

new orleans
St. Patrick's Day Parade

It is finally here!
'til St. Patrick's Day. Erin go bragh!



parades/parties

Friday, March 11, 2016

Molly's at the Market Irish Parade - 6:00 p.m.

Saturday, March 12 & Thursday, March 17, 2016

Parasol's Block Party 10 a.m. - 8 p.m.

Saturday, March 12 & Thursday, March 17, 2016

Tracy's Block Party 11 a.m. - 'til

Saturday, March 12, 2016

Irish Channel Parade - 1 p.m.

Sunday, March 13, 2016

St. Patrick's Day Parade on Metairie Rd. - 12 Noon

Thursday, March 17, 2016

Downtown Irish Club Parade - 6:00 p.m.

Saturday, March 19, 2016

Italian-American St. Joseph's Parade - 6 p.m.

Sunday, March 20, 2016

Louisiana Irish-Italian Parade (Metairie) - 12 Noon

Saturday, April 16, 2016

St. Bernard Irish-Italian Islenos Parade - 12 Noon



Data in the post-genome era



Encyclo

The Canc



4D N

The pow

This is v

This is what actually happens



Big Bio Data Information Flood

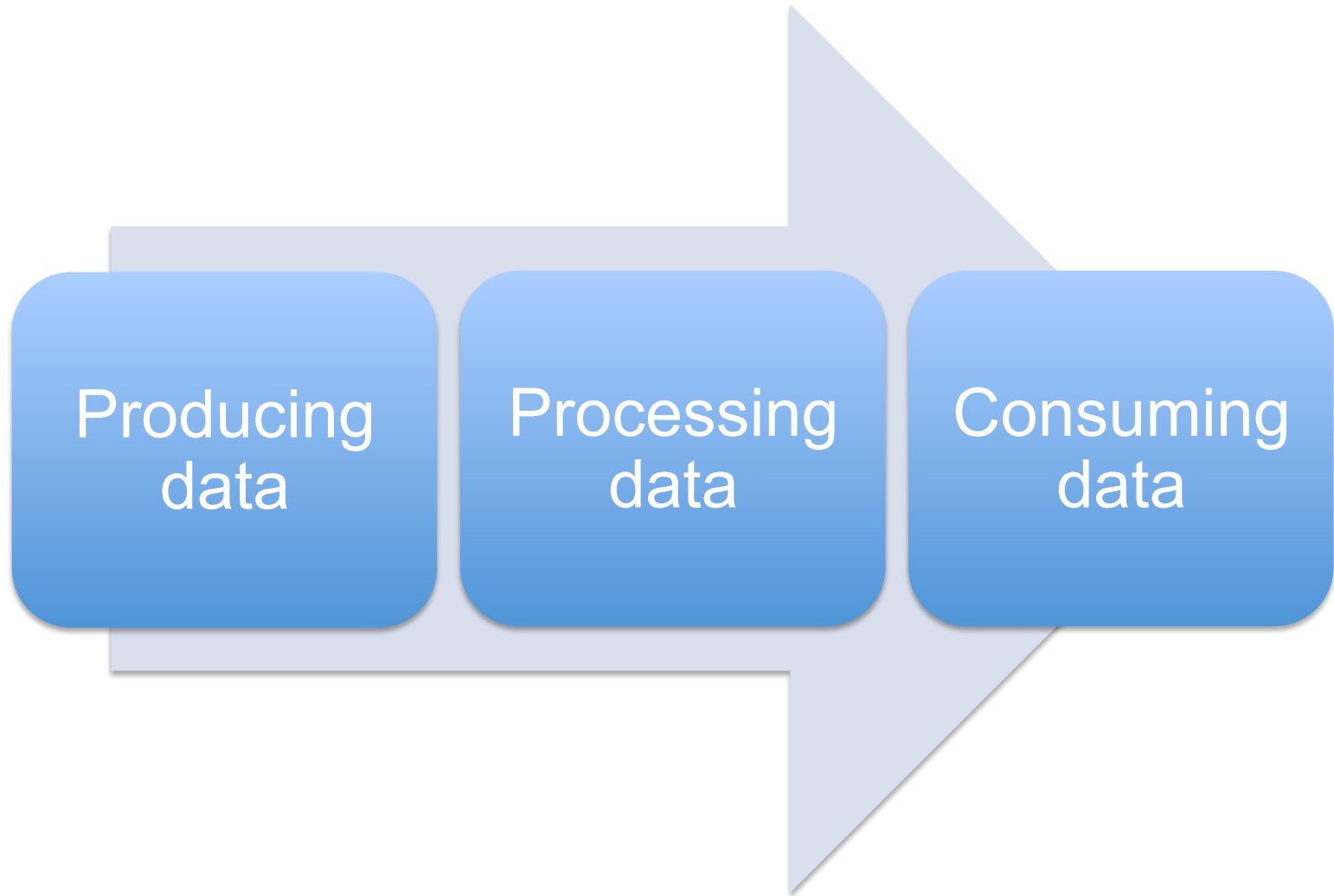


Complex!



Mysterious!

