



The HUB of Biotherapeutic Intelligence™

In Vivo + In Vitro + In Silico
Antibody Discovery and Development



Welcome Revolutionizing antibody discovery and development

IPA is a cutting-edge, scientific Contract Research Organization (CRO) for biotechnology companies.

We provide highly specialized full-service antibody discovery, development and through a powerful combination of wet lab and *in silico* technologies that provides greater efficiency and more accuracy than ever before.



The future of the modern lab

IPA philosophy

Collaborate: Operating as an extension of your lab by offering a comprehensive suite of end-to-end discovery services

Innovate: Current discovery is an evolving combination of state-of-the-art wet lab and *in silico* services

Educate: IPA is comprised of industry thought-leaders and continuously learning new technologies

Evaluate: A sequence is only valuable if it's functional.

Function-first data driven workflows produce sequences that accelerate efficiencies and enhance safety and efficacy.



End-to-end
antibody
discovery and
development
through a powerful
combination of
in vitro, *in vivo*,
in silico technologies.

Target
Validation &
Immunization

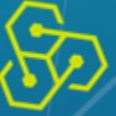
Function-First
Discovery

Enhanced
Biophysical
Characterization

Optimization
& Engineering

Immunogenicity
& Developability
Profiling

Research Grade
Manufacturing



Our expertise and insights drive performance across all antibody discovery applications.

IPA has the species, platform, engineering, and production to advance your therapeutics and critical reagents.

Therapeutic

Programs designed to produce panels of functionally diverse antibodies to identify truly unique lead candidates that are: functionally superior and compatible with proprietary scaffolds.

Diagnostic

From biomarkers to small molecules, IPA is highly skilled at producing antibodies with the required traits: no-cross-reactivity, low background, and enhanced detection.

Featuring Rabbit B cell Select®

Therapeutic Companion

Integral components of the drug discovery process with distinct roles and specifications.

Featuring Rabbit B cell Select®

Protein Manufacturing

Mammalian protein expression and purification services tailored to your needs. Small scale, high throughput to large batch scale for research and pre-clinical application.



EXPERIENCE ^{is} IPA

80% of top 20
pharma as clients

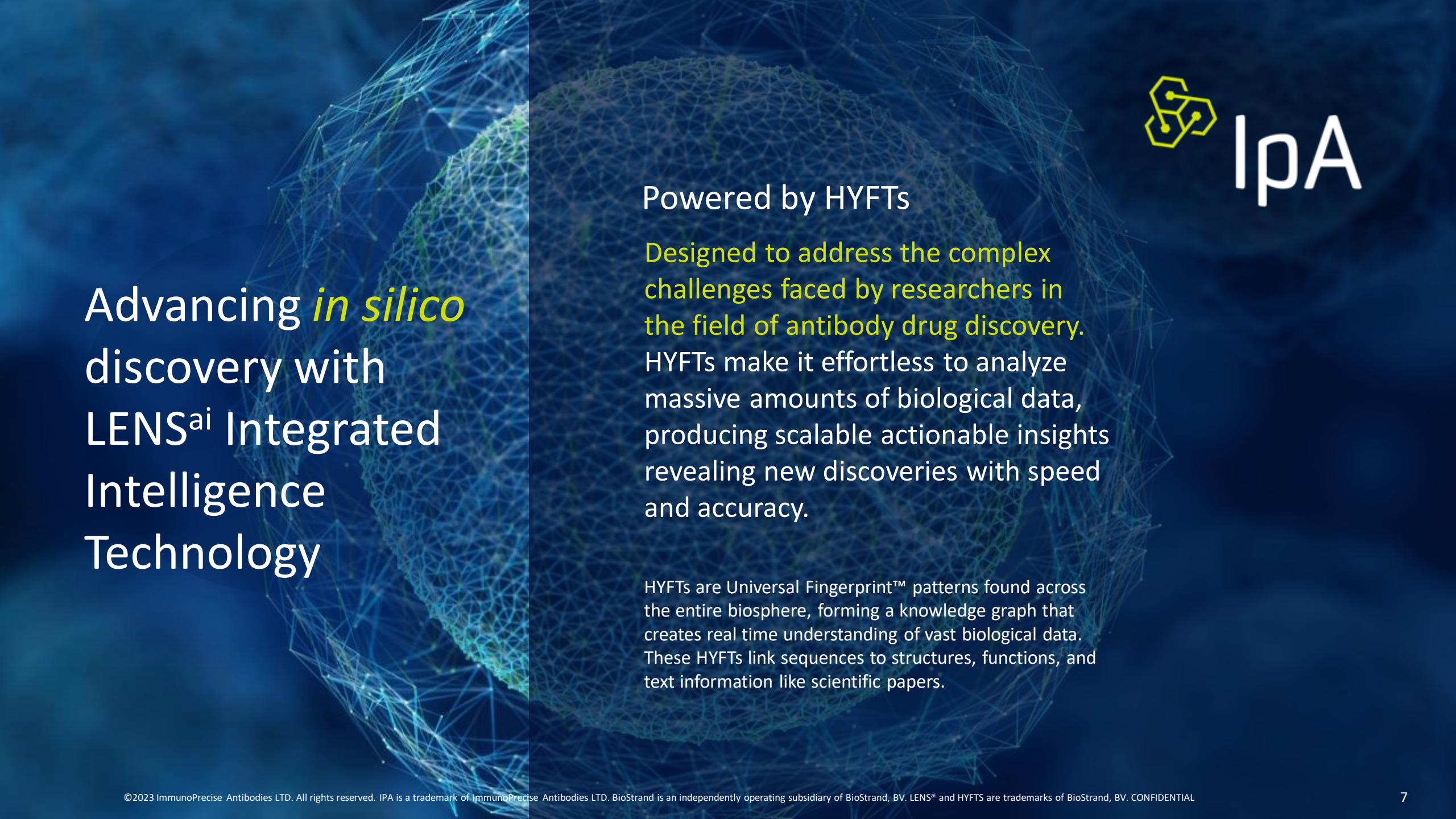
#1 globally
ranked antibody
discovery CRO

Total number of
monoclonal antibody
discovery programs

>2,500

Total number of
discovery programs
since 2020

>290



Advancing *in silico* discovery with LENS^{ai} Integrated Intelligence Technology



Powered by HYFTs

Designed to address the complex challenges faced by researchers in the field of antibody drug discovery.

