

Marketing and Design Intern  
Jun 2019 - Jun 2021

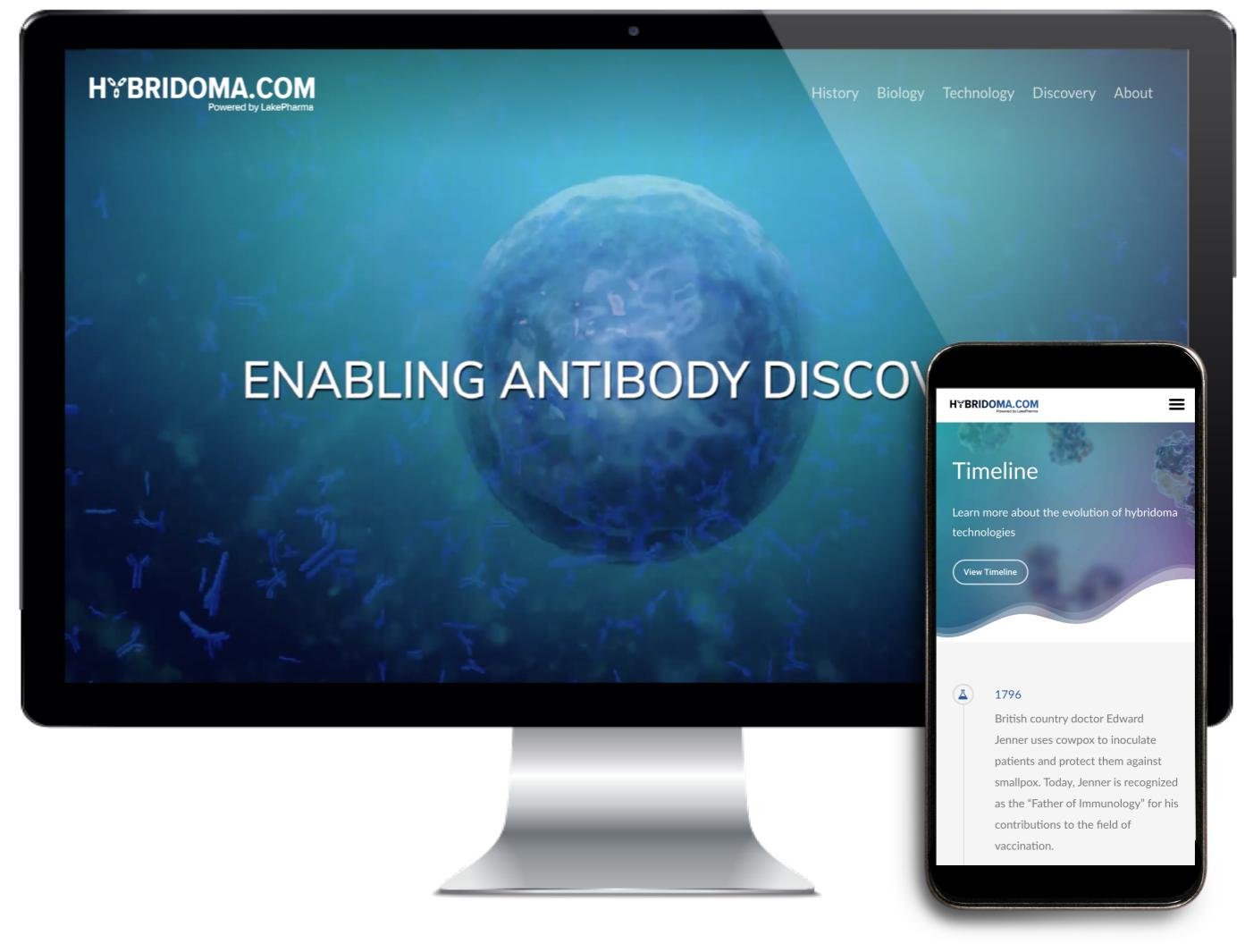
# LakePharma, a B2B pharmaceutical company.

