A Fathead Minnow Genome Browser Provides Simplified Access to Annotated Genomic Sequences

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FATHEAD MINNOW GENOME BROWSER

BACKGROUND

- The fathead minnow (*Pimephales promelas*) is a widely used model laboratory organism
  - Long history of use in research and regulatory toxicity testing
  - Biological responses to chemical exposures relatively well-documented

- However, until recently, genome scale information was lacking for this species
  - Limited the utility of the species for pathway-based toxicity testing and research
  - 'omics' technologies proven to be powerful tools

DEVELOPMENT

- Next generation sequencing was applied to generate a draft fathead minnow genome assembly (Burns et al., 2016).
- First generation genome annotation was developed using AUGUSTUS *Ab initio* gene prediction
- Developed into a user-friendly browser, accessible to the research community (Saari et al., 2017)

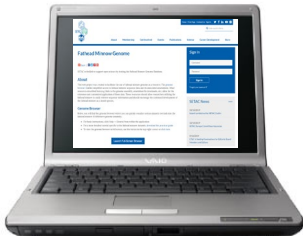# FATHEAD MINNOW GENOME BROWSER

PURPOSE OF THE TOOL

- Provides simplified access to the annotations for the fathead minnow genome
- Allows the user to:
  - Search for genes of interest
  - Extract corresponding sequence
  - Identify intron and exon boundaries
  - Align the predicted genes with supporting evidence

TOOL FORMAT/ACCESSIBILITY

- Web-based tool hosted by SETAC
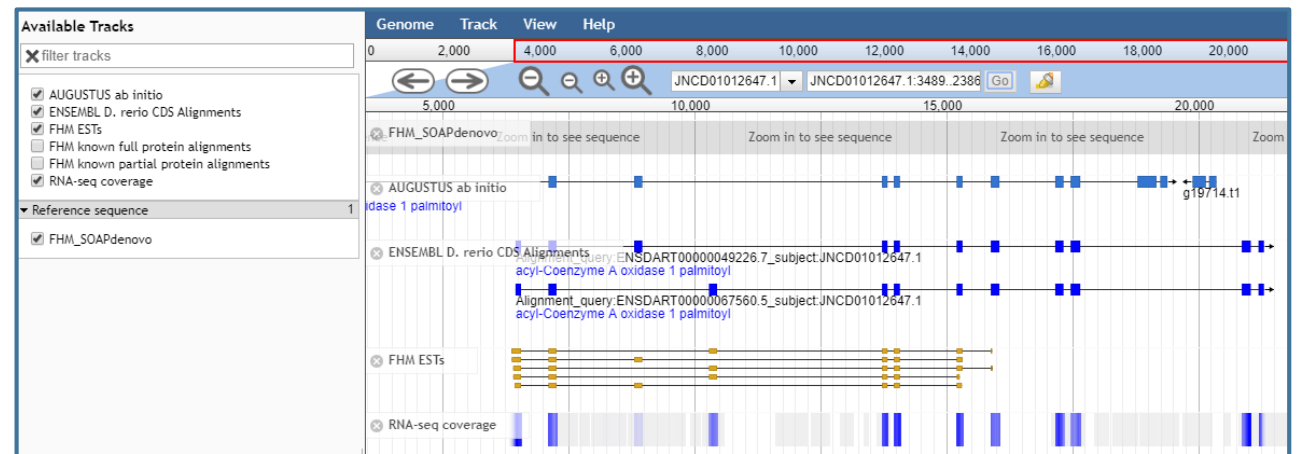- Accessed at:
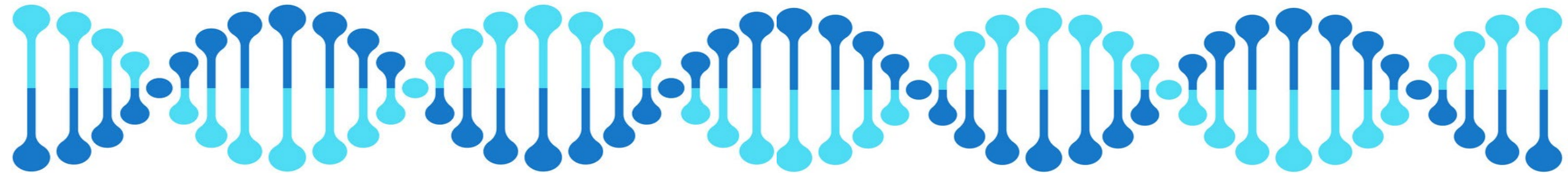
www.setac.org/fhm-genome

INTENDED AUDIENCE

USERS/PRACTICAL APPLICATIONS:

- The ecotoxicology community
- Any application for which an annotated fathead genome is required/desired
- Primer and probe design (QPCR, WISH, RNAseq, etc…)
- CRISPR guide strands
- 'omics' research
- Opens up a wide array of new research opportunities with the fathead minnow

REFERENCES

- Burns, F.R., Cogburn, A., Ankley, G.T., Villeneuve, D.L., Waits, E., Chang, Y.-J., Llaca, V., Deschamps, S.D., Jackson, R.E., Hoke, R.A. 2016. Sequencing and de novo draft assemblies of a fathead minnow (*Pimephales promelas*) reference genome. *Environmental Toxicology and Chemistry* 35: 212-217.

- Saari, T.W., Schroeder, A.L., Ankley, G.T., Villeneuve, D.L. 2017. First-generation annotations for the fathead minnow (*Pimephales promelas*) genome. *Environmental Toxicology and Chemistry* 36: 3436-3442.

ACKNOWLEDGMENTS

Thank you!

Du Pont de Nemours
Frank R Burns
Amarin L Cogburn
Stephane D Deschamps
Raymond E Jackson
Robert A Hoke

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