HYFTs make it effortless to analyze massive amounts of biological data, producing scalable actionable insights revealing new discoveries with speed and accuracy.

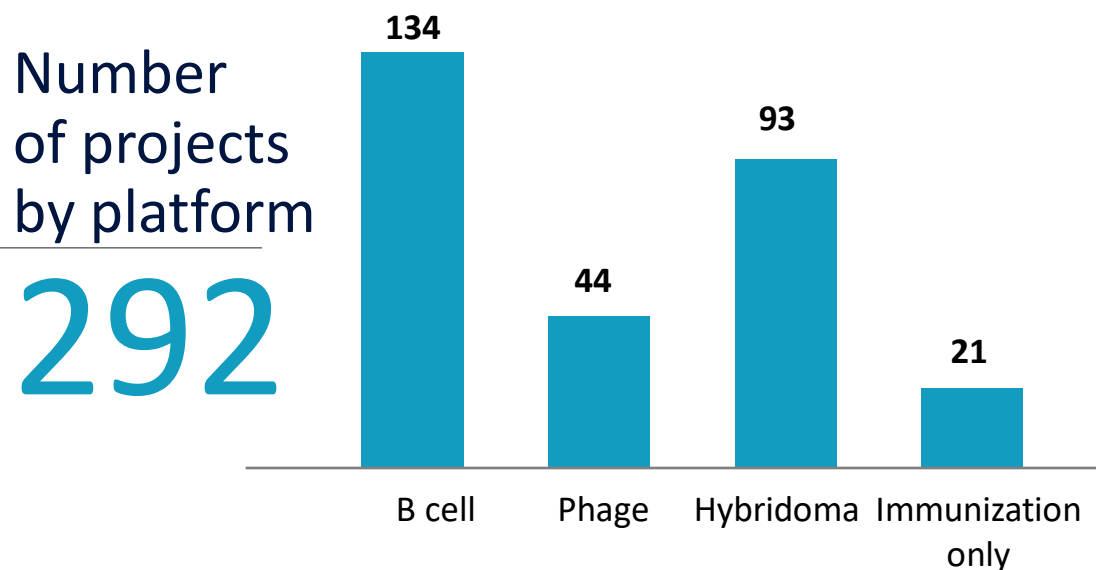
HYFTs are Universal Fingerprint™ patterns found across the entire biosphere, forming a knowledge graph that creates real time understanding of vast biological data. These HYFTs link sequences to structures, functions, and text information like scientific papers.

Discovery Programs Since 2020

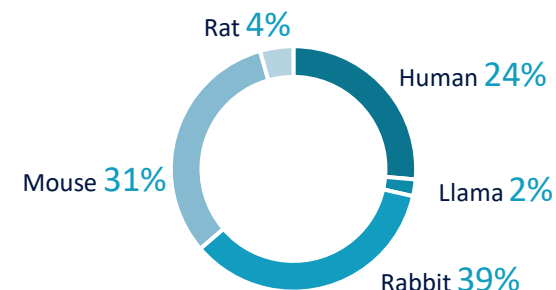
Diversity in design leads to successful outcomes



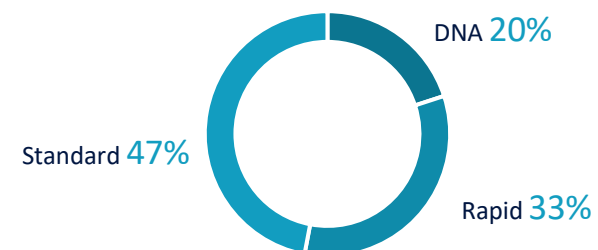
From GPCR targets to small molecules, IPA has the depth of offering, experience, and expertise required for your unique discovery needs.



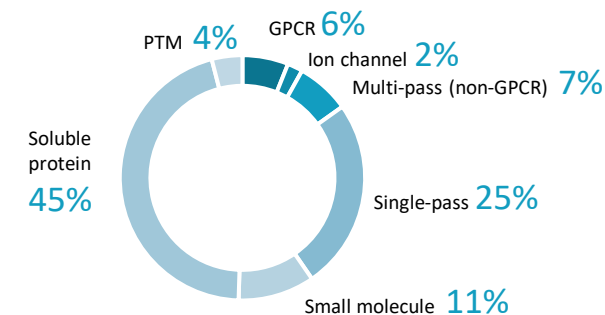
Species Breakdown



Immunization Schedule Breakdown



Target Category Breakdown

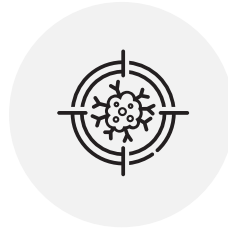


Target analysis, antigen design and tool generation

Superior outputs require superior inputs: Experience design and quality reagents

Target analysis & antigen design

In depth program analysis and assay design



In silico

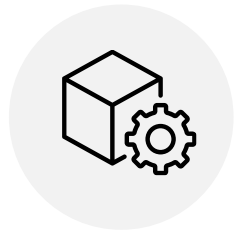
- Target discovery/validation
 - Cross-functional data set analysis
 - NLP target landscape
 - Variant calling
 - Off-target analysis
 - Structural modeling

In vitro

- Function-first, data driven screening triage
- Species cross-reactivity
- Custom functional assay set-up

