NIAGADS Update

September 2015 ADC Director's Meeting

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NIAGADS

New data at NIAGADS

ADSP Data and how to link to your ADC information

NIAGADS Genomics DB

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Datasets at NIAGADS

34 datasets | *49,000* subjects | 30 *billion* genotypes

- **16 GWAS**
- 1 eGWAS
- 1 Expression
- 1 Linkage
- 9 Genotyping (<100k)
- 6 Summary Statistics
- 1 Whole Exome Sequencing
- 11 GWAS datasets with Imputation

Incoming Datasets:

- 2 Targeted Sequencing
- 3 GWAS
- 3 Summary Statistics
- 1 Exome Chip
- 1 PSP WES
- 2 Linkage

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ADSP Data

- Raw data are available
  - WGS: 578 individuals / 111 multiplex families
  - WES: 10,939 samples/10,959 individuals
  - **3,264 WES are ADC subjects**
- Genotypes
  - WGS: July
  - WES: October/November
- See ADSP website (www.niagads.org/adsp) for more information on
  - Study design
  - Apply for data access

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Apply for ADSP data access

Go to **www.niagads.org/adsp** , click **Apply for Data**

- All applications submitted to dbGaP, reviewed by NIH
- ADSP requires:
  - **Secondary/derived data return plan** that will be generated by your study and deposited into NIAGADS
  - Signed **NIA Data Sharing Plan** and **NIAGADS Data Distribution Agreement** for ADSP
- Contact NIAGADS (data@niagads.org) for data application, we'd be glad to help step-by-step

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Linking ADSP WES ADC samples

- ADSP WES data are labeled using ADSP IDs

  e.g. *A-ADC-AD003257-BR-NCR-08AD11443*

- ADCs can link with their own phenotypic data with these steps:

- Contact NIAGADS (data@niagads.org) if you plan to link the samples and we'll walk you through the process

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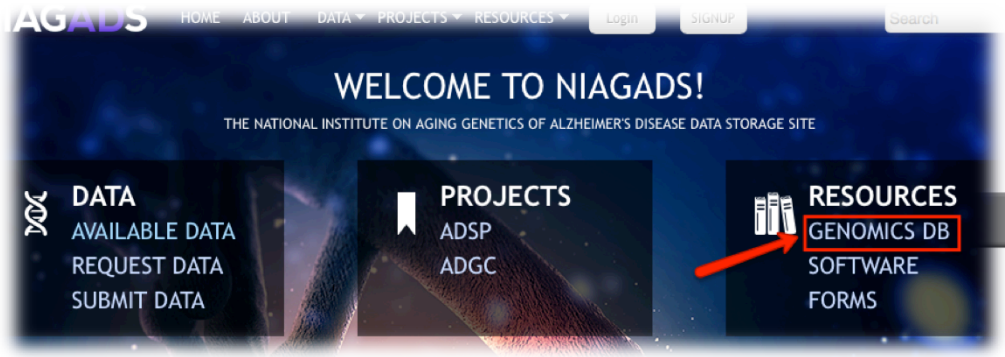
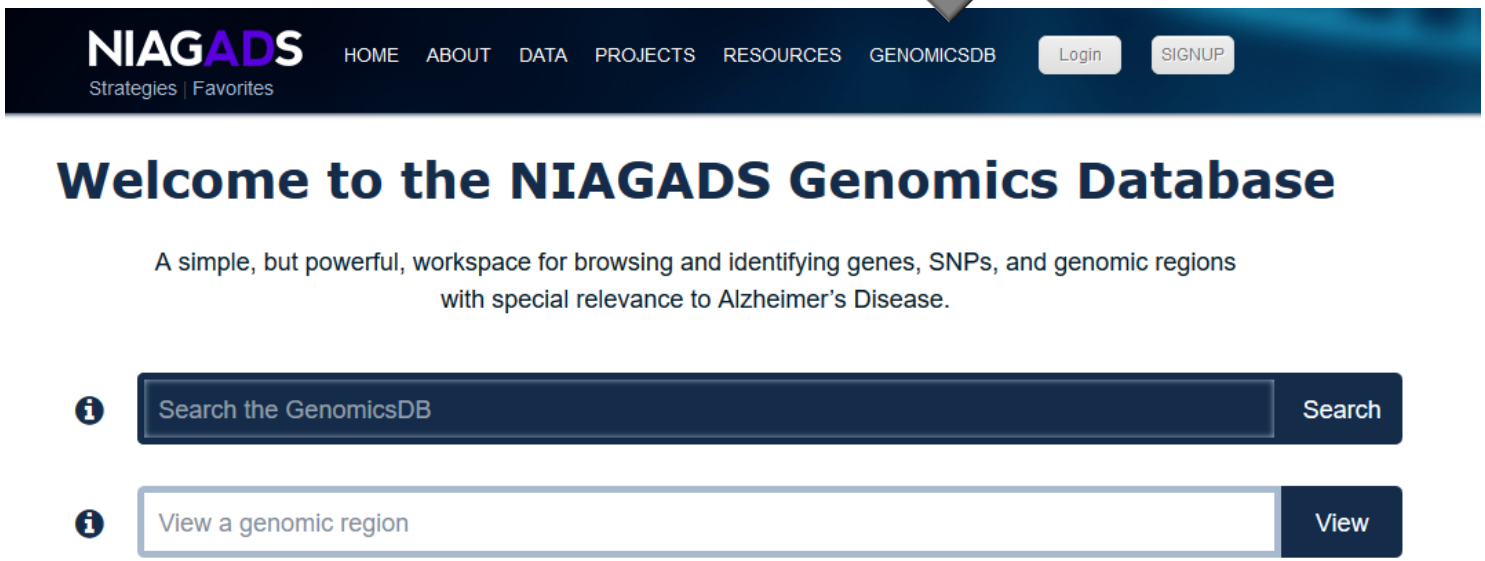
NIAGADS Genomics Database



