Informatics Core

Arthur Toga

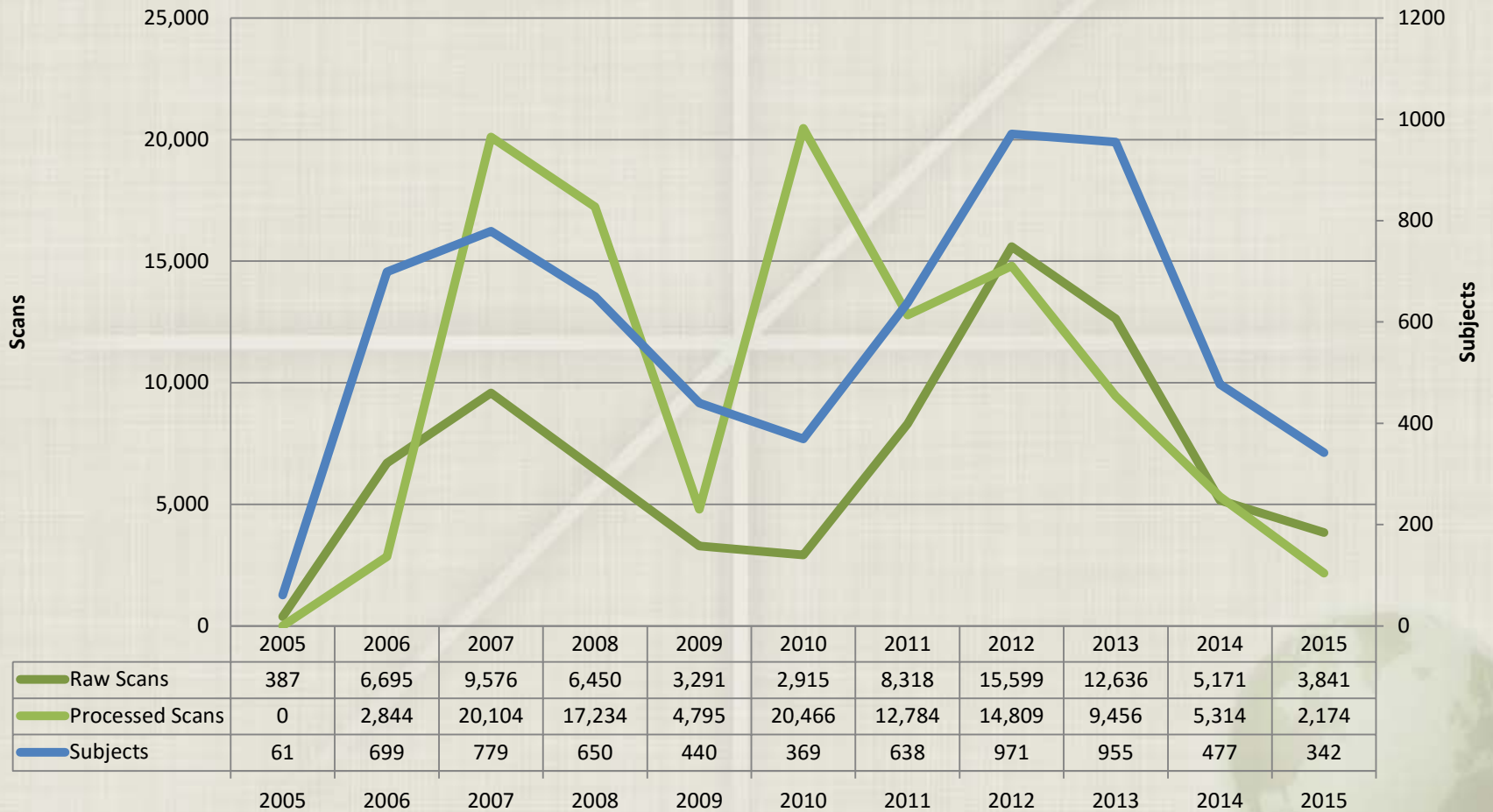April 2016

State of the Archive

ADNI REPOSITORY

Over 209,000 Images Archived

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Raw Scans	387	6,695	9,576	6,450	3,291	2,915	8,318	15,599	12,636	5,171	3,841
Processed Scans	0	2,844	20,104	17,234	4,795	20,466	12,784	14,809	9,456	5,314	2,174
Subjects	61	699	779	650	440	369	638	971	955	477	342

