

# Hub Updates and Q&A

*Carl Kesselman*

The FaceBase Hub has spent the last year:

- Publishing new data
- Improving existing data
- Launching and improving the new FaceBase website based on user feedback
- Identifying new ways to make our data as useful as possible

# DATA UPDATES

# Data Uploads



In Year 2, published data from most FaceBase 2 spoke projects:

- Regularly communicated with the spokes on their data submissions
- Feedback for the data submission spreadsheet produced by the informatics team
- Made updates to the vocabularies across all attributes
- Worked closely with the OCDM (Jim Brinkley) spoke to facilitate the ongoing development of ontologies

Our process for publishing new data:

- First posted the data for internal review by each spoke
- Allow to submit corrections where they had missing or incorrect fields.
- Effectively addressed quality control issues

# Data Uploads by FB2 Spokes



<b>Developing 3D Craniofacial Morphometry Data and Tools to Transform Dysmorphology</b>	1 dataset - Human - Morphometric analysis
<b>Genomic and Transgenic Resources for Craniofacial Enhancer Studies</b>	2 datasets - Mouse and Human - Chromatin modifier-associated region identification assay and RNA expression (RNA-seq) data
<b>Integrated Research of Functional Genomics and Craniofacial Morphogenesis</b>	2 datasets - Mouse - Hard and soft tissue microCT images and RNA expression (microarray)
<b>RNA Dynamics in the Developing Mouse Face</b>	1 dataset - Mouse - RNA expression (microarray) data
<b>Transcriptome Atlases of the Craniofacial Sutures</b>	2 datasets - Mouse - RNA expression (RNA-seq)

# Data Pending by FB2 Spokes



<b>Anatomical Atlas and Transgenic Toolkit for Late Skull Formation in Zebrafish</b>	Zebrafish Imaging data (In Review)
<b>Genomic and Transgenic Resources for Craniofacial Enhancer Studies</b>	Mouse or human transgenic bioinformatics
<b>Epigenetic landscapes and regulatory divergence of human craniofacial traits</b>	Mouse transgenic imaging and bioinformatics
<b>Transcriptome Atlases of the Craniofacial Sutures</b>	Mouse bioinformatics



# METADATA UPDATES

# Fixing and Curating



- Improved classification of data
  - New Experiment Type attribute
  - Added phenotypes
  - Support for transgenic enhancer data
- Clean up of existing metadata
  - E.g., consistent anatomical terms from OCDM
  - Genotype, fixing entries, etc



# Fixing and Curating



- Added cross linkages to navigate between related data
  - Between Gene Summary pages and dataset records
  - Looking for more opportunities between different data
- Handling human data
  - Working with the Spritz/Klein spoke
  - Refined the submission standards for human subjects data to support the latest research
  - Creating an automated ingest pipeline for sensitive data

# SITE ENHANCEMENTS

# Mouse Matrix



The new Mouse Matrix provides a rich visualization of all mouse control data.

- Grid of data by age stage and anatomy
- Color coding indicates the experiment type(s) available
- Clicking on the cells, rows, and columns allows users to navigate directly to the database entries for those data sets
- Users can scroll up and down the entries for each cell



# Mouse Matrix



- Show live on

<https://www.facebase.org/mousematrix/>

# Permalinks: One-click Data Shortcuts



- The Data Browser allows you to save your searches that are most interesting to you.
- Through analysis with domain users in the community, we identified key types of data of interest to FaceBase users.
- Via permalinks, we are able to add shortcuts to this data on the homepage and other parts of the site to take users directly to interesting collections.

# Permalinks: Example on Home page



FaceBase

Data ▾

Methods ▾

About ▾

Projects ▾

Help ▾

Log in Sign up

**Browse the Data Repository by Attributes** Get started with one of these or [start from scratch](#).

Try the new [Mouse Matrix](#) to visualize our mouse data.

## By Organism

Mouse

Zebrafish

Human

## By Genomics Data

Human Genotype and Phenotype Assay

Expression Profiling

Enhancer Identification

Gene Expression Pattern

## By Imaging Modality

microCT

microMRI

OPT Images

# Home page redesign



Last winter, we re-configured the home page to:

- Add permalinks
- Better reflect the data available
- Find other resources



# Home page redesign



- We are continuing to evolve and develop the homepage
  - Reflect new data capabilities and features (ie, Mouse Matrix)
  - Make it easier to share the data with the community.
  - Perform usability testing with people from the craniofacial community to better understand what they're looking for.

# Home page – new iteration



[FaceBase](#) [Data](#) [Methods](#) [About](#) [Projects](#) [Help](#)

[Sign up](#) [Logout](#)

## Comprehensive data and resources for craniofacial researchers

Search through craniofacial datasets of mouse, human and zebrafish with the [FaceBase Data Browser](#).