Available October 2015
at www.niagads.org/genomics



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New Search Page

GENES

FIND A SNP

Enter a dbSNP rs identifier to view details and curated annotations for a specific SNP.

SNPs

rs6656401

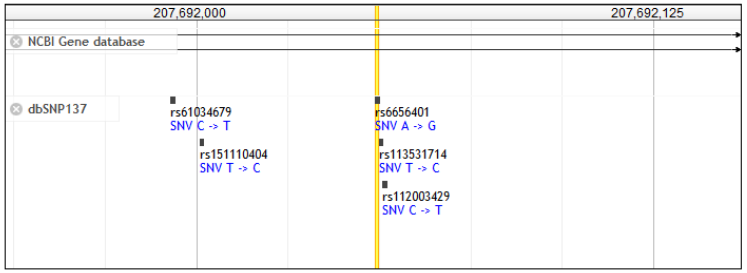
GENOMIC REGIONS

Enter a genomic region

SNP rs6656401

TTTCCTTCTCTGTCTCCATCTTCTC[G/A]TCGCCTTCTCCTCTGTGTGTGTCCT

Genomic Context



dbSNP137 SnpEff Effect

- High
- Moderate
- Low
- N/A

CHR1:207692049

- **Allele**: A
- **Minor Allele/Frequency**: G/0.9333

ADDITIONAL INFORMATION

NIAGADs datasets in which SNP rs6656401 has a GWAS significance supported by a p-value ≤ 1×10^{-8}.

Click on accession numbers to view a detailed report about the dataset or to request access to the data.

Use the provided links to **view the dataset on the GenomicsDB genome browser** or use the GenomicsDB to **search the dataset** for a complete list of significant SNPs.

