**Apollo** an efficient tool to collaboratively refine and attribute genome-wide genomic annotations

Nathan A. Dunn¹, Colin Diesh², Helena Rasche³, Anthony Bretaudèau⁴, Rob Buels², Nomi Harris¹, Ian Holmes²

(1) Lawrence Berkeley National Laboratory, Berkeley, CA, (2) Department of Bioengineering, UC Berkeley, (3) University of Freiburg (4) INRA, BIPAA/GenOuest, France

https://github.org/GMOD/Apollo/

- Assembly errors / limited coverage
- Visualization finds problems numbers can’t
- Include additional analysis as needed
- Integrate all underlying biological evidence

**Experimental Evidence**
- cdNAs, HMM domain searches, RNAseq
- genes from other species.
Edit Annotation Structure

Adjust exons by dragging

Revertible Visual History of Edits

Functional Annotation
- Gene Ontology
- Pubs
- Metadata
  - key/value
  - status
  - comments
  - supports predefined

Get Sequence
Get GFF3
Zoom to Base Level
Edit Information (alt-click)

Change annotation type
gene
pseudogene
rRNA
snRNA
snoRNA
tRNA
ncRNA
miRNA
repeat_region
transposable_element

Get Sequence
Add transcript
Set translation end
Set readthrough stop codon
Change annotation type
nathandunn@lbl.gov
8/14/16 12:53 PM

Revert
1

downstream Splice Donor
downstream Splice Acceptor
upstream Splice Donor
upstream Splice Acceptor
Real-time annotation (like Google Docs)

Multiple projects and users

Fine-grained user / group access

- Publish GFF3, FASTA (including assembly errors), VCF (variants), GPAD2/GPI2 (GO)
- Annotation editors attributed per annotation

Researcher #1

Researcher #2

Researcher #3
$arrow groups create_group university
$arrow users get_users | \
    jq '.[] | select(.username | \
    contains("@tamu.edu")) | .username' | \
    xargs -n1 arrow users add_to_group university

from apollo import ApolloInstance
wa = ApolloInstance('https://fqdn/apollo',
                     'jane.doe@fqdn.edu', 'password')
orgs = wa.organisms.add_organism(
    "Yeast",
    "/path/to/jbrowse/data")
Getting Apollo

- **GMOD/Apollo**
- AWS Community Marketplace
- Docker

Future

- JBrowse2: Synteny and Circos view
- Edit “published” tracks
- Full provenance
- Community need?

Contacting

- **apollo@lbl.gov**
- [https://github.org/GMOD/Apollo/](https://github.org/GMOD/Apollo/)
- [https://gitter.im/GMOD/jbrowse](https://gitter.im/GMOD/jbrowse)

```
docker run -it -v /jbrowse/directories:/data -v empty_db_directory:/var/lib/postgresql -p 8888:8080 quay.io/gmod/apollo:latest
```

Questions?