Reliable tool generation

Critical for program success



In vitro

- Generation of target-expressing, stable cell line
 - HEK
 - CHO
- Expression of recombinant fusion proteins
- Synthesis of peptides
- Generation of target-encoding DNA

Immunization

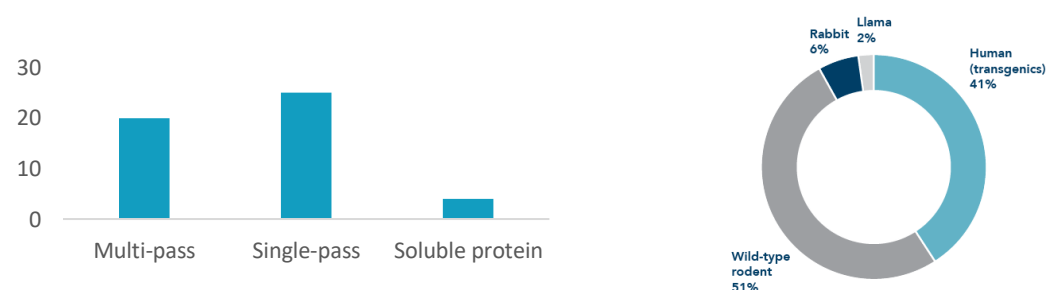
In-house vivarium and over 25 years of experience in performing immunizations for antibody discovery

DNA immunization technology – 35 -74 days

- Gene Gun
- Tattooing
- Hydrodynamic tail vein (HTV)

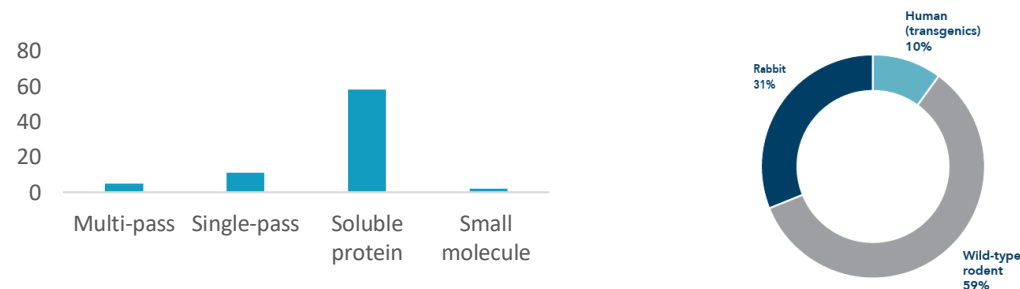
Program totals since 2020

Target category Species breakdown

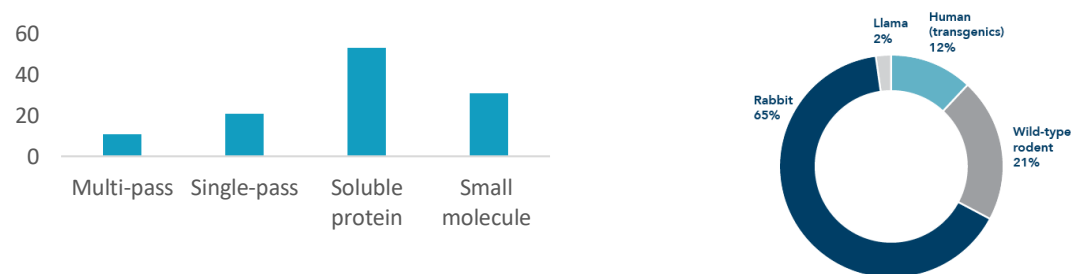


Rapid Prime® - 25 days

- Proprietary, fast, multi-site injection methods, tolerance breaking



Classical/custom immunization methods



Memory B cell Select[®]

Proprietary B cell culturing method with early functional screening data

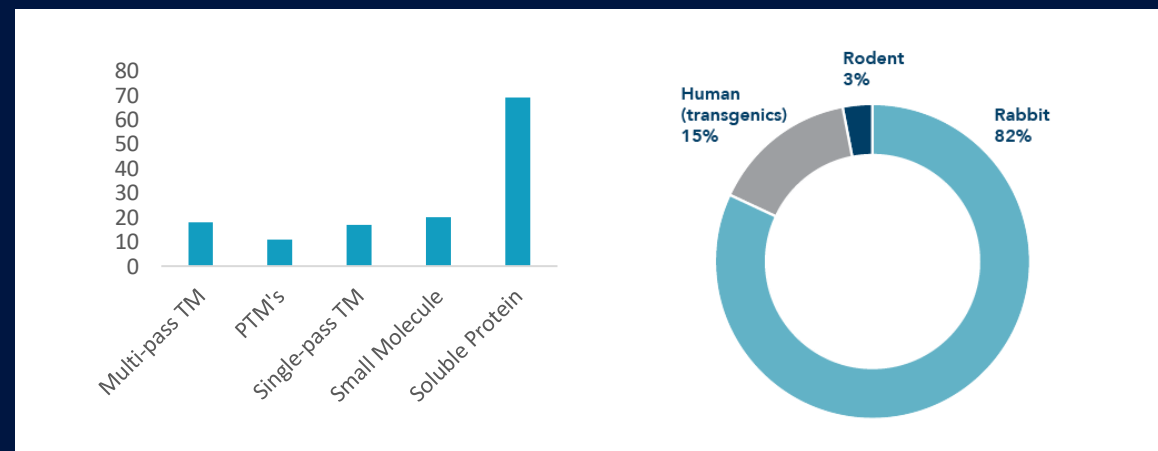
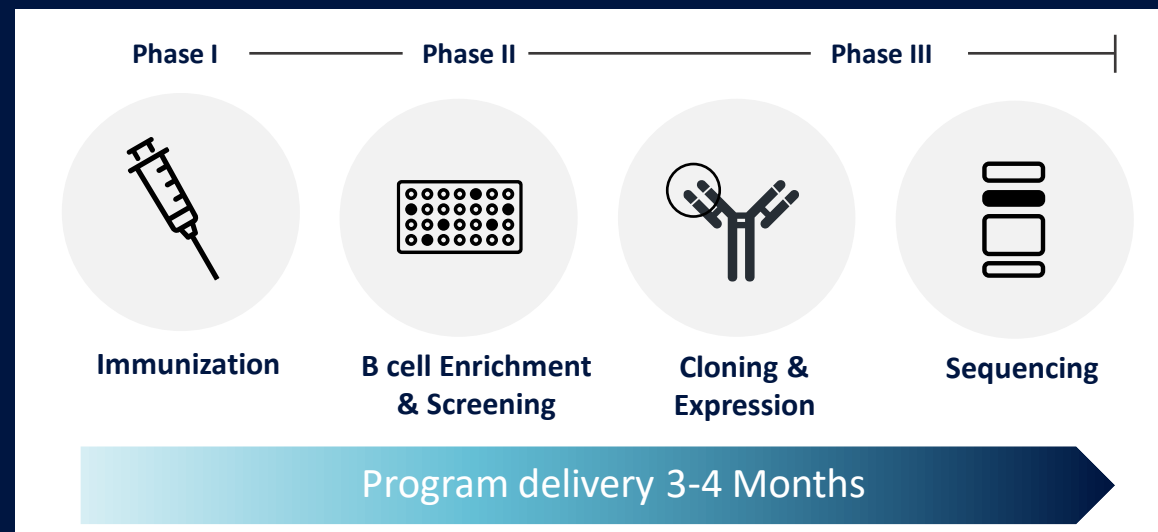


