

## Introduction

- LIMS: The central Allen Institute database for storing images and associated metadata
  - Can make queries to display data with no organizational structure
  - Difficult to see the dissection process
  - Cannot easily see missing or incomplete data
- My Project Goals:
  - Create a tool that connects to LIMS and displays a sorted hierarchy of data that better illustrates the process of data collection and brain dissection

## Figure 3: LIMS - Donor Q21.26.002

Donors									
Id	1082241414	[n/a]	H301	H301_210203_IHC_IP1	IHC, IHC:IBA1	Q21.26.002			
Donor Name	Q21.26.002								
External donor name (LabTracks ID)	Q21.26.002								
Organism	Macaca nemestrina								
Sex	F								
Age at death	11 yrs								
Race/Strain	Q21.26.002								
Weight (g)	7000.000								
Height/Length (cm)	[n/a]								
Phenotype	[n/a]								
Transgenic induction method	[n/a]								
Drawing tool	No blockface images								
Process dissections	[n/a]								

ImageSeries									
Id	1082241414	[n/a]	H301	H301_210203_IHC_IP1	IHC, IHC:IBA1	Q21.26.002			
Barcode	0400279667	0006	[n/a]						
Position in Specimen	[n/a]								
Structure Image	[Image]								
Nearest nissl	[Image]								

Specimens									
Name	Q21.26.002	1078029507	Q21.26.002	[n/a]	[n/a]	[n/a]			
Barcode	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			
Project	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			
Donor	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			
External Name	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			
Location	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			
Structure	1078029553	Q21.26.002	1078029553	Q21.26.002	[n/a]	[n/a]			

## Figure 5: Standout Features

Welcome to the Data Bridge!

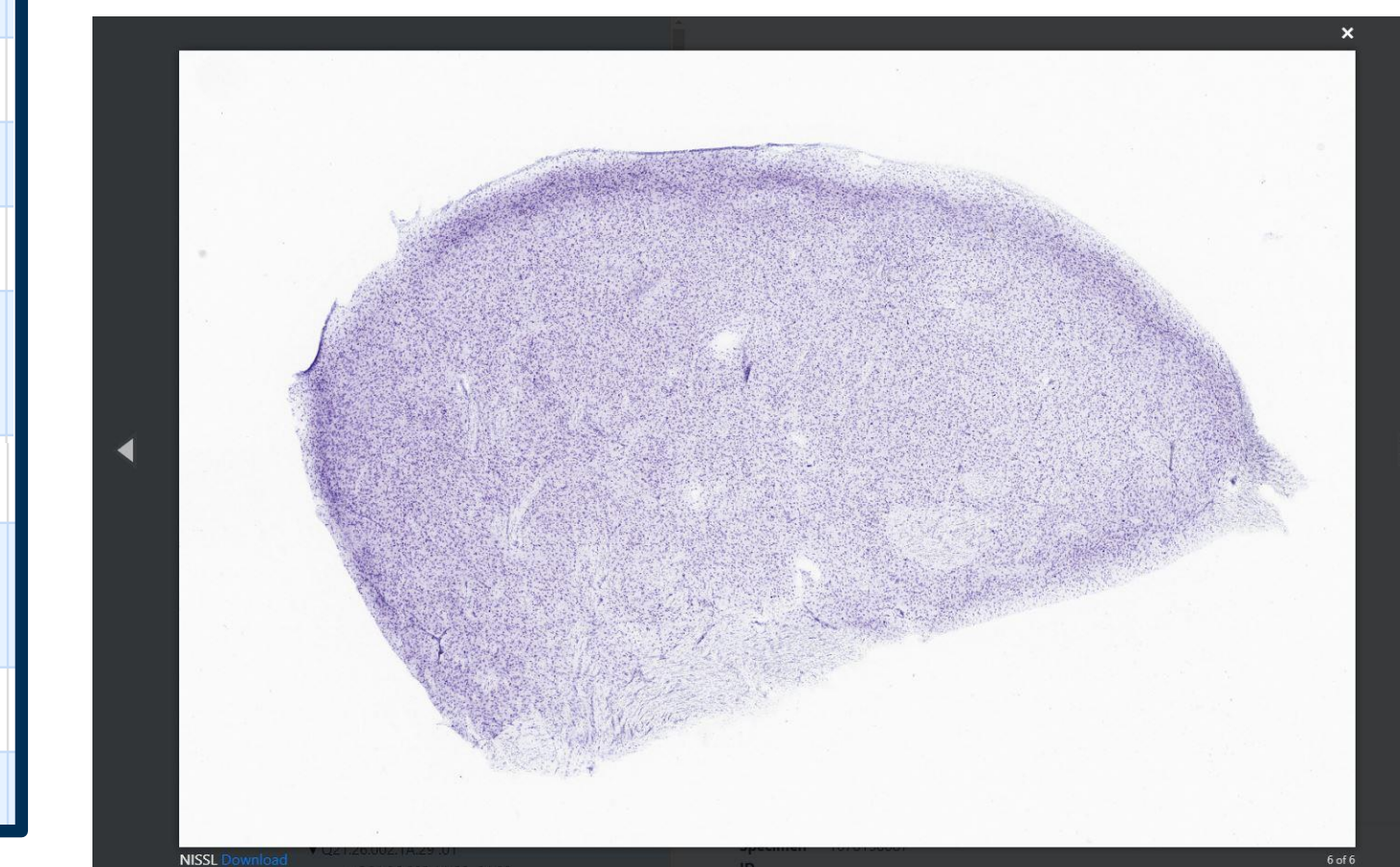
This is where you can search for all of the specimens that come from a specific donor