Big Bio Data Information Flood Flow



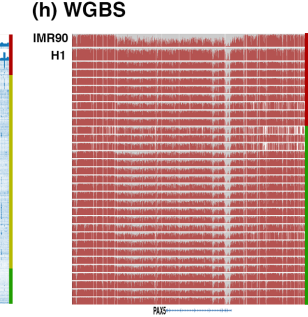
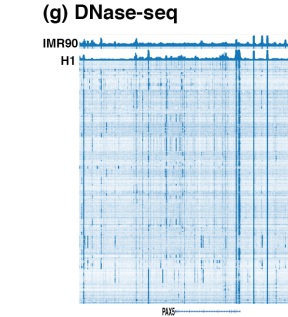
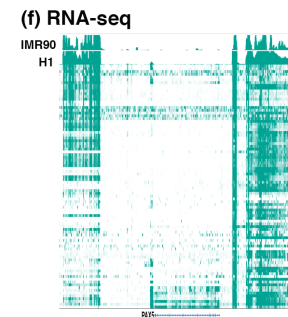
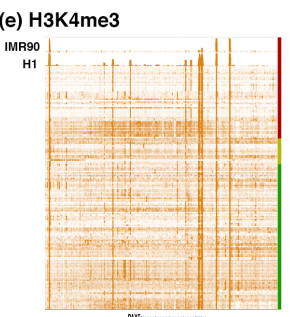
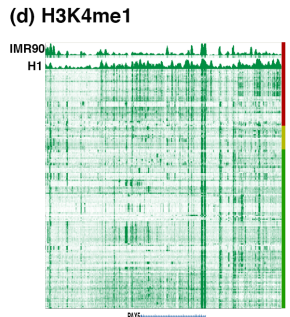
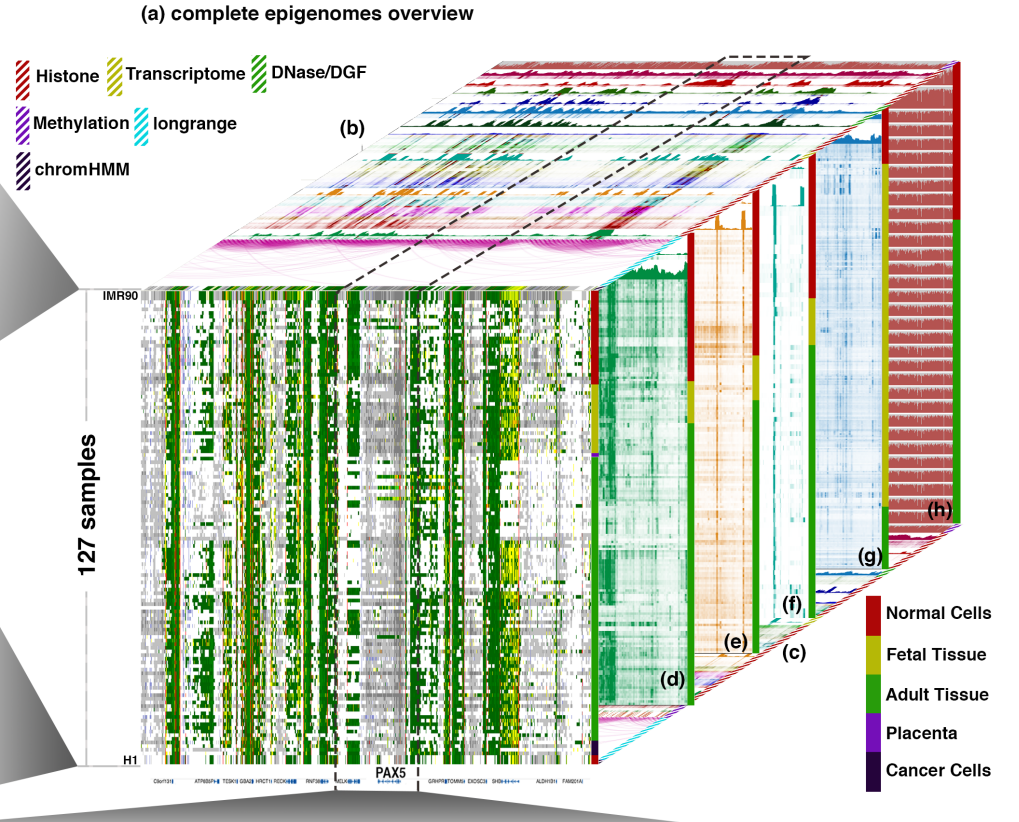
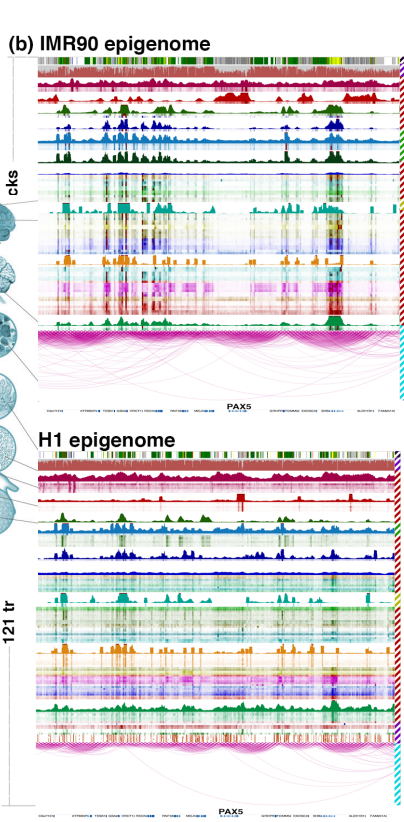
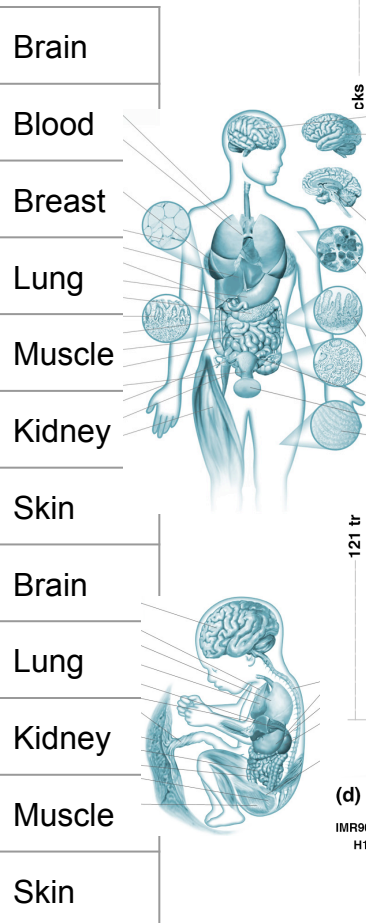


ROADMAP
epigenomics
PROJECT



NIEHS, NIDA, NHGRI, Common Fund

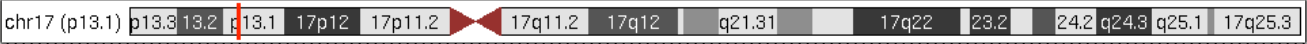
The Map!



UCSC Genome Browser on Human Feb. 2009 (GRCh37/hg19) Assembly

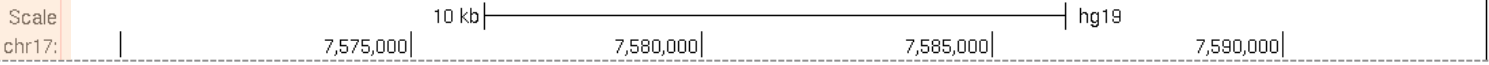
move <<< << < > >> >>> zoom in 1.5x 3x 10x base zoom out 1.5x 3x 10x