>135 programs since 2020

Success rate >98%

Available in a variety of species, including numerous transgenic strains

- Maintains native heavy- and light-chain pairing
- “Function First” - Early screening data from accessible primary B cell supernatant prior to sequencing
- Perform a combination of bio-assays in parallel
- Transient transfection to recapitulate functional profiles and produce purified materials
- Discovery solution for difficult targets (e.g. GPCRs)



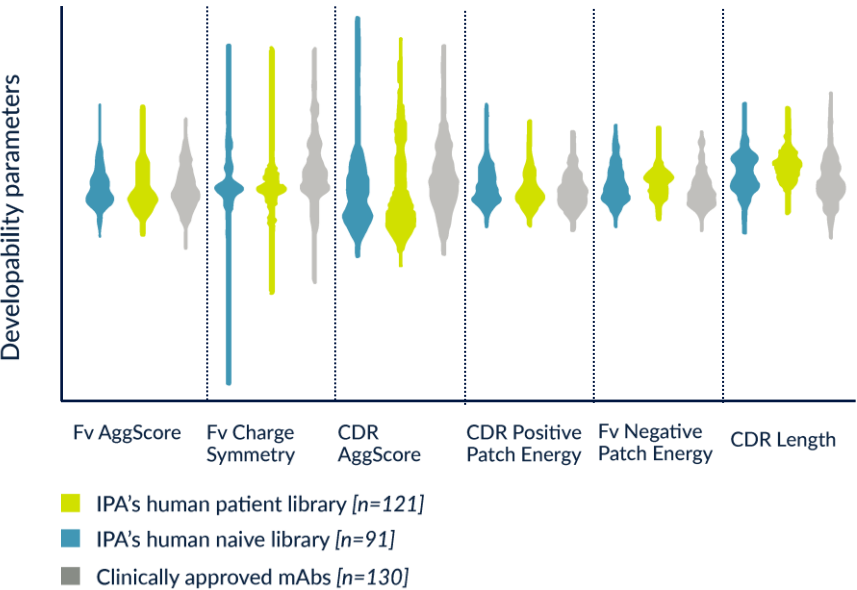
Phage

Start at advanced: Superior phage library candidate profiles eliminate need for molecular optimization



IPA's human library programs result in direct selection of target binders with *in silico* developability profiles similar to clinically approved therapeutic leads.

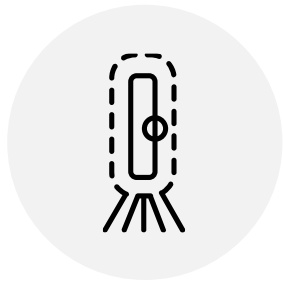
De-risking the drug development process



DeepDisplay™ - custom phage library



Display Library



In-house display library



Species	Format	Library size
Human Naïve healthy & diseased	scFv	10 ¹¹
Llama Naïve	VHH	>10 ⁹

Fully human antibodies in 8-10 weeks

- Expertise in cell-based panning(s)
- Rapid platform for CAR-T and bispecific discovery
- Re-formatting to full-size IgG or various isotypes
- Library based affinity maturation

