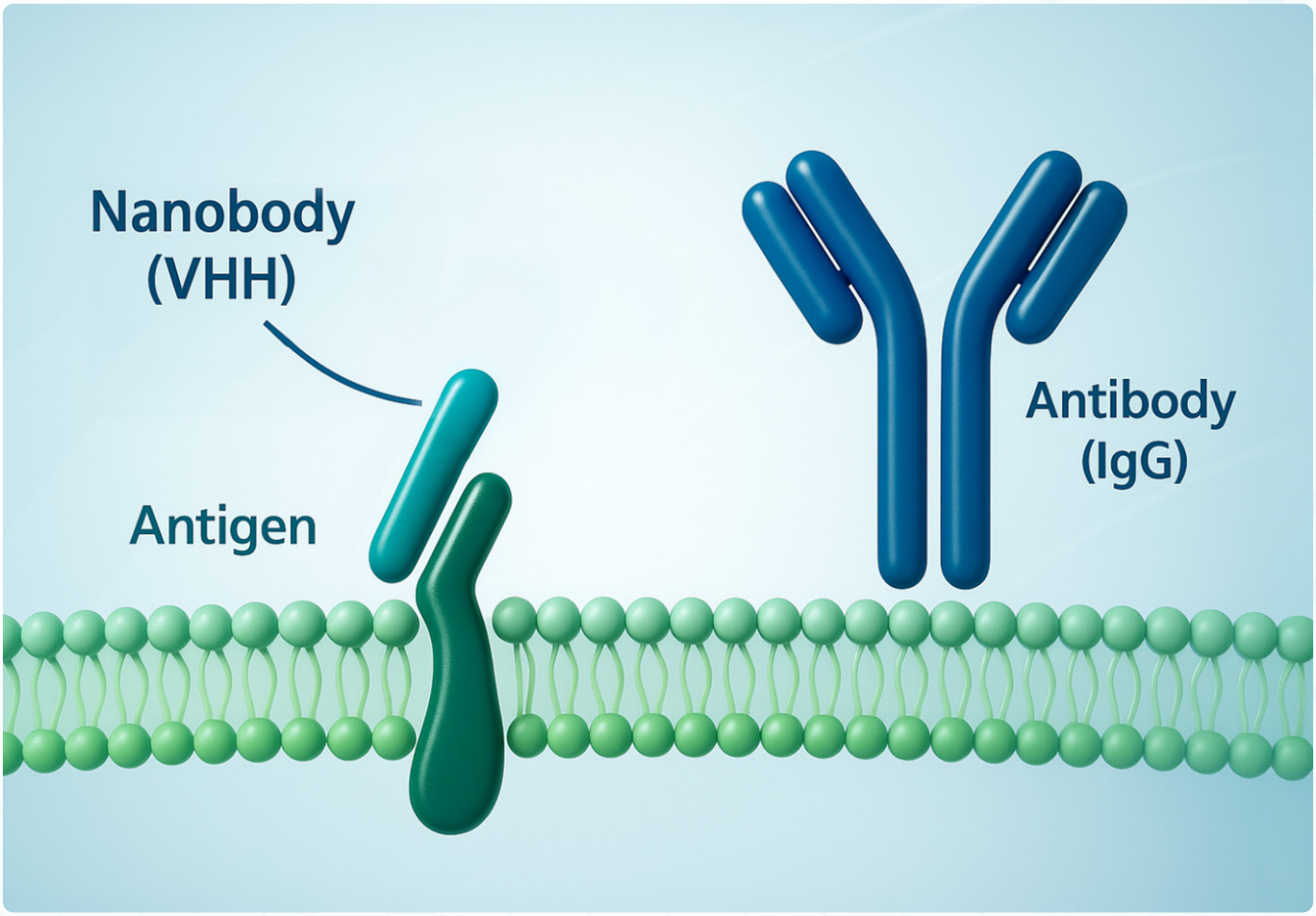
- Hosts: Pichia pastoris, ExpiCHO-S, and mammalian systems
- Typical small-scale titers ~60–700 mg/L; IMAC/Amsphere purification
- Example HTP program: 235 VHH-Fc constructs expressed → 145 shortlisted across human/cyno/SNP variants → 48 blockers identified (thermal melt and KD panels delivered)

## Rapid data package

- Binding tables (ELISA/flow/SPR), thermal stability curves, intact mass (LC-MS), pH-dependent KD
- Short TATs: ~8–13 days for expression/purification/analytics in small-scale screens

## Practical client value

- Fast go/no-go on many VHH variants
- Early blocker/non-blocker classification to guide functional assays



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# Analytics, Quality & Logistics

| Biophysical & functional panels | Quality & documentation | Sample & shipment basics | Practical client value |
|---|---|---|---|
| • SPR: affinity, epitope binning, cross-reactivity; ~1–2 weeks method setup typical nanoDSF: unfolding transitions and aggregation onset; buffer scouting for stability windows<br>• SEC-HPLC: monomer % and size distribution; LC-MS: intact mass/variants<br>• Cell-based assays: target-expressing lines for binding/function readouts | • Data integrity, instrument qualification/ maintenance logs<br>• Milestone reports for governance teams; clean tech-transfer packs on request | • Acceptable immunogens: proteins (with spec), carrier-linked peptides, stable cell lines<br>• Guidance on concentration/buffer/ shipping to protect antigen integrity | • Decision-grade dossiers that reduce internal review friction<br>• Ready-to-file method notes for future reuse |

# Program Timelines and Our Approach

## Indicative timelines (program dependent)

- VHH-Fc expression + basic analytics: ~1–2 weeks
- Variant generation in ExpiCHO (<50 mL): ~6–8 weeks (excluding gene synthesis/subcloning)
- Bespoke immunization or display campaigns: scoped at kickoff with milestone map

## Governance

- Single PM contact; weekly cadence; documented decision checkpoints
- Shared data room, standardized slide/report templates, clear down-select memos
- IP per MSA/SOW; FTO considered in platform selection where applicable

## Next step

Let's shape the right route for your target class and timeline.

**For more details, visit** www.syngeneintl.com
**or write to us at** bdc@syngeneintl.com



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# Notes



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## About Syngene

Syngene International Ltd. (BSE: 539268, NSE: SYNGENE, ISIN: INE398R01022) is an integrated research, development, and manufacturing services company serving the global pharmaceutical, biotechnology, nutrition, animal health, consumer goods, and specialty chemical sectors. Syngene's 6000+ scientists offer both skills and the capacity to deliver great science, robust data security, and quality manufacturing, at speed, to improve time-to-market and lower the cost of innovation. With a combination of dedicated research facilities for Baxter, and Bristol-Myers Squibb, as well as 2.2 million sq. ft of specialist discovery, development and manufacturing facilities, Syngene works with biotech companies pursuing leading-edge science as well as multinationals, including GSK, Zoetis, and Merck KGaA.

For more details, visit www.syngeneintl.com or write to us at bdc@syngeneintl.com



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