chr17:7,569,035-7,593,494 24,460 bp. TP53 go



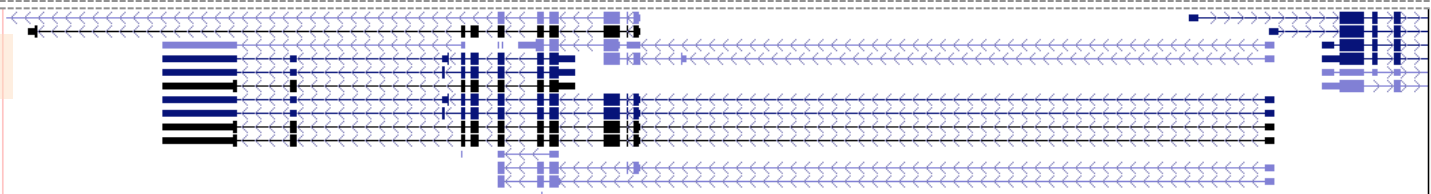
The UCSC Browser

The linear genome



The gene

CpG Islands

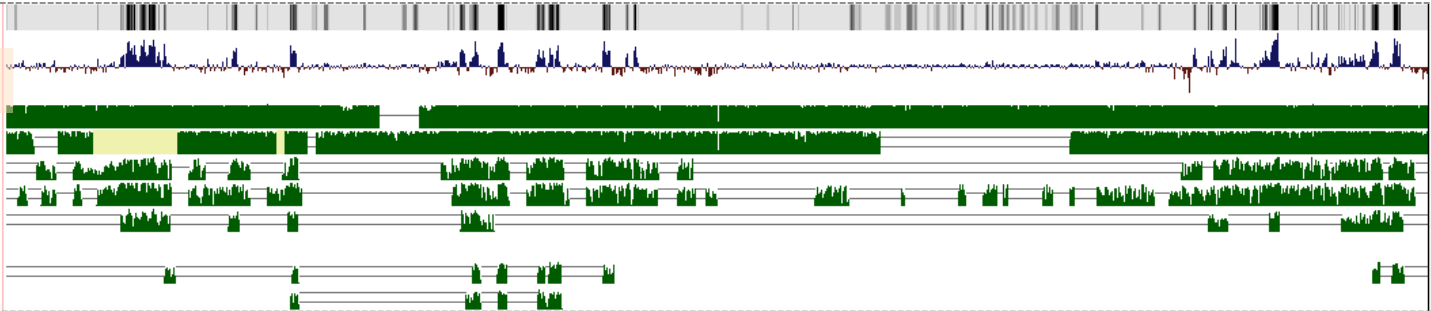


Conservation

Vertebrate Cons

Mammal Cons

- Chimp
- Rhesus
- Mouse
- Dog
- Opossum
- Chicken
- X_tropicalis
- Zebrafish

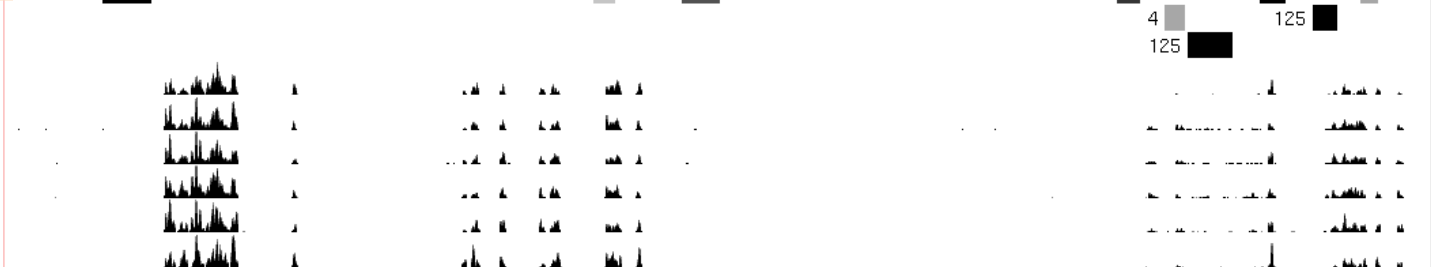


Function

Layered H3K27Ac



- A549 DEX100nM 1
- A549 DEX100pM 1
- A549 DEX1nM 1
- A549 DEX500pM 1
- A549 DEX5nM 1
- A549 ETOH 1

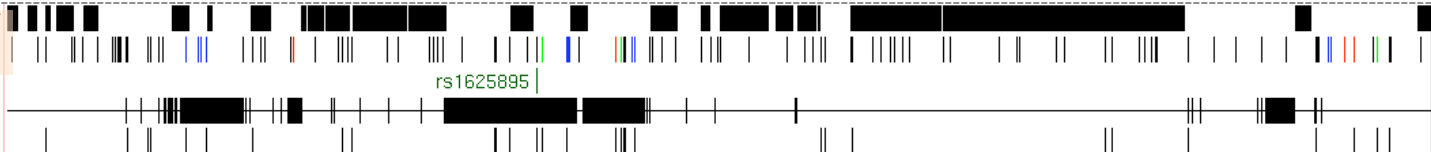


Variation

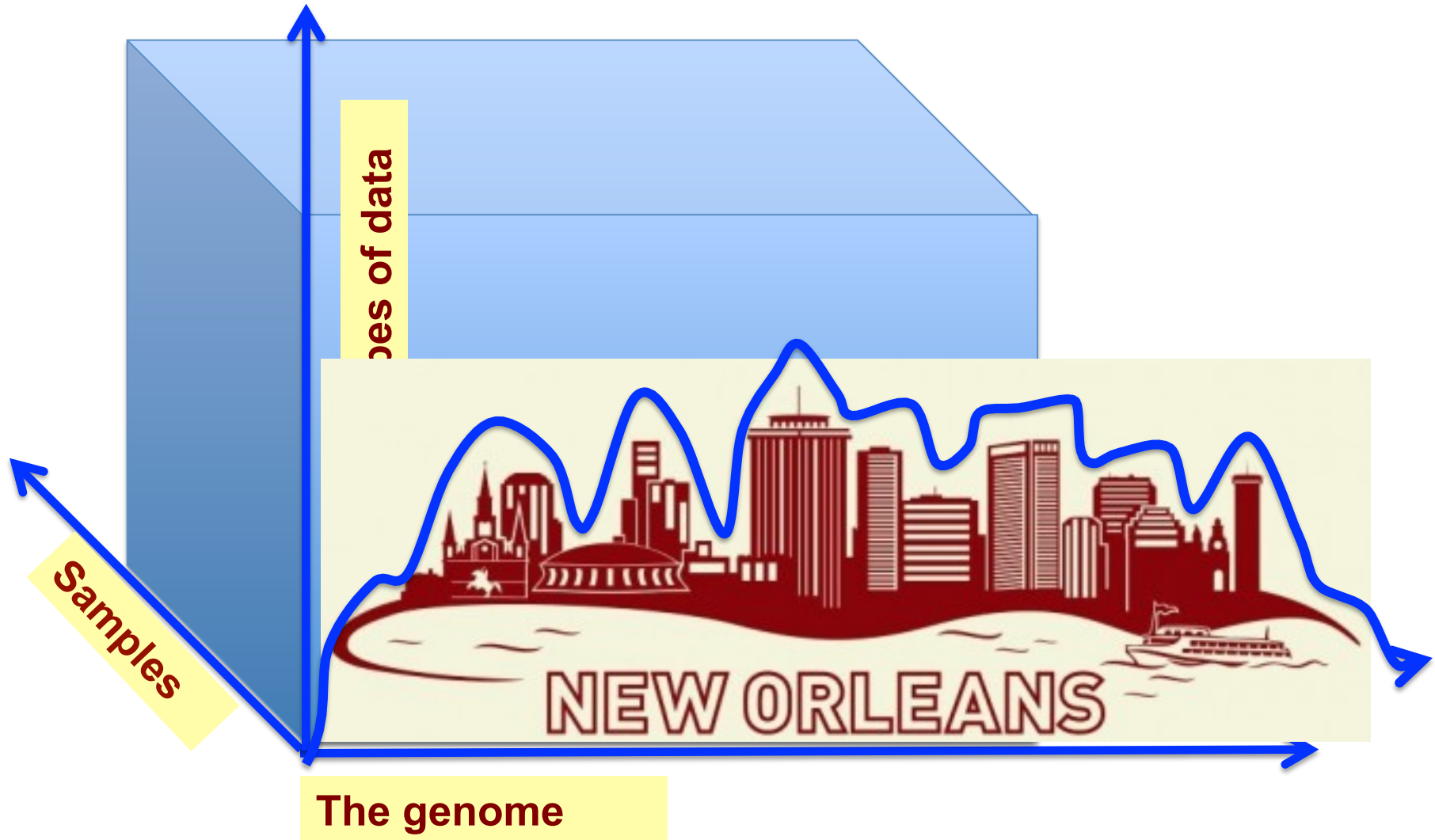
RepeatMasker

Common SNPs(137)

Sequences
SNPs



Navigating the genomic data landscape



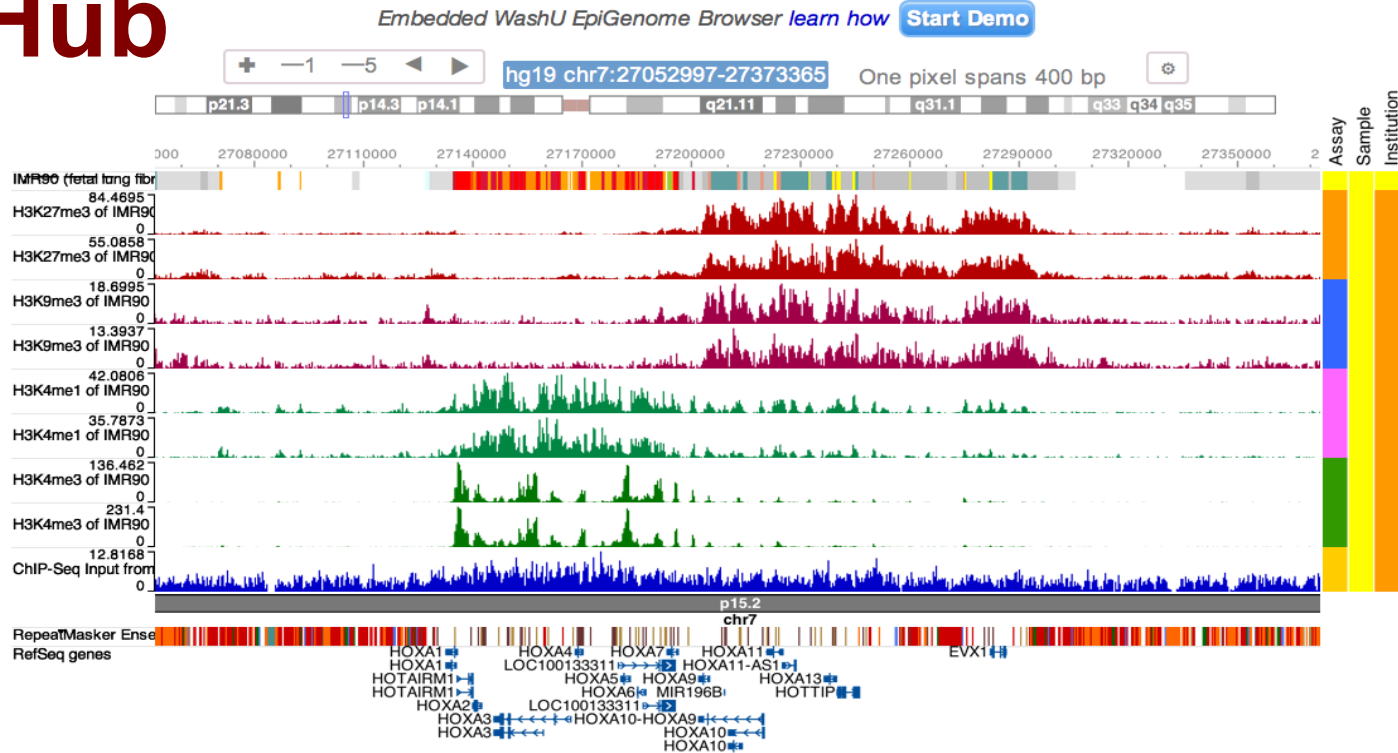
Mechanisms for accessing Roadmap data

- **Current datasets available through Wash U Hub**
 - Roadmap experimental data: **4737** tracks
 - Roadmap integrative analysis: **18181** tracks
 - ENCODE data: **4253** tracks
 - *IHEC data* (<http://epigenomesportal.ca/ihec/>): **5667** tracks
- **UCSC Genome Browser Mirror**
 - <http://epigenome.wustl.edu>
 - Fully functional UCSC Mirror for accessing complete set of Roadmap data
- **Remote Data Hub for UCSC Browser**