DATA BROWSER

VIDEO TUTORIAL

[Sign up to download datasets.](#)

### Mouse

#### Data Browser Shortcuts:

- [All Mouse Datasets](#)
- [Expression Profiling](#)
- [Enhancer Identification](#)
- [Mouse microCT](#)



#### Mouse Matrix

Browse a matrix of all available FaceBase mouse experiment types by anatomy and age stage.



#### Gene Expression Patterns

View gene expression pattern drawings and related gene information.



#### Mouse Anatomy

View color-coded images of mouse anatomical features by age stage.

### Human

#### Data Browser Shortcuts:

- [All Human Datasets](#)
- [Expression Profiling](#)
- [Enhancer Identification](#)
- [Human Genotype & Phenotype Assay](#)



#### Gene Expression Patterns

Certain genes in the Gene Expression Pattern Summary show where human mutations are expressed in the gene.



#### 3D Facial Norms Database

High-quality craniofacial anthropometric normative data.



#### Human Genomics Analysis

High-quality craniofacial anthropometric normative data.

### Zebrafish

#### Data Browser Shortcuts:

- [All Zebrafish Datasets](#)
- [Expression Profiling](#)



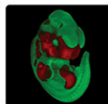
#### FishFace

Developmental atlas of zebrafish.

### More Resources

- [OCDM](#) - Ontology for craniofacial anatomy and development.
- [Genome Browser](#) - View our custom track on the UCSC Genome Browser.
- [Gene Expression Omnibus](#) - View a curated set of FaceBase mouse gene expression data.

### Featured Publications [View all FaceBase publications here.](#)



#### Fine tuning of craniofacial morphology by distant-acting enhancers.

Attanasio C, Nord AS, Zhu Y, Blow MJ, Li Z, Liberton DK, Morrison H, Plajzer-Frick I, Holt A, Hosseini R, Phouanavong S, Akiyama JA, Shoukry M, Afzal V, Rubin EM, FitzPatrick DR, Ren B, Hallgrímsson B, Pennacchio LA, Visel A. *Science*. 2013 Oct 25;342(6157):1241006. doi: 10.1126/science.1241006.

[Related FaceBase datasets](#)



### News [All news](#) | [Sign up for our mailing list](#)

03/02/2016 - 2016 FaceBase Annual Meeting in Denver May 2-3

02/09/2016 - Upgrade to FaceBase authentication - Phase 1 on Feb 13th

12/14/2015 - Site updates - First new FB2 datasets now available

10/13/2015 - Site updates - Homepage Links and Data Browser UI

# User and Group Management



With the launch of the new FB site, we integrated a flexible and secure user and group management services, Globus Nexus

- Same identity and groups across services using best practices for security.
- Extended and branded with FaceBase 2 styling,
- New workflows support an administrator approval process and required user attributes (e.g., the user's project and organization)
- Uses the Open Authorization (OAuth) protocol to enable secure authentication across services and the Globus Groups API to ensure that users are authorized to access FaceBase services and data.

# Upgrading Account Management



We are in the process of upgrading our system to use the Internet standard Open Authorization (OAuth) 2 protocol, used almost ubiquitously across the Web

- Soon, people will be able to log into the FaceBase site using their existing institutional logins or major commercial services such as Google.
- Reduces the barrier to access to a FaceBase account.

# Support for fine-grained authorization



Adding support for fine-grained authorization of data in the database server that powers the FaceBase data browser.

- best possible security and performance available in a web services stack
- Significant step towards providing our spoke projects with the ability to curate their own data in the coming year.

# Usability Enhancements



Been gathering feedback from the user committee.

- Implemented usability testing for the website and prototypes of features for the data browser.
- We convened a usability testing team and tested mockups of alternative user interfaces.
- Used results to improve the data browser search capability to make the search more intuitive.
  - Example, “Filter” button
  - Easier to understand how to add filters to the search in order to quickly narrow results to the desired set of data.
  - New “Site Tour” link in Data Browser
- Surveys indicate higher user satisfaction

# METRICS AND ANALYTICS

# Web traffic statistics



Using Google analytics, here is the interaction with the new site since July 1, 2015

Number of:

- New registered users: 201
- Downloads of dataset zips: 319\*
- Unique page views: 34,973
  - Average pages per session: 3
  - Average session duration: 3:54
- New vs Returning visitors: 64.7% / 35.3%

Bounce rate: 45% (pretty average for websites)

Data Browser itself has been accessed over 4,000 times.

\* This metric doesn't include views of 2D images and 3D previews.



# Video Demo



New video showcasing how you can answer  
craniofacial research questions using  
[www.facebase.org](http://www.facebase.org)

Debuted at the Gordon conference

# Video Demo



Show demo:

<https://youtu.be/5NUQyV3FSfM>

# Coming up...



- High resolution data model
- Heatmaps
- More cross-cutting integrations and visualizations between datasets
- More data matrices – you'll be able to define the criteria
- Integrate the Monarch PhenoGrid functionality into FaceBase.
  - Browse across related phenotypes within the FaceBase datasets as well as to identify related data that might exist outside of FaceBase.