Hybridoma

Rapid, cost effective, and reliable



> 93 programs since 2020

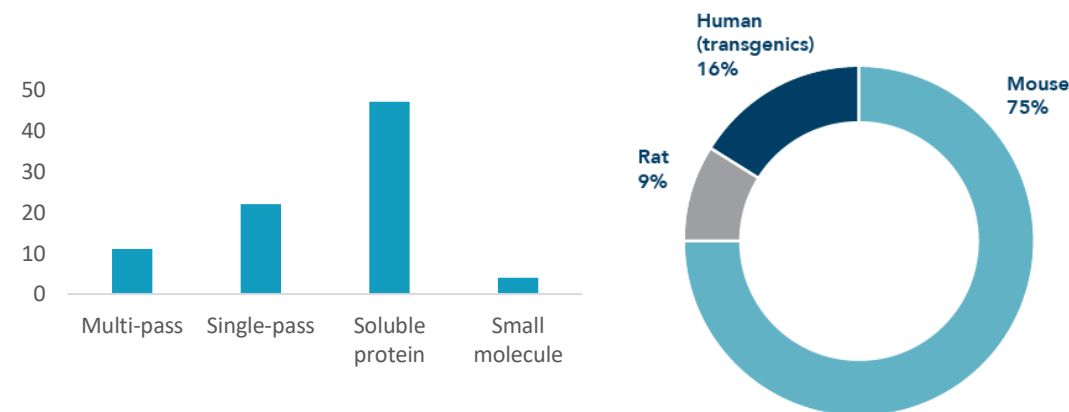
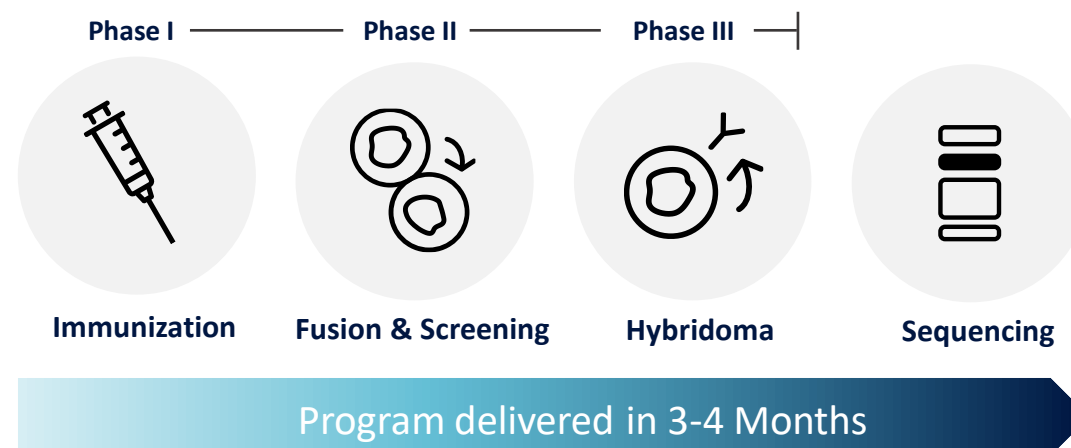
> 2000 programs total

Proprietary electro-fusion and hybridoma generation using semi-solid media and clone picking

- High-throughput, multiplexed screening methods
- Ability to screen of every clone with ample material
- Delivery of top clones either as subclones or parentals
- Amplicon-based NGS available prior to sub-cloning stage

Experience:

- 2,000+ programs completed
- High % clonal at primary screening stage
- Ability to proceed with NGS without subcloning





Repertoire Sequencing

Species agnostic repertoire sequencing

IPA can increase your lead candidate panel through the combination of our data driven discovery platforms, NGS repertoire sequencing, and LENS^{ai}™ complex intelligence clone selection.

In vitro

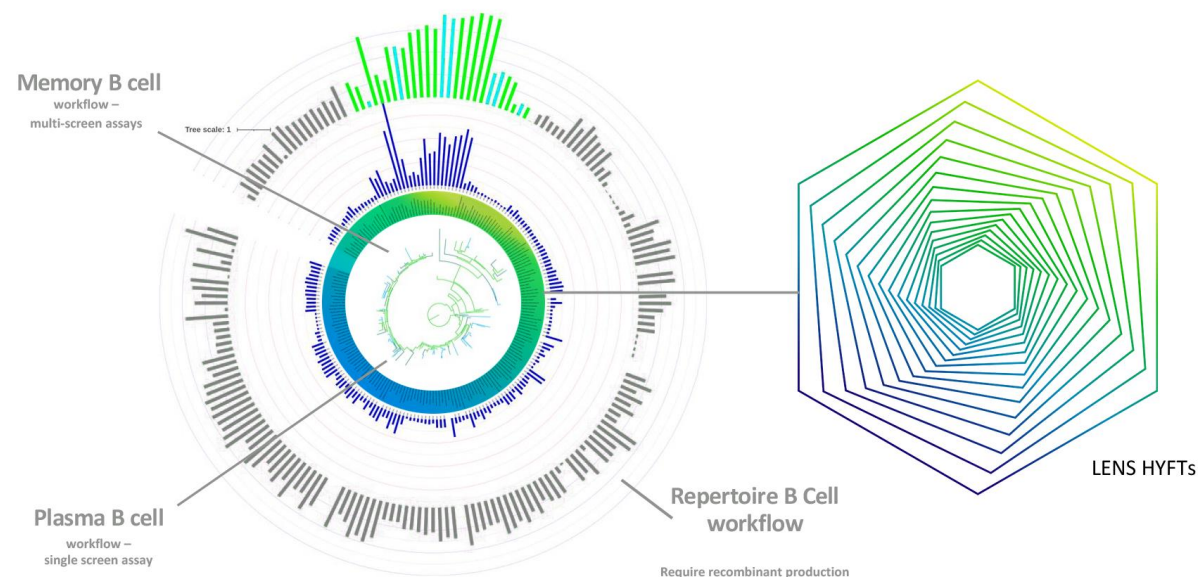
Library preparation

- Human
- Rodents
- Rabbit
- Camelid
- Chicken
- Camelids

In silico

- NGS repertoire analyses
- Functional antibody prediction

Maximize your data insight



Characterization

Data-driven informed triage and functional profiling

High throughput assays

ELISA

- Binding

Flow cytometry

- (Multiplex, binding specific, EC50, etc)

Label free biosensor

- (Binding, binning, off-rate ranking, KD, competition)