 - <http://genome.ucsc.edu/cgi-bin/hgTracks?db=hg19&hubUrl=http://vizhub.wustl.edu/VizHub/RoadmapReleaseAll.txt>
 - Data are physically located at remote site (St. Louis), and directly displayed at UCSC Genome Browser
- **Wash U Epigenome Browser**
 - <http://epigenomegateway.wustl.edu>
 - Next generation genome browser for exploring Roadmap, ENCODE, and other data
 - Community outreach and workshops
 - <http://epigenomegateway.wustl.edu/support/workshop.html>

Roadmap Epigenomics Visualization Hub (VizHub)

Roadmap Epigenomics Project | NCBI Epigenomics Gateway | Roadmap Data Coordination Center

VizHub



WASHU EPIGENOME BROWSER

A new-generation genome browser for integrative visualization of genomic information. Hosts high volume of tracks from ENCODE and Roadmap Epigenomics projects, supports multiple organisms, visualizes chromatin-interaction data (e.g. Hi-C), performs gene set view, gene plot, and many others. All delivered on the web at high performance.

[Go to the Browser](#)

VizHub

Displaying sequencing data from Roadmap Epigenomics project, powered by a local mirror of UCSC Genome Browser.

[Go to the Browser](#)

Remote Data Hub

Displaying sequencing data from Roadmap Epigenomics project, powered by UCSC Genome Browser through data hub function.

