

# Gene Search

## Introduction:

Enhancing a gene-search tool catering to over 20 million genes across several product categories. The project aimed to address complexities in the existing search tool, leading to a more streamlined and user-friendly experience.

### The Problem:

The original gene-search for a small business faced challenges with a front-heavy search process born out of data archived from several different public databases keying off of different identifiers. The superset of IDs caused user confusion and incomplete transactions. Often, a user might be familiar with one particular ID and not others. Additionally, the subsequent modifiers to the search were required but confusing, often resulting in zero returns. The goal was to simplify the search and improve user engagement, ultimately driving increased access to product information.

### Users & Audience:

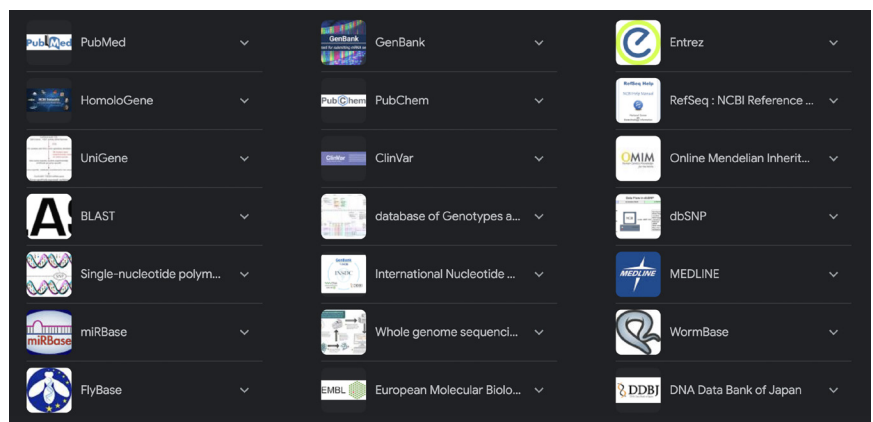
The primary users included researchers, scientists, and professionals in the field of genomics and drug discovery seeking specific gene-related products. Understanding their needs and frustrations was crucial for designing an effective solution.

### Roles & Responsibilities:

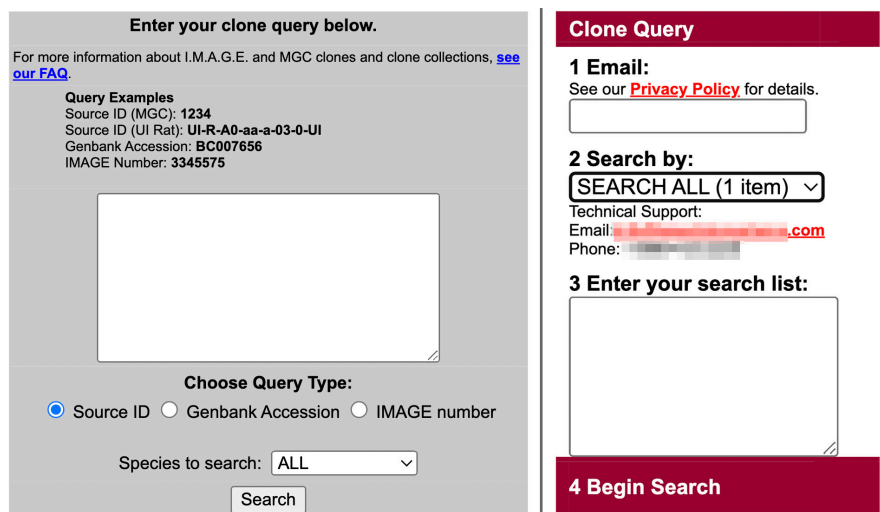
As the Lead UX Designer, I spearheaded the project in collaboration with the lead programmer and database administrator. The team size and composition was small but nimble, ensuring a comprehensive but targeted approach to address the primary design and technical aspects. Unique factors included stakeholder skepticism and the need to demonstrate user understanding before moving forward with the update.

### Scope & Constraints:

The project scope encompassed redesigning the search process for gene-related products. Constraints included skepticism from stakeholders about user understanding, necessitating a data-driven approach to showcase user challenges and validate the new solution.



The number of available databases for genomic information is large and quite diverse in implementation.