Dataset Summary by Category

Clinical & Analysis

- Assessments - 21
- Biospecimen - 69
- Enrollment - 11
- Imaging - 93
- Medical History - 13
- Study Info - 14
- Subject Characteristics – 3
- Test Data (Challenges, etc)- 3

Archived

    (older dated versions) – 122

Genetic

- ADNI WGS + Omni2.5M - 54
- ADNI1 GWAS - 15
- ADNIGO/2 GWAS - 18
- ADNI Gene Expression - 2

New Datasets
Mid-2015 to present

- Araclon Biotech S.L. - AB test40 and 42 Plasma Analysis
  - Levels of Aβ40 and Aβ42 free in plasma
- UC Berkeley - AV1451 Analysis
  - AV1451 SUVR
- AD Metabolomics Consortium Bile Acids
  - Levels of selected bile acids in human serum
- AD Metabolomics Consortium Barcelona Purines
  - Quantify metabolites belonging to purine metabolism in human plasma
- ADMC Duke Biocrates P180 Kit Flow injection analysis
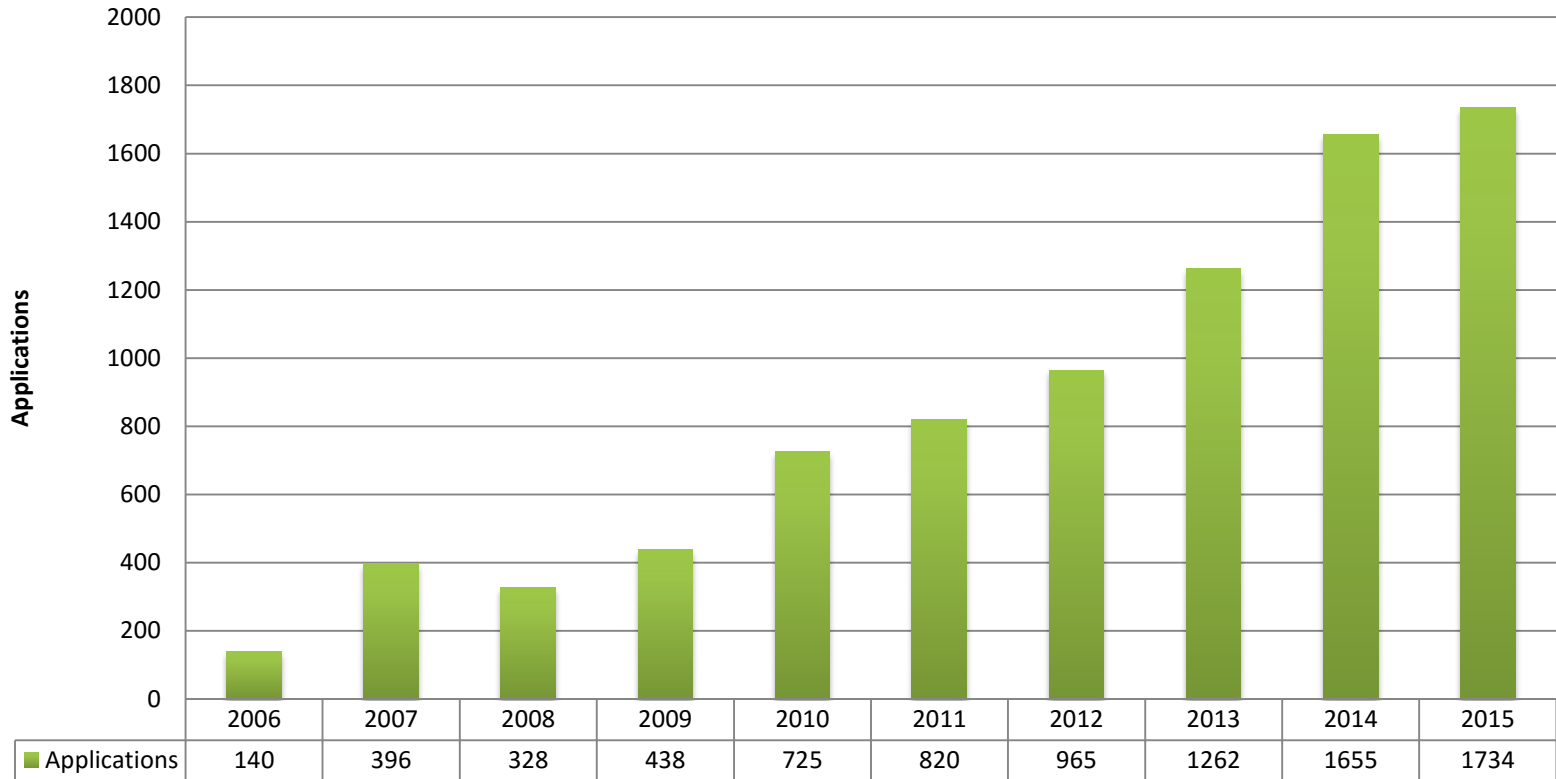 - Measure 186 metabolites