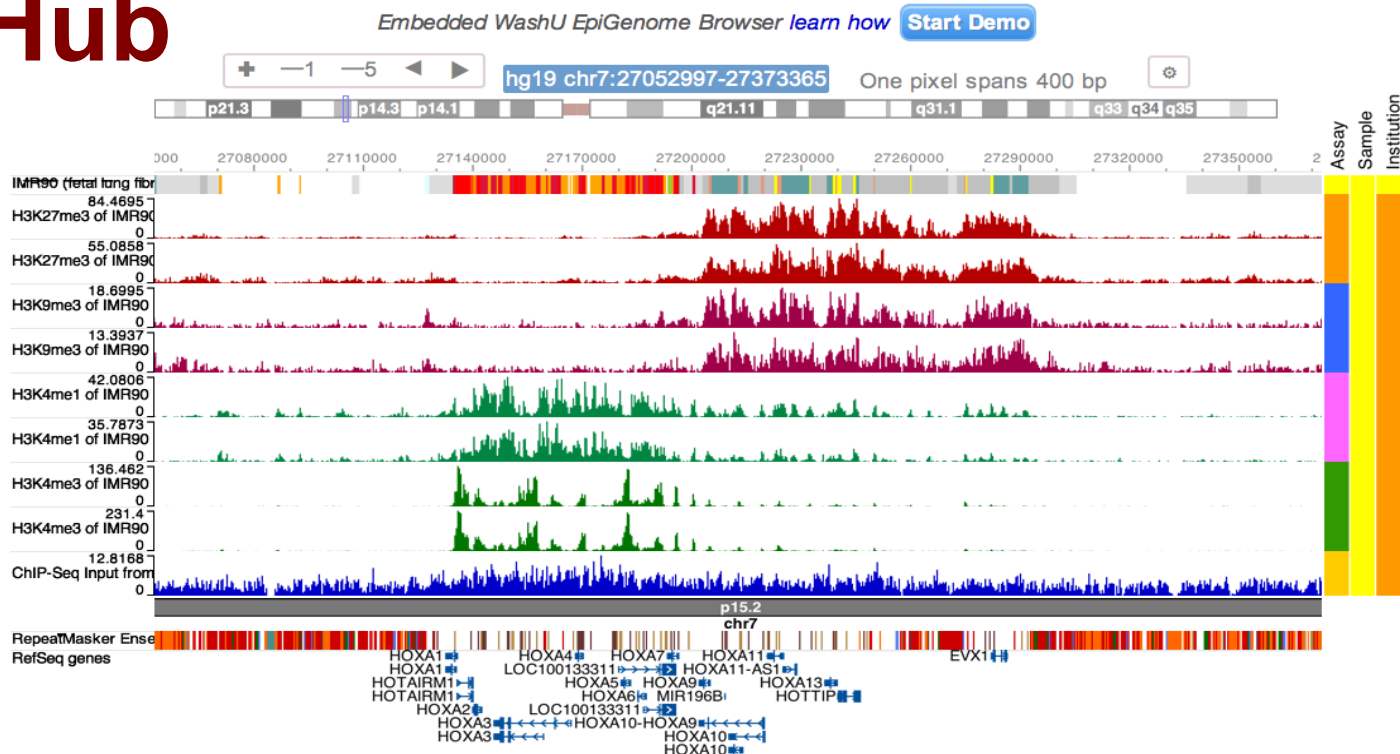
[Go to the Hub](#)



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[Go to the Browser](#)

VizHub

Displaying sequencing data from Roadmap Epigenomics project, powered by a local mirror of UCSC Genome Browser.

[Go to the Browser](#)

Remote Data Hub

Displaying sequencing data from Roadmap Epigenomics project, powered by UCSC Genome Browser through data federation.



[Go to the Hub](#)



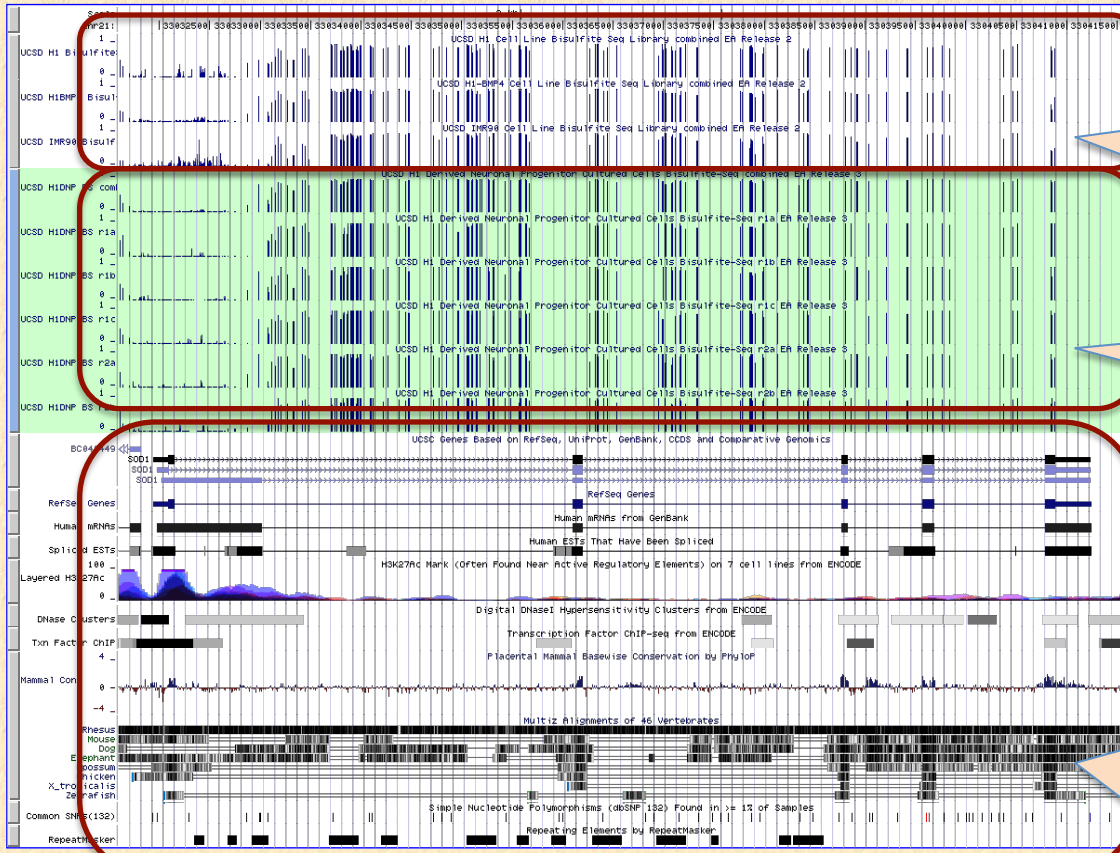
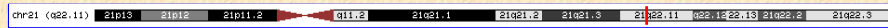
Washington University School of Medicine in St. Louis



Washington University

Department of Genetics

<http://ucsc.wustl.edu/>



Roadmap default tracks

Roadmap select tracks

Native UCSC tracks (ENCODE, etc)

move start Click on a feature for details. Click or drag in the base position track to zoom in. Click side bars for track options. Drag side bars or labels up or down to reorder tracks. move end

< 2.0 > track search default tracks default order hide all add custom tracks track hubs configure reverse refresh

Use drop-down controls below and press refresh to alter tracks displayed. Tracks with lots of items will automatically be displayed in more compact modes.

