Genome Browser Grant Year 4 tasks

Aim 1. Develop, maintain, and extend software for web-based display and command-line-driven analysis of genomics resources.
- Release condensed "exon-only" display.
- Update index page (and other text pages) with better graphics.
- Complete work to display long-distance chromatin interactions including those across chromosomes.
- Allow users to combine graphs selected from diverse sources.
- Help users find data and tracks more easily.
- Track Hubs: set standards, build validation tools, build a wrapper to serve them through API, create better search mechanism.
- Allow users to post their sessions for others to see.
- Genome Browser in the Cloud (GBiC), a cloud-based version of GBiB.
- Ensure that new default tracks do not end up in existing sessions.
- Make it easier for users to publish public track hubs.

Aim 2. Build genome browsers and comparative genomics resources for species of biomedical interest.
- Add genome browsers for nine new species or updated genomes.
- Add new multiple-alignment track for one set of assemblies.
- Reevaluate various alignment tools if appropriate opportunity occurs.

Aim 3. Import data from the scientific community that help interpret the functions of various human genome regions into the UCSC databases.
- Add UMD.be variant database if opportunity presents.
- Continue adding annotations to GRCh39/hg38, make it the default human browser when sufficiently annotated.
- Work with ENCODE, Epigenomic Roadmap and Blueprint Epigenome to get data to add to the integrated Regulatory Track.
- Work with the GTEx group to get exon and base-by-base levels in an appropriately anonymized fashion.
- Add a protein domain track for use with the multiple-region display.
- Update proteomics tracks.

Aim 4. Build high quality gene sets on the human genome and selected model organism genomes.
- Update UCSC Genes for mouse.
- Update GENCODE Genes for human.
- Evaluate GENCODE as replacement for primary gene set on mouse.
- Work with GENCODE to get piRNAs into the gene set.

Training & Outreach
- Record and release 8-10 more short video clips detailing specific browser tasks and release to YouTube channel.
- Present approximately 30 workshop trainings and meeting appearances.
- Create a session gallery illustrating interesting biological situations that highlight features of the Genome Browser.
- Double disc capacity of Bielefeld, Germany, Genome Browser mirror to accommodate increases in our data footprint and to site a downloads server.
- Finish setup of Genome Browser mirror at RIKEN in Japan to support Asian users.