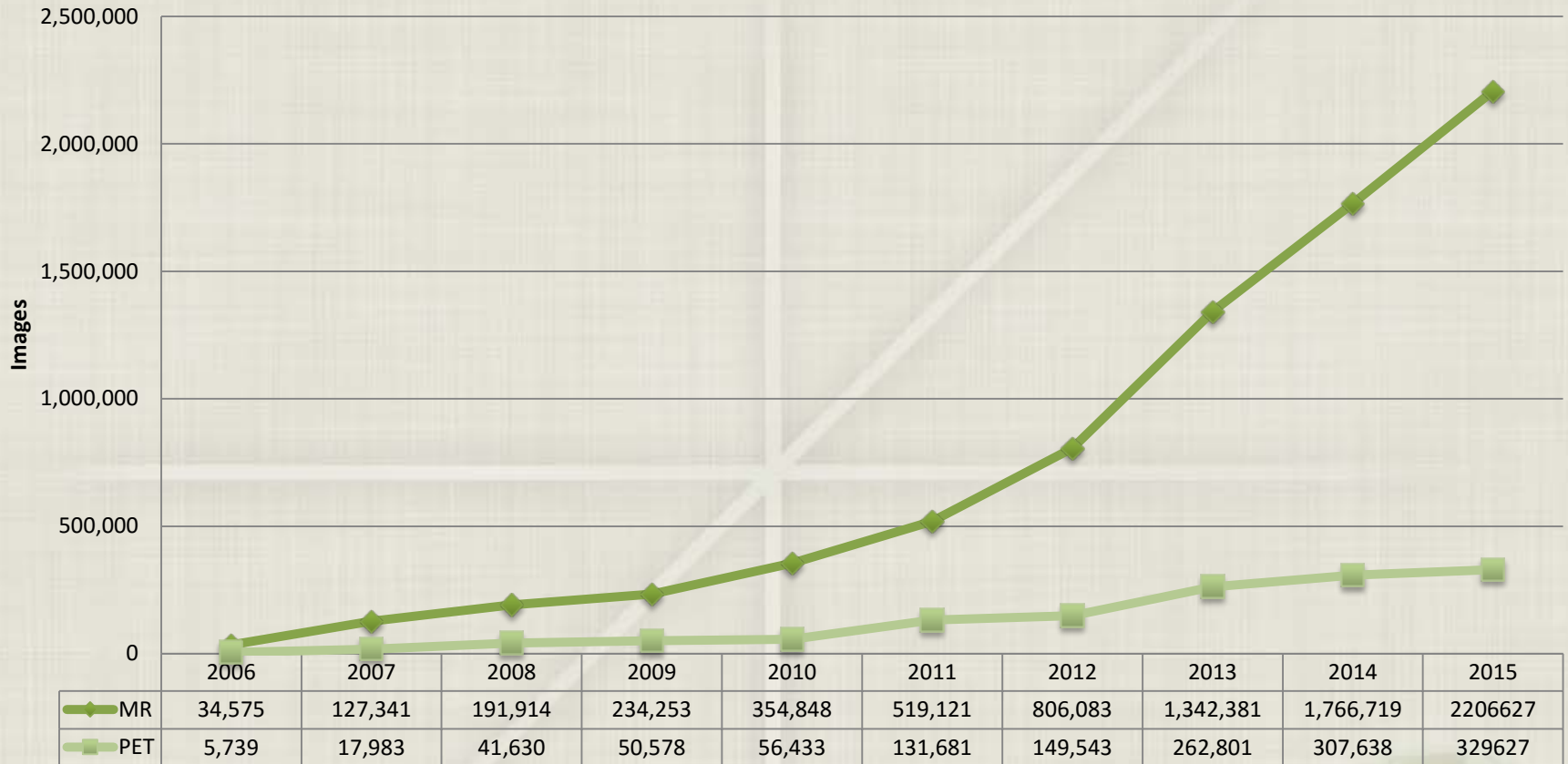Downloads & Access

DATA ARCHIVE ACTIVITY

Data Use Applications Received

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Applications	140	396	328	438	725	820	965	1262	1655	1734