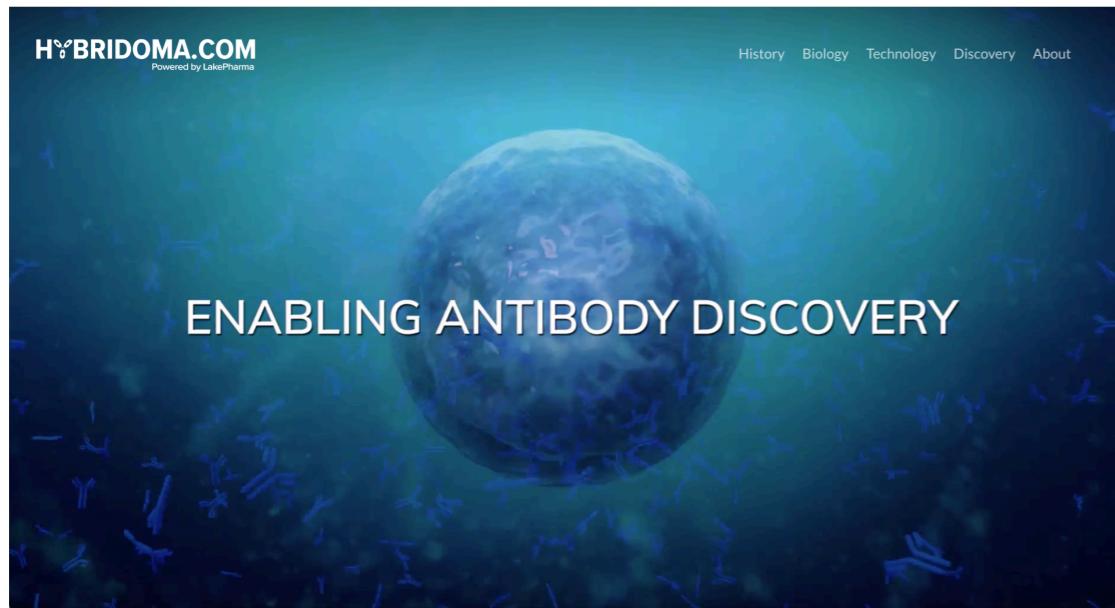
Goal: Promote and educate potential clients on LakePharma's hybridoma services with a new website brand for [hybridoma.com](http://hybridoma.com).

## Responsibilities:

### PM, Design, Developer

- Managed project timeline and priorities using a gantt chart
- Created designs, illustrations, and graphics using Adobe Illustrator and Photoshop, and homepage animation using Adobe Premiere and After Effects
- Solo developer of [hybridoma.com](http://hybridoma.com), using Wordpress, HTML, and CSS for desktop and mobile





## Antibody Structure

Along with the double helix of DNA, the distinctive Y-shape of an antibody is one of the most recognized structures in biology and perhaps all of science. There are five classes of antibodies in humans and rodents defined by their respective immunoglobulin (Ig) heavy chains: IgG, IgM, IgD, IgA, and IgE. Here we focus on IgG, as it is one of the most abundant proteins in human serum (10-20% of total plasma protein), comprises 70-85% of the total immunoglobulin pool, has the longest plasma half-life (20-24 days), and it is the most common format used in antibody-based therapeutics. IgG (~150 kD) comprises four peptide chains: two identical heavy chains and two identical light chains connected by disulfide (S-S) bonds. The heavy chain in IgG comprise ~450 residues. There are four IgG subclasses in human (IgG1, IgG2, IgG3, and IgG4), five in mice (IgG1, IgG2a, IgG2b, IgG2c, IgG3), and four in rats (IgG1, IgG2a, IgG2b, IgG2c). The light chain in IgG comprise ~215 residues, and there are two light chain subclasses in humans, mice, and rat:

## Success

- 01**  
The Discovery Immunology (DI) business unit has served 45 companies so far.
- 02**  
38% of our clients have returned to pursue additional DI Ab campaigns. 36% of our clients perform multiple campaigns in parallel.
- 03**  
We have completed 97 discovery campaigns through the hit identification stage.
- 04**  
We have successfully identified, confirmed, and cryopreserved multiple hits (non-clonal hybridomas) for 97% of our campaigns.
- 05**  
We have successfully single-cell cloned multiple hybridomas and determined unique mAb sequences for 55+ campaigns.