When the gene search only had three choices (left) it was fairly simple to use as more databases were added (eventually over 20) the complexity began interfering with sales directly. A stop-gap of Search All was added, but this resulted in additional confusion and poor results (right)

## What Happened:

Eliminating the need for users to specify legacy database IDs was the crucial first step. However, we needed to address a skeptical group of internal stakeholders made up of scientists familiar with the legacy IDs and unconvinced that we could discern user intent. I created a data-driven research brief, linking customer search data to purchases and incomplete transactions, showcasing user struggles with unfamiliar form elements, and demonstrating that they were putting in what they thought the identifier should be and not the ID we were expecting them to use. I also meticulously mapped user intent to proper search parameters, creating a comprehensive guide for the new search tool and a clear map for stakeholders. Finally, I conducted prototype testing with customers, gathering valuable feedback to refine and enhance the working prototype.

customerNo	timestamp	searchTerm	database	result	sequen
12918891	2022-01-01 9:00:00	TP53_gene	NCBI	Found	TP53_sequ
53177219	2022-01-01 9:15:00	BRCA1_gene	Ensembl	Found	BRCA1_se
93187070	2022-01-01 9:30:00	EGFR_protein	GenBank	Found	EGFR_seq
89809136	2022-01-01 9:45:00	LGALS3_Accession	Unigene	Found	LGALS3_se
87433770	2022-01-01 10:00:00	FOXO3_gene	Entrez	Found	FOXO3_se
18030571	2022-01-01 10:15:00	MYC_Accession	cloneBase	Found	MYC_sequ
93058994	2022-01-01 10:30:00	TP53_gene	Ensembl	Found	TP53_sequ
81376072	2022-01-01 10:45:00	EGFR_gene	GenBank	Found	EGFR_seq
93254085	2022-01-01 11:00:00	BRCA2_WormBase	Found	Found	BRCA2_ex
18122749	2022-01-01 11:15:00	MYC_FlyBase	Found	Found	MYC_expre
93038617	2022-01-01 11:30:00	ATM	NCBI	Found	ATM_seque
23022223	2022-01-01 11:45:00	MAPK1	Ensembl	Found	MAPK1_se
83737119	2022-01-01 12:00:00	Lysosomal_acid_lipase	GenBank	Not Found	Not Found
10879940	2022-01-01 12:15:00	AKT1	Unigene	Found	AKT1_sequ
77990306	2022-01-01 12:30:00	P53	Entrez	Found	P53_seque
79256677	2022-01-01 12:45:00	JAK2	cloneBase	Found	JAK2_sequ
37469492	2022-01-01 13:00:00	Arabidopsis_GLIP1	NCBI	Found	Arabidopsis
74892210	2022-01-01 13:15:00	Insulin_markers	GenBank	Not Found	Not Found
87454092	2022-01-01 13:30:00	rs699_gene	Ensembl	Not Found	Not Found
64886101	2022-01-01 13:45:00	Papio_hamadryas_ORFs	GenBank	Not Found	Not Found
41232882	2022-01-01 14:00:00	BCL2	NCBI	Found	BCL2_sequ
27935464	2022-01-01 14:15:00	CDK4	Ensembl	Found	CDK4_sequ
93574136	2022-01-01 14:16:00	granulocytes_assembly	NCBI	Not Found	Not Found
98776794	2022-01-01 14:30:00	TP53	GenBank	Found	TP53_seau

*Diving into the data revealed the mismatch of customer expectations for the search and the complicated requirements to match intention to results. I compiled a subset of errors and created a prototype for matching the data as a kind of pre-search that would happen behind the scenes using regular expressions and some simple logic. The resulting map was used to create a working internal prototype to demo with the skeptics.*

- Collaborative Problem-Solving: Worked with the lead programmer to identify and sort search queries, eliminating the need for users to specify the source database IDs and other constraints.
- Addressing Stakeholder Skepticism: Faced skepticism from a stakeholder group and addressed concerns regarding user understanding of the new search process.
- Data-Driven Research Brief: Created a research brief, linking data to purchases and incomplete transactions, demonstrating user struggles with unfamiliar form elements.
- Mapping User Intent: Hand-matched user intent to proper search parameters, creating a comprehensive mapping for the new search tool.
- Prototype Testing: Tested a working prototype with a subset of customers who called in orders rather than using the confusing search, gathering valuable feedback for further improvements.

**ThermoFisher**  
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🔍 Enter your search term(s) here

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*While the resulting design seemed simple on the surface, the research to get there took a deep journey into customer data, feedback from customer support and tying it all together for staff scientists product managers and and business stakeholders.*

## Conclusion:

### Outcomes & Results:

The final gene-search tool roll out resulted in:

- Simplified Search Process: Elimination of the need for users to specify database sources.
- Improved User Experience: Resolved user confusion, leading to more accurate search returns.
- Increased Sales: Higher customer satisfaction translating to increased sales.
- The company was sold to Thermo Fisher in 2012 and the Gene Search was incorporated into their primary website as the de facto method for finding molecular genomic products

### Lessons Learned:

The project underscored the importance of data-driven decision-making, collaboration, and iterative prototyping in achieving successful outcomes.