GWAS Significance in NIAGADS Datasets

Show 10 entries

Accession	Dataset			
NG00036	IGAP 2013: Stages 1 and 2			
		7.76e-15	G	View Track | Search
		3.39e-10	A	View Track | Search
		1.91e-08	A	View Track | Search
	ted for Age, Sex and APOE	3.31e-08	A	View Track | Search
	Age, Sex and APOE	5.89e-08	A	View Track | Search
		2.57e-03	A	View Track | Search
NG00041	Neuropathologic features of AD and related dementias (case/control)	1.38e-02	A	View Track | Search
NG00041	Neuritic plaques (presence vs. absence); relaxed	3.98e-02	A	View Track | Search
NG00027	ADGC 2011: Stage 2 Adusted for Age, Sex and APOE	5.25e-02	A	View Track | Search

Showing 1 to 10 of 22 entries

Previous 1 2 3 Next

With a single-click, discover SNPs with GWAS significance in published NIAGADs datasets

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New Gene and SNP Report Pages

APOE

apolipoprotein E

Also known as: APO-E, LPG, LDLCQ5, AD2

Bookmark records or add to a basket

Add to Basket Add to Favorites

CONTENTS

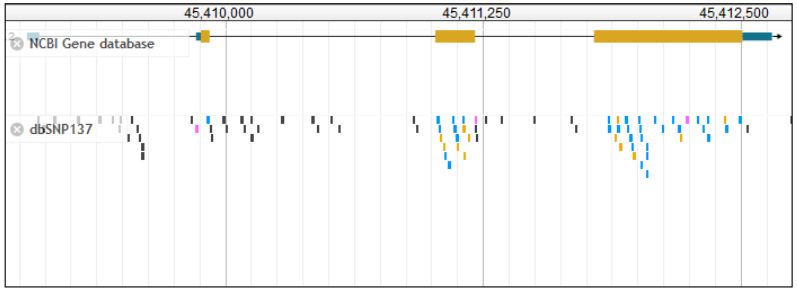
- Genomic Context
- Associated SNPs
- GO Terms
- KEGG Pathways

LINKS TO OTHER RESOURCES

- NCBI EntrezGene: 348
- HUGO: HGNC:613
- ENSEMBL: ENSG00000130203
- VEGA: OTTHUMG00000128901
- OMIM: 107741
- PUBMED

Link to other databases with a single click.

⊟ Genomic Context



dbSNP137 SnpEff Effect

- High
- Moderate
- Low
- N/A

CHR19, (45409039..45412650)

- Explore annotations
- View on genome browser

⊟ Co-located SNPs

312 SNPs are co-located with APOE. Retrieve full listing.

⊞ With Clinical Significance

⊟ Associated with Alzheimer's Disease

Show 10 entries Filter:

SNP	Chromosome	Position	Disease Trait	p-value	Citation	Variant Type
rs429358	chr19	45411941	Cerebrospinal AB1-42 levels in Alzheimer's disease dementia	3.98e-17	25027320	missense variant
rs429358	chr19	45411941	Alzheimer's disease biomarkers	5.01e-14	23419831	missense variant
rs429358	chr19	45411941	Alzheimer's disease biomarkers	1.00e-06	21123754	missense

Quickly find significant SNPs

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Additional Search Functions

GENES

FIND A SNP

Enter a dbSNP rs identifier to view details and curated annotations for a specific SNP.

Go

More

SNPs

rs6656401

Go

More

GENOMIC REGIONS

Enter a genomic region

Go

Sample Strategies

Upload a list of locations

Expressed Enhancers

Brain-specific expression?

chr19:35409039..65412650

Transcription Factor Binding Sites

Histone Modifications

DNase I Hypersensitivity Sites

GWAS Significance

More

FIND EXPRESSED ENHANCERS WITHIN A REGION OF INTEREST

Search pre-defined enhancer sets for brain-relevant tissues and cells from FANTOM5.

Enter a genomic location in the format chrN:start..end (e.g., chr19:35409039..65412650) to find all expressed enahncers within that region.