## Timeline

Learn more about the evolution of hybridoma technologies

[View Timeline](#)

## About Hybridoma.com

Hybridoma.com is developed by the scientists at LakePharma who are very passionate about discovering high performance antibodies using the hybridoma approach. Its goal is to serve as a reference source for researchers who are interested to learn more about hybridoma-based antibody discovery. If you have any questions, constructive feedback, corrections, or suggestions on improving this website, please do not hesitate to contact us.

**Policy Statement**  
LakePharma reserves the copyright over the materials produced. The use of information and images on this website is encouraged, but proper citation of this website is required.

## Contact Us

Questions, comments, or looking to partner?

Email\*

First name\*

Last name\*

Company name\*

Message

# Graphics

## Infographics

**Rodent Considerations for Hybridoma-Based Antibody Discovery**

Selecting the right host is critical when discovering novel antibodies using the hybridoma approach. Below is a quick comparison of commonly used rodents in antibody discovery campaigns.

**Transgenic Mice\***

**Advantages**

- Fully human variable regions (VH and VL domains)
- Reduced antigenicity preserves in vivo efficacy
- Improved developability (humanization not required/in vitro affinity maturation often not required)

**Considerations**

- Increased cost when compared with WT mice
- Licensing terms required
- Immune response can take longer to develop compared to WT mice
- If human/ mouse targets have high identity, or if mouse cross-reactivity is required, tolerance-breaking approaches likely needed

**Wildtype Mice**

**Advantages**

- Low cost: no terms, royalties, or milestones
- Proven, tried-and-true platform: most FDA-approved mAbs were discovered using WT mice

**Considerations**

- If human/mouse targets have high identity, or if mouse cross-reactivity is required, tolerance-breaking approaches likely needed
- Proven, tried-and-true platform: most FDA-approved mAbs were discovered using WT mice

**Target Knock-out Mice**

**Advantages**

- A preferred option if mouse/human share high identity, or if mouse cross-reactivity is required

**Considerations**

- For therapeutics applications, Ab reformatting and/or humanization might be required
- Depending on the function of the target gene, KO mice may have impaired adaptive immune responses, hindering *in vivo* Ab generation

**Wildtype Rats**

**Advantages**

- Low cost: no terms, royalties, or milestones
- A preferred option if mouse cross-reactivity is required
- Rat B cells are compatible fusion partners with LakePharma's myeloma cell line

**Considerations**

- For therapeutics applications, Ab reformatting and/or humanization might be required
- Rat immunizations require 4x as much antigen per animal as mouse immunizations.

To learn more about hybridoma-based antibody discovery services, please visit: [lakepharma.com/hybridomas](http://lakepharma.com/hybridomas)

## Flyer Layouts

**LakePharma**  
The Biologics Company

**Single Domain Antibody Libraries**

LakePharma has partnered with Twist Biopharma, a division of Twist Bioscience, to offer single domain antibody libraries as part of the antibody discovery and engineering services.

**Three Single Domain Antibody Libraries**

**VHH Ratio**  
Specific oligo pools model the natural VHH repertoire

**VHH Shuffle**  
Natural llama CDR sequences in the context of a llama consensus framework

**VHH hShuffle**  
Natural llama CDR sequences in the context of a partially humanized VHH framework

**Highlights**

- Small & modular antibodies
- Stable & robust
- Easier to engineer & manufacture
- Access to epitopes that are usually sterically hindered by an IgG
- Create building blocks for bispecific antibodies
- Off-the-shelf libraries ready for screening

**Proof of Concept Data**

ELISA + Colony Count 1 x 384-Well Plate Picked per Library per Round

Library	Round 3	Round 4	Round 5	Uniques
VHH Ratio	58	85	188	47
VHH Shuffle	128	211	287	58
VHH hShuffle	82	222	255	56

Array SPR Binding Analysis

CDR3 Length Distributions

Anti-TIGIT clones from VHH libraries encompass a range of affinities and diversity

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## Email Signatures

Save the Date - October 10, 2019

**LakePharma Symposium on Next-Generation Therapeutics**

**Register**

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The Biologics Company

An educational portal dedicated to hybridoma technologies -

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## Icons