Roadmap Epigenomics Release II at Wash U VizHub refresh

Summary...	Methylation	DNA Methylation	Cell Type Summary...	BI Histone	Chromatin Accessibility
hide	hide	full	hide	hide	hide
UCSD Histone	UCSF Histone	RNA	H1 State Segmentation	IMR90 State Segmentation	
hide	hide	hide			

Roadmap track control

Roadmap Epigenomics Release III at Wash U VizHub refresh

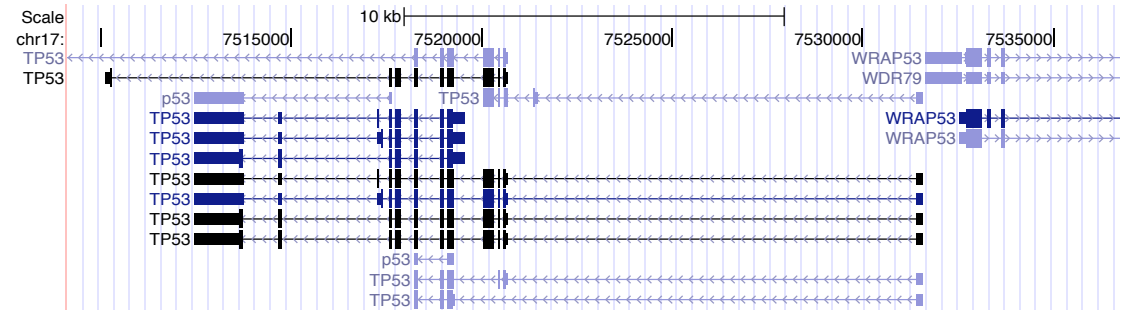
Methylation Summary...	Summary...	UCSD Histone	UCSF Histone	BI Histone	DNA Methylation
hide	show	hide	hide	hide	full
DNase	RNA				
hide	hide				