Explore further to make novel discoveries

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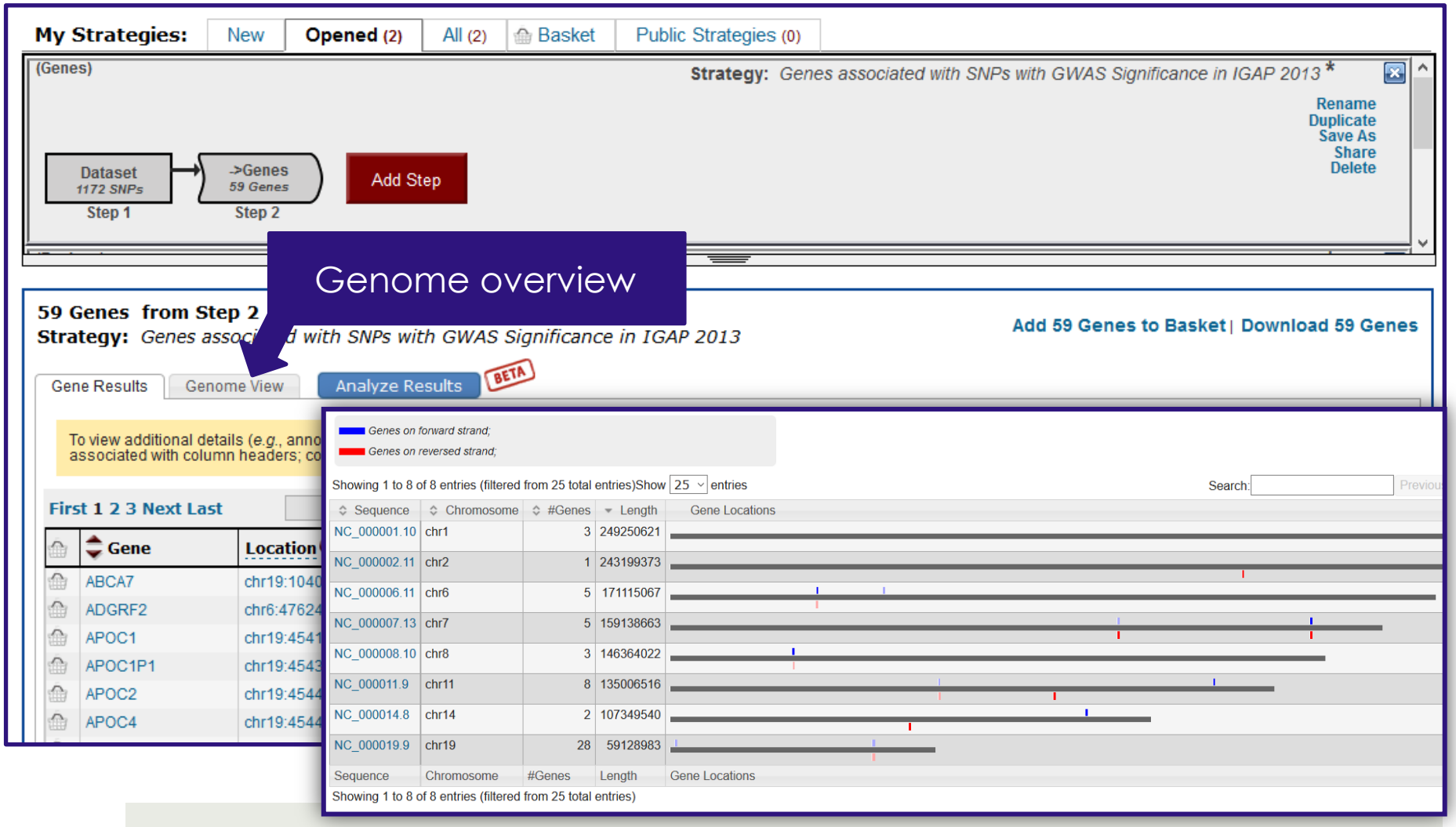
Explore and Analyze Gene Functions