Mass Spec

Western blotting

HTRF

- Competition

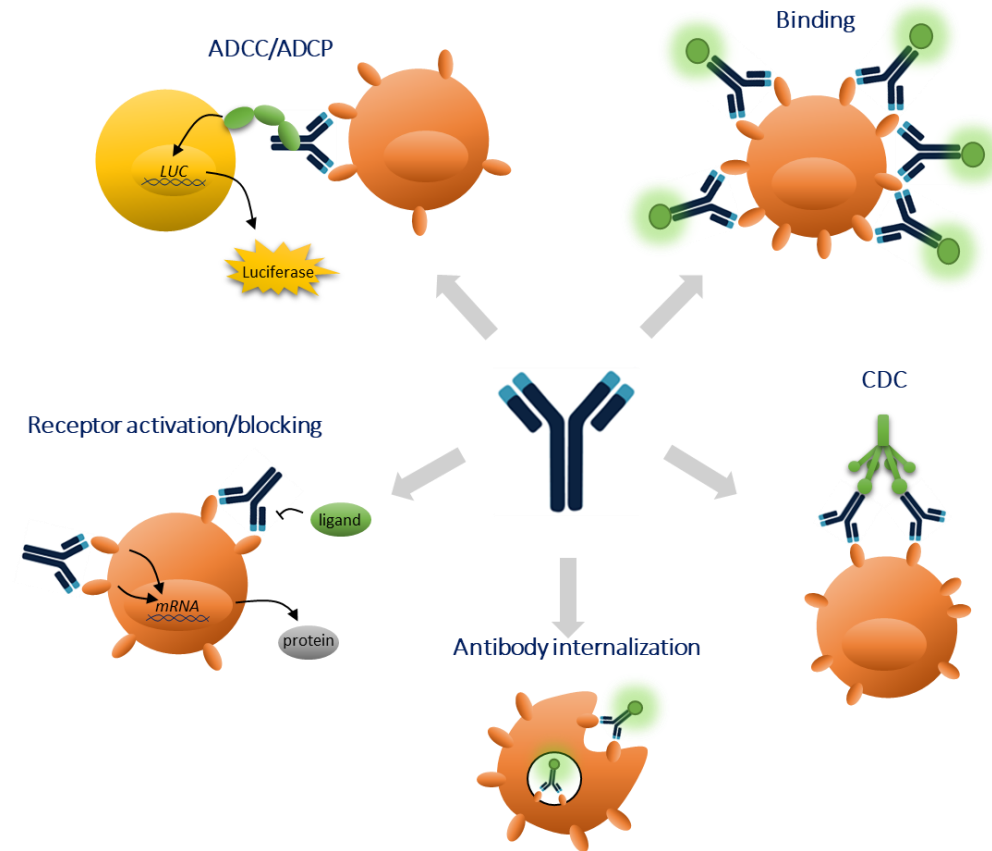
In silico analysis

- Developability/liability
- Immunogenicity
- Molecular dynamics

Developability

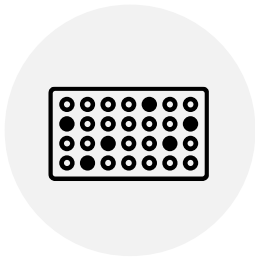
- Target specificity
- Poly reactivity
- SEC
- Aggregation
- Colloidal stability
- Poly Ig
- Hydrophobicity
- Charge properties
- mAb clearance
- Thermal stability
- Solubility
- Self interaction
- Diffusion interaction

Functional assays



Humanization

In-house expertise and *in silico* antibody engineering tool set



Lead candidate selection

Rodent
Rabbit
Chicken
Llama

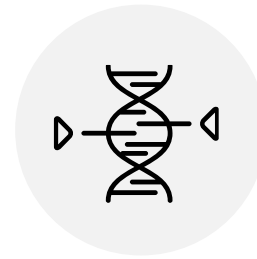
3-5 Lead candidates



In-silico humanization

Liability analysis
Immunogenicity

125 Variants



Gene synthesis & testing

Flow/ELISA/Octet
Wet-lab developability

125 Variants



Recombinant production & testing

Functional assay

48 Variants

Program delivery in 2-4 Months



Bispecifics

Bring us your scaffold and we can do the rest

Discovery

- Fab, scFv, VHH

Engineering

- Experience with >10 different bi-, tri-, and multi-specific scaffolds.