What is the name of the donor you would like to see?

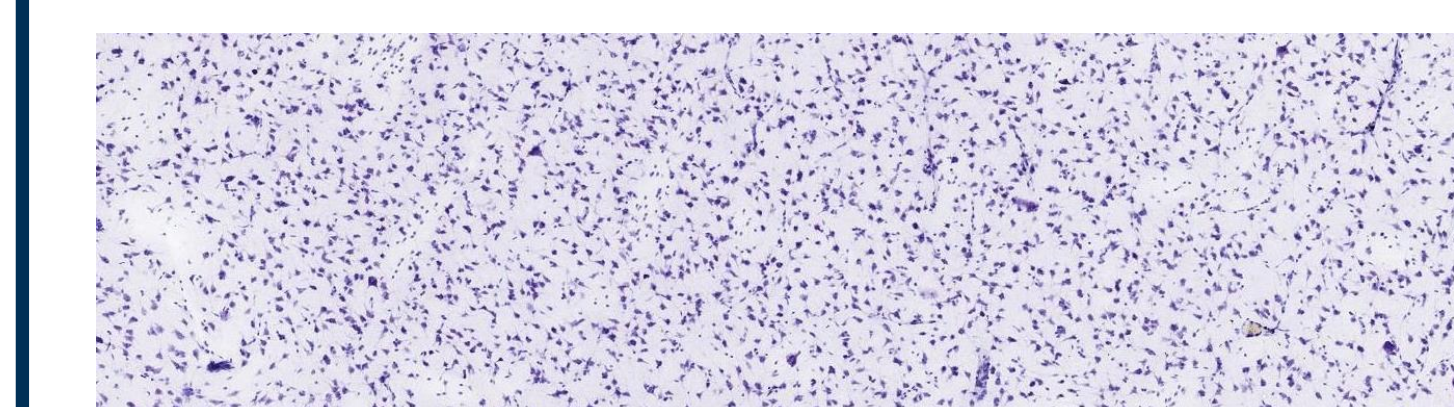
Q21

Submit

**Partial Search:** If a user doesn't know a donor's full name or wants to see all relevant donors of a certain species, the partial search feature will display all donors that match the given search. The provided table is sorted alphabetically for straightforward user navigation.