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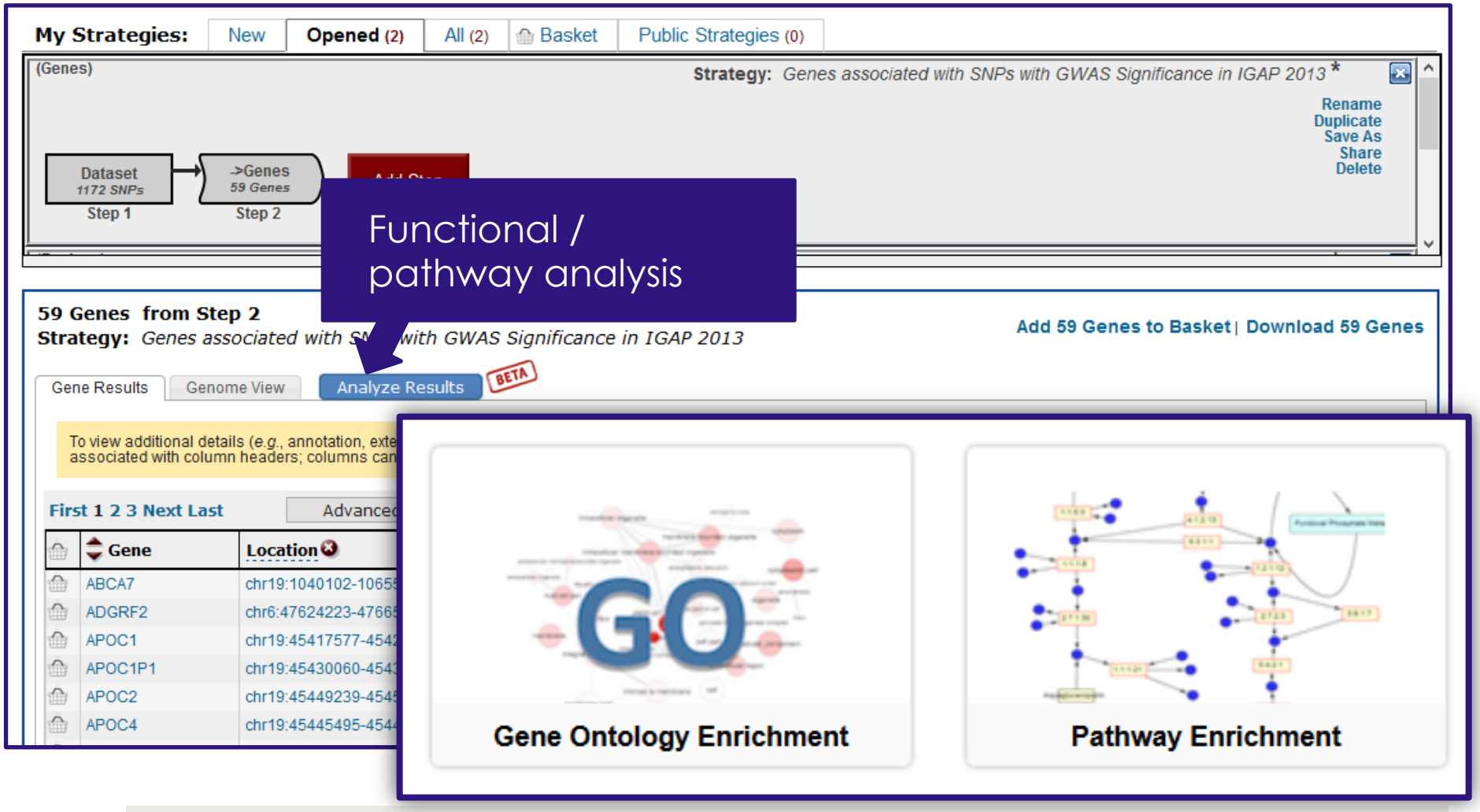
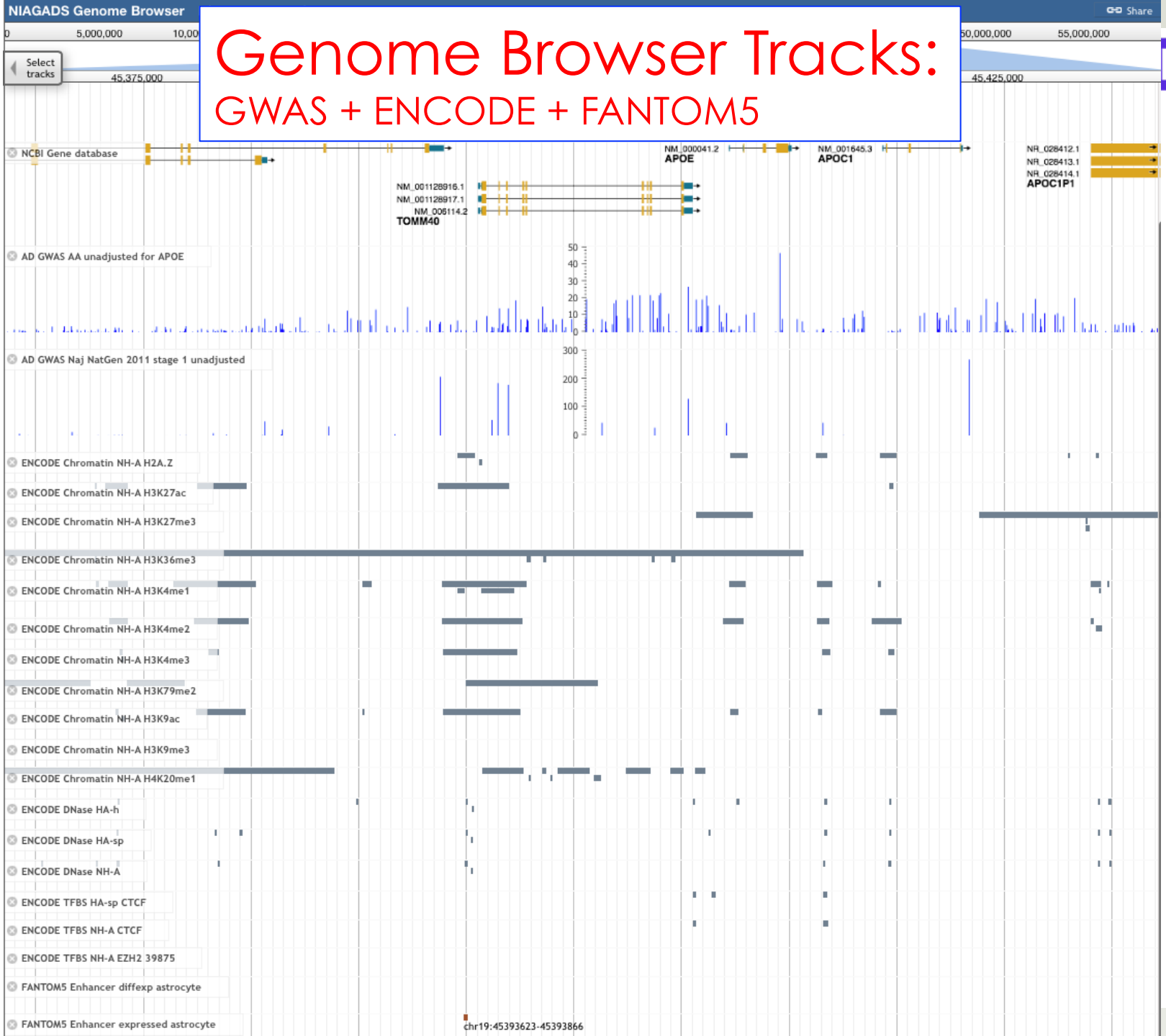
New Result Pages: Explore and Analyze



Genome Browser Tracks:

GWAS + ENCODE + FANTOM5



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October Release

- Currently contains the following data
  - **Genes** and pathway annotations
  - **SNP** information (dbSNP v142) with population allele frequency and SNPEff impact predictions
  - Published **AD GWAS** summary statistics
  - NHGRI GWAS Catalog
  - **Functional genomics** data relevant to brain
    - ENCODE: DNaseI HS / Histone modification / TF Binding ChIP-Seq
    - FANTOM5: Enhancer-TSS associations / Cell-expressed enhancers
- Planned data
  - Gene-gene interactions
  - Gene expression tissue specificity
  - Cross-species conservation (PhastCons)
  - Genome interaction database
  - Structural variant calls (dbVar/DGV/CNVD)
  - GTex express QTL

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Take-home message
-- please share with your ADC

- New datasets at NIAGADS
- **ADSP genotypes** for WGS (available now) and WES (October ~ November)
- **Linking ADSP WES samples** with ADC's own phenotype data – contact NIAGADS so we can help you
- Improved **NIAGADS Genomics Database** will be available in October

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Acknowledgements

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