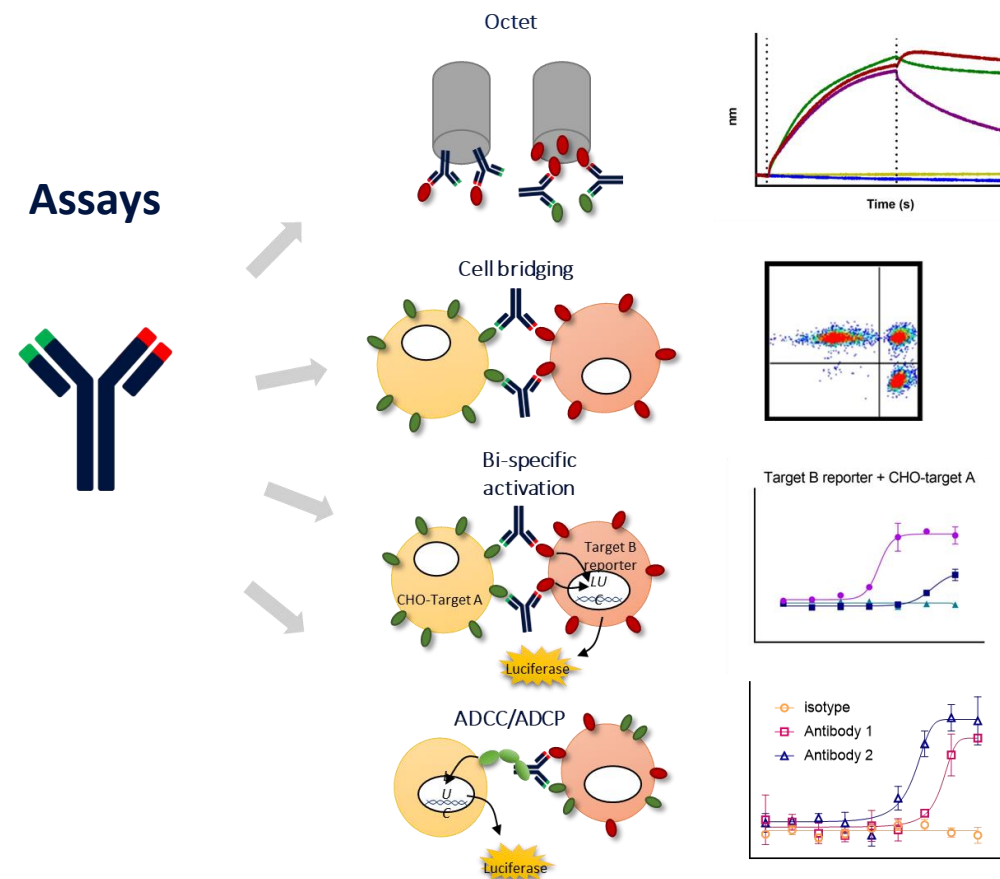
Characterization

- Octet
- Cell bridging
- Bi-specific activation
- ADCC/ADCP

Production

- >1250 individual production with different bi-, tri-, and multi-specific scaffolds.
- 10 mL to 20 L