Roadmap track control

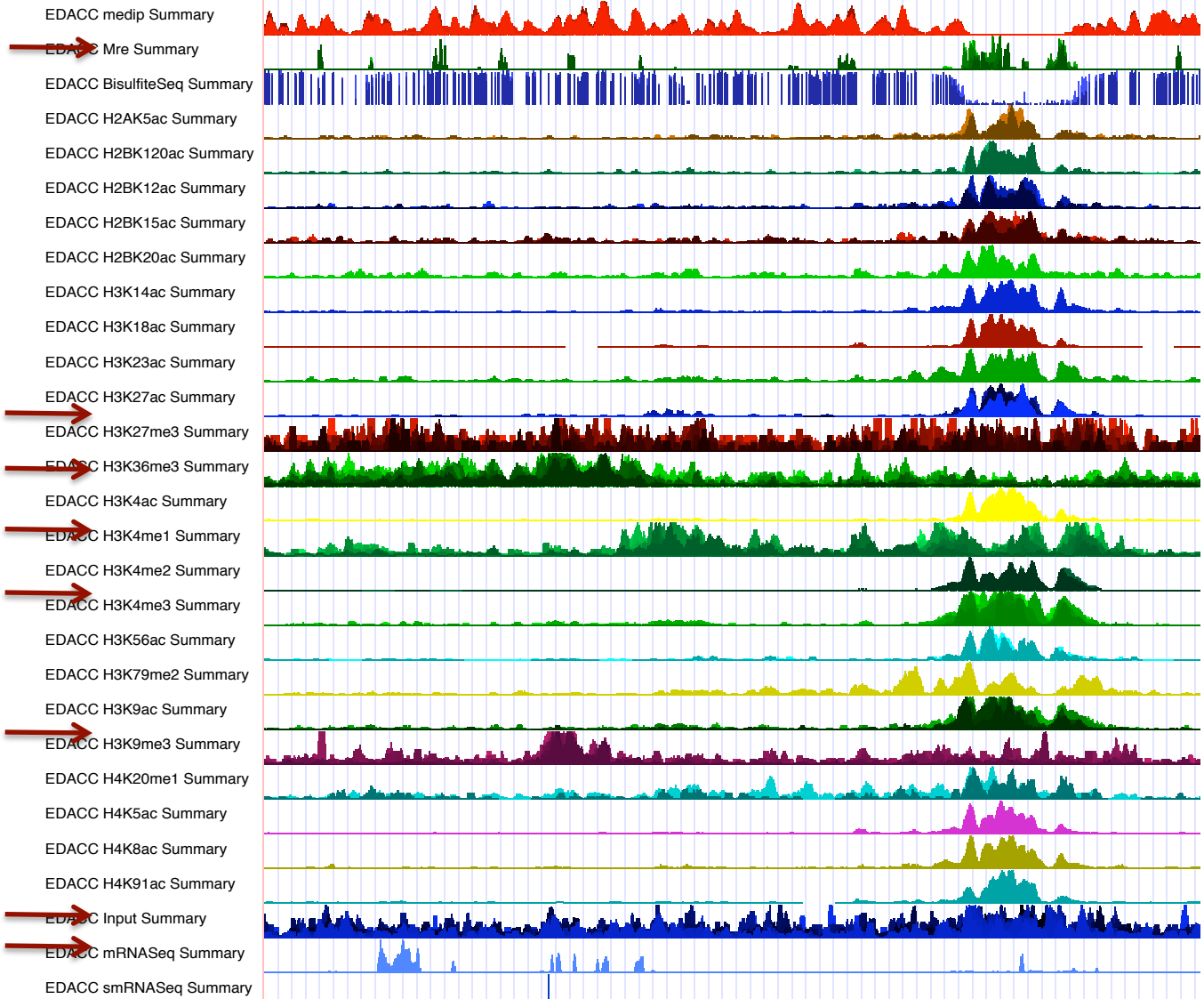
UCSC remote access



Summary View of Epigenome Atlas 1



Methylation



H3K27me3

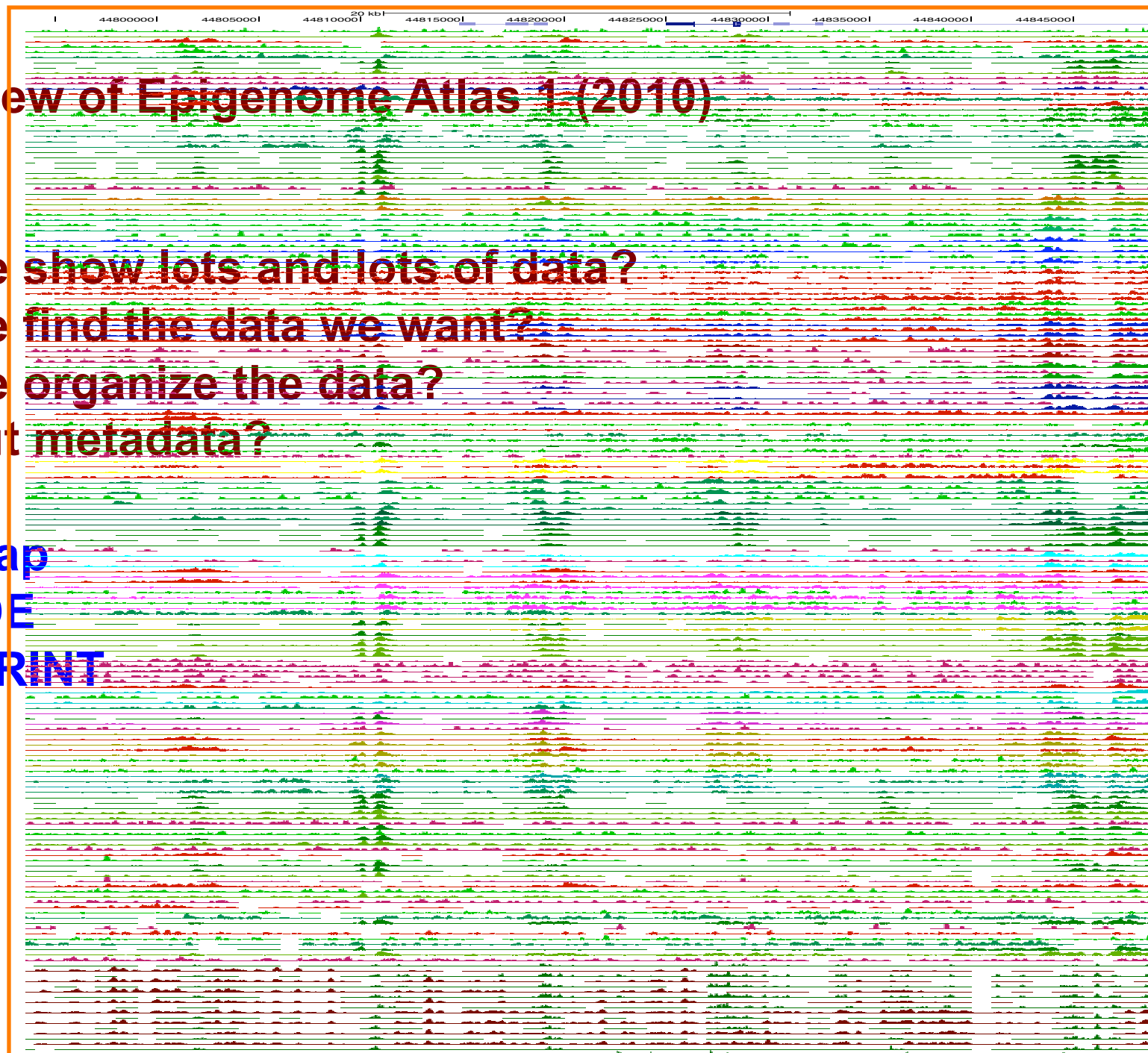
H3K36me3

H3K4me1

H3K4me3

H3K9me3

Input RNA



Another View of Epigenome Atlas 1 (2010)

- How do we show lots and lots of data?
- How do we find the data we want?
- How do we organize the data?
- What about metadata?

Roadmap
ENCODE
BLUEPRINT
IHEC

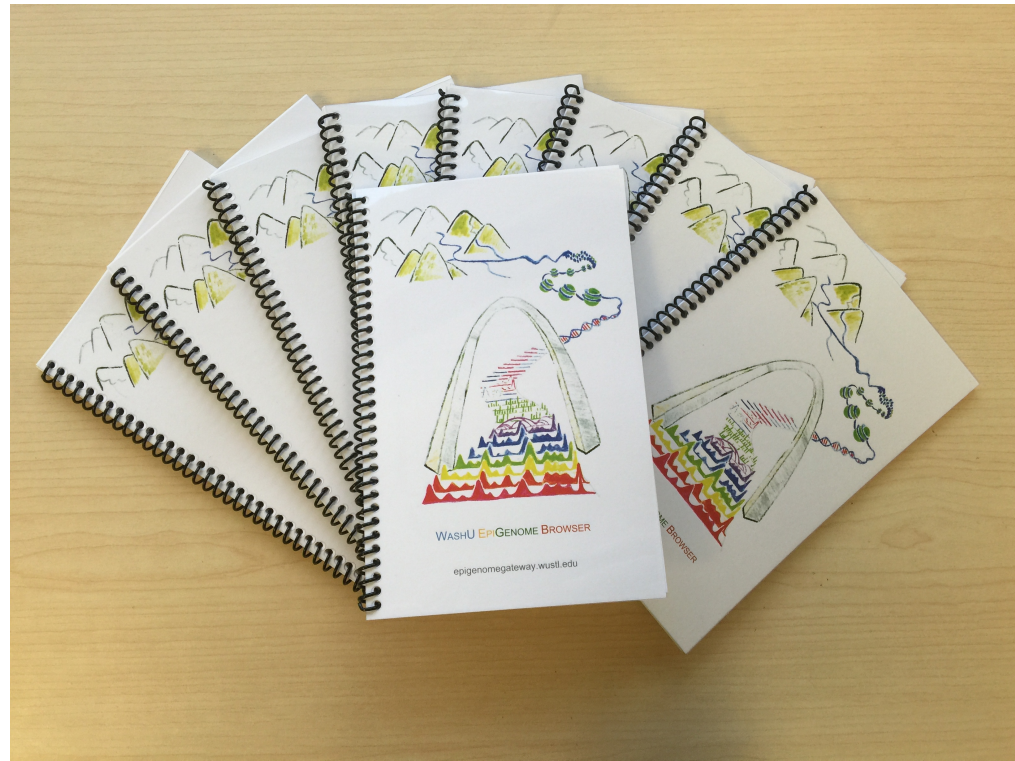
WashU Epigenome Browser:

Innovations in exploring epigenomic data

- **Community resource for multi-dimensional data**
 - Browse hundreds of data tracks in one view
 - Display epigenomic data alongside with their metadata
 - Viewing data on specific genomic features, genesets, or pathways
 - Outreach activities
 - **Google-map style browsing**
 - Heatmap, wiggle map, going from whole genome to single base
 - Zoom and pan, drag and drop, extensive user configuration
 - Sessions, custom track, custom hub, hub cluster
 - **Visualizing non-linear genome**
 - Display chromatin interaction data (HiC, ChIA-PET, etc)
 - **Visual bioinformatics engine**
 - Real time statistical analysis
 - Common genomic data summary graph
 - **Continued development**
 - Novel, more expressive visual format
 - Comparative epigenomics
 - Cancer genome browser
 - Browser of transposable elements
- Nat Methods 2011, 8:989-990
Curr Protoc Bioinformatics. 2012
Nat Methods 2013, 10:375–376
Bioinformatics, 2014, 30(15):2206-7
Nat Biotechnology, 2015, 33, 345–346

Outreach and education

- Support websites
 - Wiki, helpdesk, mailing list
 - Documentations, tutorial book, video demo
- User community and social media
 - Facebook
 - Google+
- Workshops
 - CSHL
 - ASHG 2014
 - Keystone 2015
 - Shanghai 2015
 - Puerto Rico 2016
 - SOT 2016
 - Keystone 2016
 - ASHG 2016



<http://epigenomegateway.wustl.edu/support/>

WashU EpiGenome Browser Support

Tutorial Video

Workshops

Tutorial Book

- Download a [PDF](#) version.

Tutorial Video

Please go to the [Video page](#) to view video tutorials.

Workshops

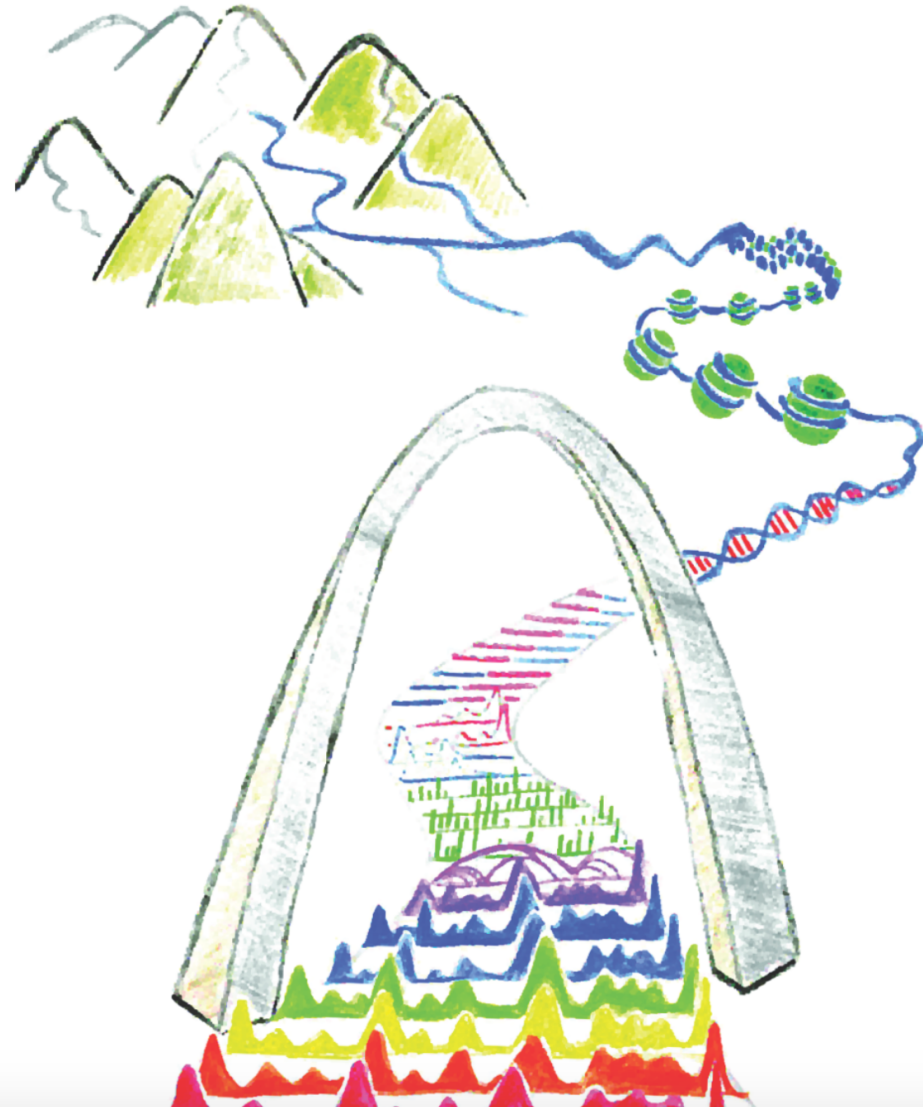
- [Workshop at 2016 Keystone Symposia](#).
- [Workshop at SOT 2016 Satellite Meeting](#).
- [Workshop at EPIGENOMICS 2016 Conference](#).
- [Workshop at The First International Epigenomics Conference 2015](#).
- [Workshop at 2015 Keystone Symposia: Keystone joint meeting on Epigenomics and DNA methylation](#)
- [Workshop at 2014 ASHG: Epigenomic Annotation of Genetic Variants Using The Washington University Epigenome Browser](#).

Please go to the [Workshops page](#) for details.

Resources

- [WashU EpiGenome Browser](#)
- [Roadmap EpiGenome Browser](#)
- [Wiki](#)
- [Publications](#)

1. Xin Zhou, Daofeng Li, Bo Zhang, Rebecca F Lowdon, Nicole B Rockweiler, Renee L Sears, Pamela A F Madden, Ivan Smirnov, Joseph F Costello and Ting Wang, **Epigenomic annotation of genetic variants using the Roadmap Epigenome Browser**, [Nature Biotechnology \(2015\)](#)



Resources associated with the workshop

- **Booklet (physical and online)**
 - Complete tutorial of the WashU EpiGenome Browser
 - Supporting websites, publications, and contacts
 - Survey
- **Handout (online)**
 - Step-by-step instructions of examples in workshop
 - Sample genes, SNPs, and datasets
 - Multiple re-starting points (saved Browser sessions)
- **Websites**
 - <http://epigenomegateway.wustl.edu/browser>
 - The main Browser website
 - <http://epigenomegateway.wustl.edu/support/>
 - General support and information
 - <http://epigenomegateway.wustl.edu/support/workshop2016sot.html>
 - Support page for Workshop@SOT2016

Acknowledgement

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Roadmap Consortium

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Epigenome Roadmap Project

NIH U01ES017154,
R01HG007354,
R01HG007175,
R01ES024992
U01CA200060

American Cancer Society
RSG-14-049-01-DMC
March of Dimes
Mallinckrodt Foundation

chr7:27132388-27132983

+ -1/3 -1 -5 < >

One bp spans 2 pixels

Tracks Apps



10.01



Sample Assay