**Lightbox Image Carousel:** By clicking an image, a lightbox image carousel will appear, displaying an image in full-view with the ability to scroll through all images associated with a specimen. Users can also download images and view their associated tags (i.e. stain types for stain images).



**Zoomable Images:** Images retain high resolution and zoomability, allowing users to analyze cells and other relevant data.

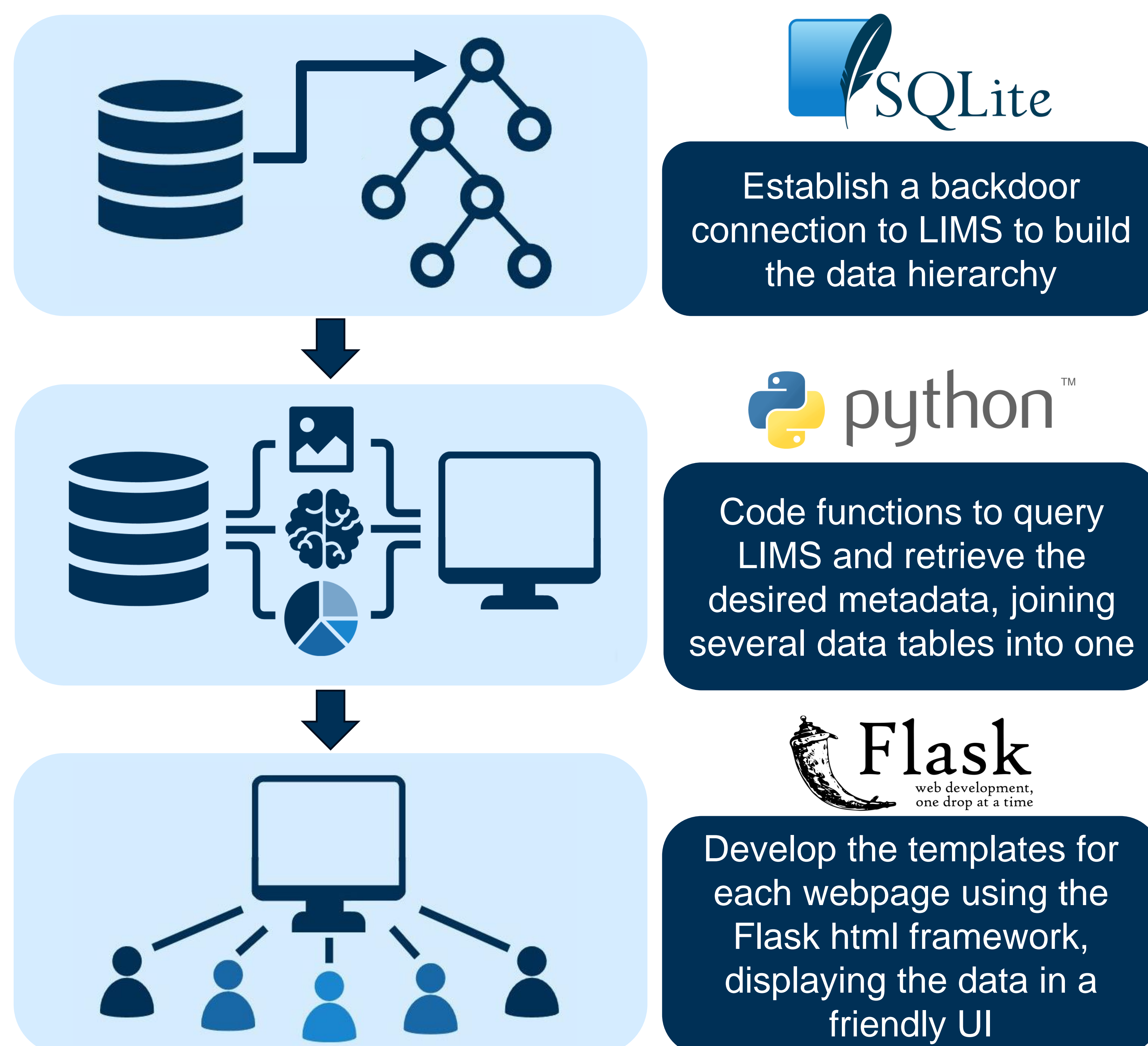
## Project Takeaways

- Decreases data search time by 75.7953%
- Joins data from at least three separate LIMS data tables into a single webpage
- Key Features
  - Partial Search:** ability to search part of a donor name and get all possible matches in alphabetical order
  - Expand/Collapse All button:** opens and closes the entire specimen dropdown
  - Image Lightbox:** opens the image carousel in full view
  - Download Button:** can download images directly to the local machine with the original file name
  - Zoomable Images:** images retain their .aff (Allen File Format) properties and can be zoomed in to inspect cells of stained images
  - Metadata table:** the most pertinent specimen information is pulled from LIMS and displayed for each specimen (i.e. parent id, plane of section, storage directory, etc.)
- Future Applications/Development:
  - Encode additional features such as metadata export, specimen name search, and more
  - Connect to the Specimen Portal to populate and upload data directly (aka *bridging* the gap between LIMS and the Specimen Portal)