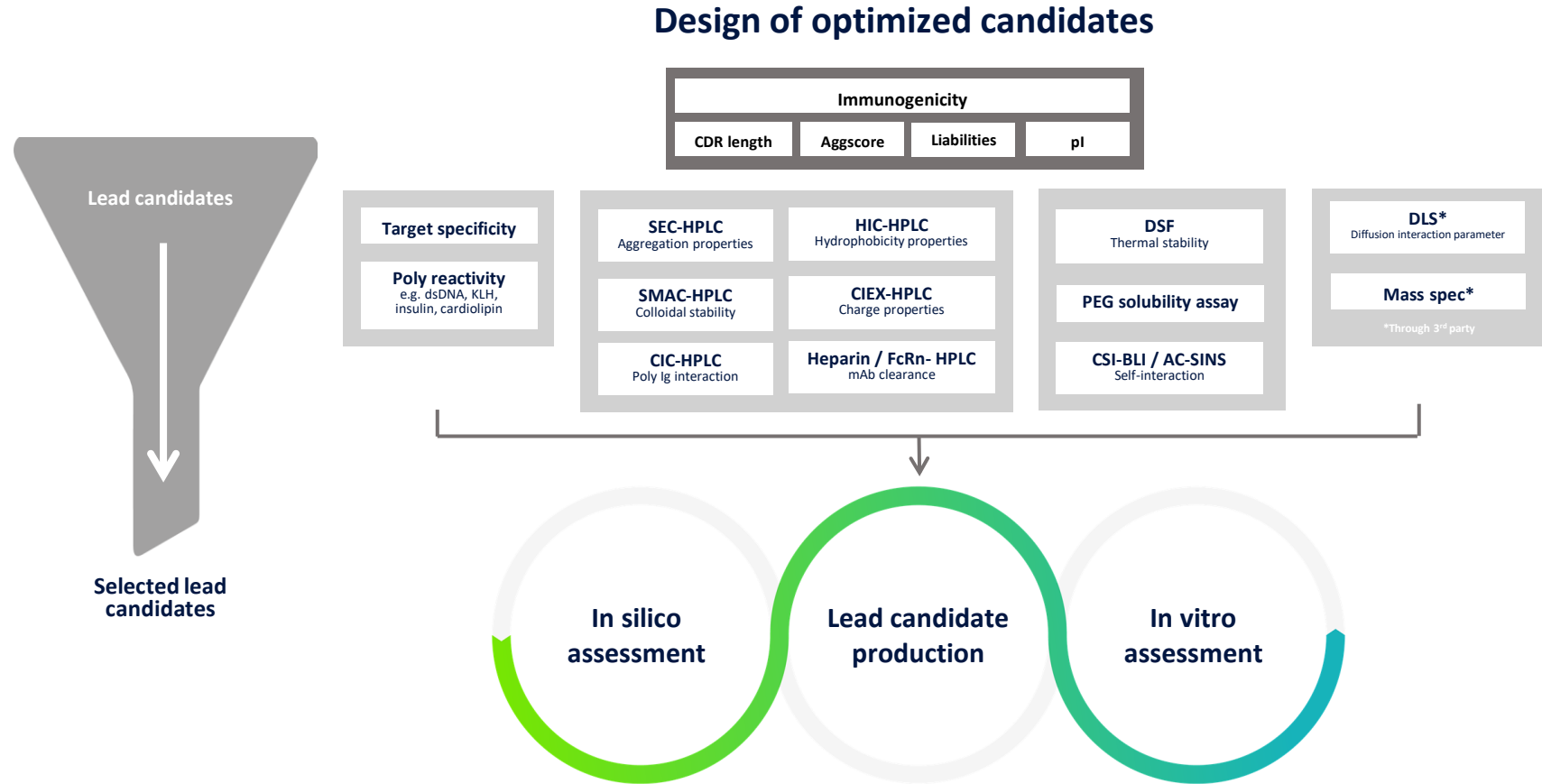
Assays



Developability Profiling

Mitigate risk and increase clinical success

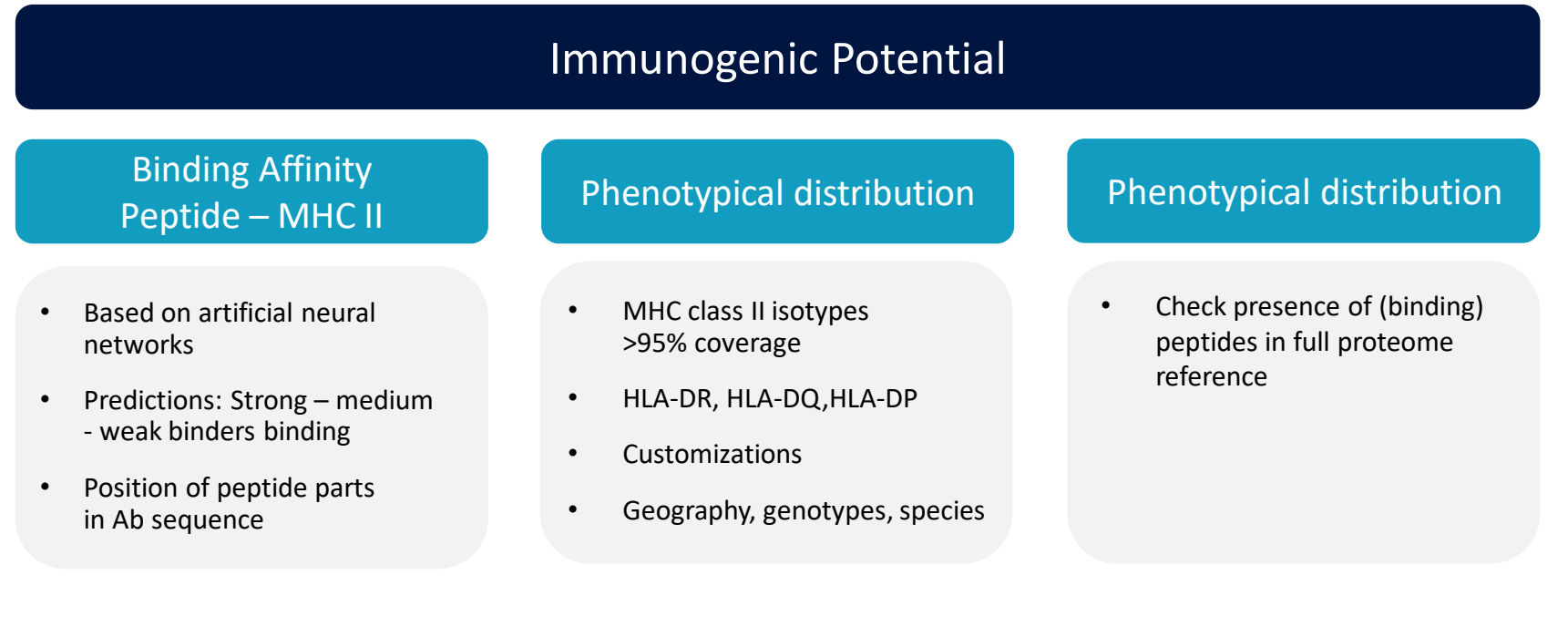
- Early candidate selection or post humanization
- Rank leads against 140 clinically relevant benchmarks



Immunogenicity

Unparalleled multi-level analyses and comprehensive reporting.

- Early candidate selection or post humanization
- Rank leads against >2000 clinically relevant benchmarks
- Service offered as yearly subscription or project-based.



Immunogenicity Composite Score

Research-grade Manufacturing

Experienced, reliable, high-quality custom production of difficult proteins

rPEX[®] Recombinant Protein Production

Workflow of large-scale transfection and protein purification



*<4 weeks for repeated batch production turn around time

Historical consolidated averages

Often includes difficult to express proteins

>6,361
productions

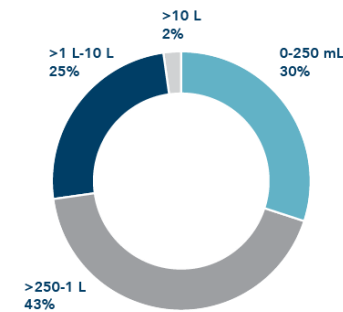
Average Purity
>95%

Average
Concentration
mg/mL
66.77

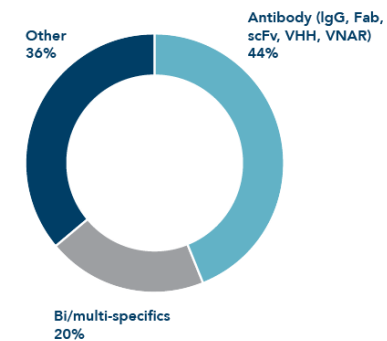
Average
Endotoxin
EU/mg
0.113

- Transient recombinant protein production
- Serum-free recombinant protein and antibody production in HEK293 and CHO

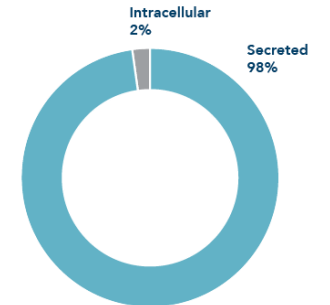
Scale



Protein type



Localization



Example: Wild-type therapeutic B cell program



Phase I — Phase II — Phase III —



Program delivery 6-8 Months



The possibilities are endless: more LENS^{ai} applications

Disruptive AI-driven biotherapeutic discovery potential

- Sequence similarity search and classification
- *De novo* sequence generation
- Integration of multi-omics data
- Benchmarking potential candidates
- Discover hidden candidates

Allowing unprecedented insight, accuracy, speed and efficiency.

Engineered for the race
and the shared pursuit
of clinical success

CONTACT

Dr. Barry Duplantis
VP of Client Relations

bduplantis@ipatherapeutics.com

www.ipatherapeutics.com



IPA-Canada

Vancouver Island
Technology Park
Unit 3204-4464
Markham Street
Victoria, British Columbia,
V8Z 7X8, Canada

IPA-Oss

Pivot Park –
Building OP
Kloosterstraat 9
5349 AB Oss
The Netherlands

IPA-Utrecht

Accelerator Building,
10th Floor
Uppsalalaan 17
3584 CT Utrecht
The Netherlands