## Acknowledgements

The development and deployment of my app would not have been possible without the guidance and mentorship of Scott Daniel who went out of his way to explain technical concepts, schedule weekly meetings, and provide the tools I needed to gain the technical skills for my project. I would also like to thank my mentors, Rebecca Hodge, Stephanie Seeman, and Lydia Ng for running my project and providing the data and information needed to test and develop my app's purpose and functionality.

## Figure 1: Software Development Process



## Figure 4: Data Bridge - Donor Q21.26.002

Donor Specimens	
Specimens with images are in <b>bold</b>	
<b>Collapse All</b>	
▼ Q21.26.002	
▼ Q21.26.002.11	
• Q21.26.002.11.01	
▼ Q21.26.002.11.02	
• Q21.26.002.11.02.01	
• Q21.26.002.11.02.02	
• Q21.26.002.11.02.03	
• Q21.26.002.11.02.04	
• Q21.26.002.11.02.05	
▼ Q21.26.002.12	
• Q21.26.002.12.01	
▼ Q21.26.002.13	
• Q21.26.002.13.01	
▼ Q21.26.002.1A	
▼ Q21.26.002.1A.25	
• Q21.26.002.1A.25.01	
• Q21.26.002.1A.25.02	
• Q21.26.002.1A.25.03	
▼ Q21.26.002.1A.28	
▼ Q21.26.002.1A.28.01	
• Q21.26.002.1A.28.01.02	
• Q21.26.002.1A.28.01.03	
• Q21.26.002.1A.28.01.06	
• Q21.26.002.1A.28.01.08	
▼ Q21.26.002.1A.28.02	
• Q21.26.002.1A.28.02.01	
• Q21.26.002.1A.28.02.02	
• Q21.26.002.1A.28.02.03	
▼ Q21.26.002.1A.29	
▼ Q21.26.002.1A.29.01	
• Q21.26.002.1A.29.01.02	
▼ Q21.26.002.1A.29.02	
• Q21.26.002.1A.29.02.02	
▼ Q21.26.002.1A.29.03	
• Q21.26.002.1A.29.03.02	
▼ Q21.26.002.1A.30	
▼ Q21.26.002.1A.30.01	

An expandable data hierarchy, illustrating the relation between donor specimens and showing where data is disconnected in LIMS

All metadata for each specimen is displayed, including all image types (blockface, stain, etc.) and both donor and specimen information

## Figure 2: Code Structure

app.py	1
templates	
base.html	
dropdown_and_metadata.html	
home.html	
static	
Images	
ErrorImage.JPG	
javascript	
JS dropdown.js	
JS home.js	
css	
# dropdown_and_metadata.css	
# dropdown.css	
# home.css	