Applications received to date: 8,463

Images Downloaded 2008 - 2015

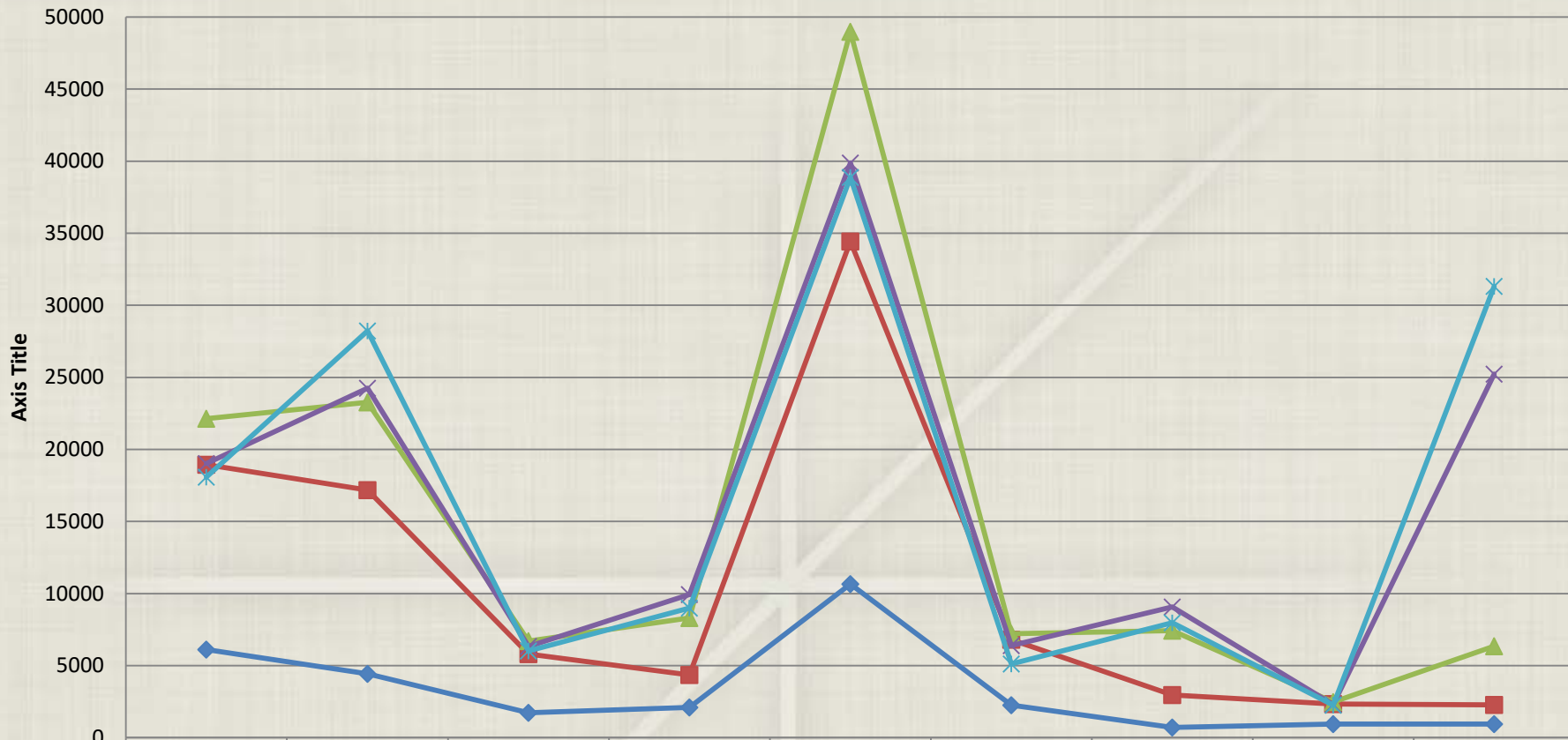|	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
MR	34,575	127,341	191,914	234,253	354,848	519,121	806,083	1,342,381	1,766,719	2206627
PET	5,739	17,983	41,630	50,578	56,433	131,681	149,543	262,801	307,638	329627

MRI: 7,583,862

PET: 1,353,653

Total: 8,937,515

	Assessments	Biospecimen	Enrollment	Genetic	Imaging	Medical History	Study Info	Subject Characteristics	Archived
2011	6125	4424	1736	2106	10663	2264	702	955	938
2012	18945	17177	5801	4344	34435	6810	2959	2334	2270
2013	22130	23273	6706	8300	48980	7220	7422	2477	6345
2014	19029	24244	6337	9936	39872	6397	9066	2301	25230
2015	18089	28225	6026	9003	38876	5123	7968	2260	31312

Clinical Data Downloaded 2011 - 2015

WHOLE GENOME SEQUENCING DATA

Processes for obtaining WGS data


```
                          ┌─────────────┐
                          │  WGS Data   │
                          └──────┬──────┘
                  ┌──────────────┴──────────────┐
          ┌───────────────┐            ┌───────────────┐
          │  SNV+Indel    │            │   Assembly    │
          │    (VCF)      │            │    (BAM)      │
          └───────┬───────┘            └───────┬───────┘
          ┌───────┴───────┐    ┌──────┬────────┼────────┬────────┐
      ┌────────┐  ┌──────────┐ ┌────────┐ ┌────────┐ ┌────────┐ ┌────────┐
      │  1)    │  │   2)     │ │  1)    │ │  2)    │ │  3)    │ │  4)    │
      │Login IDA│ │ Genetic  │ │ Email  │ │Added to│ │ Send   │ │Receive │
      │        │  │Downloads │ │Request │ │ Queue  │ │Hardware│ │ Data   │
      └────────┘  └──────────┘ └────────┘ └────────┘ └────────┘ └────────┘
```
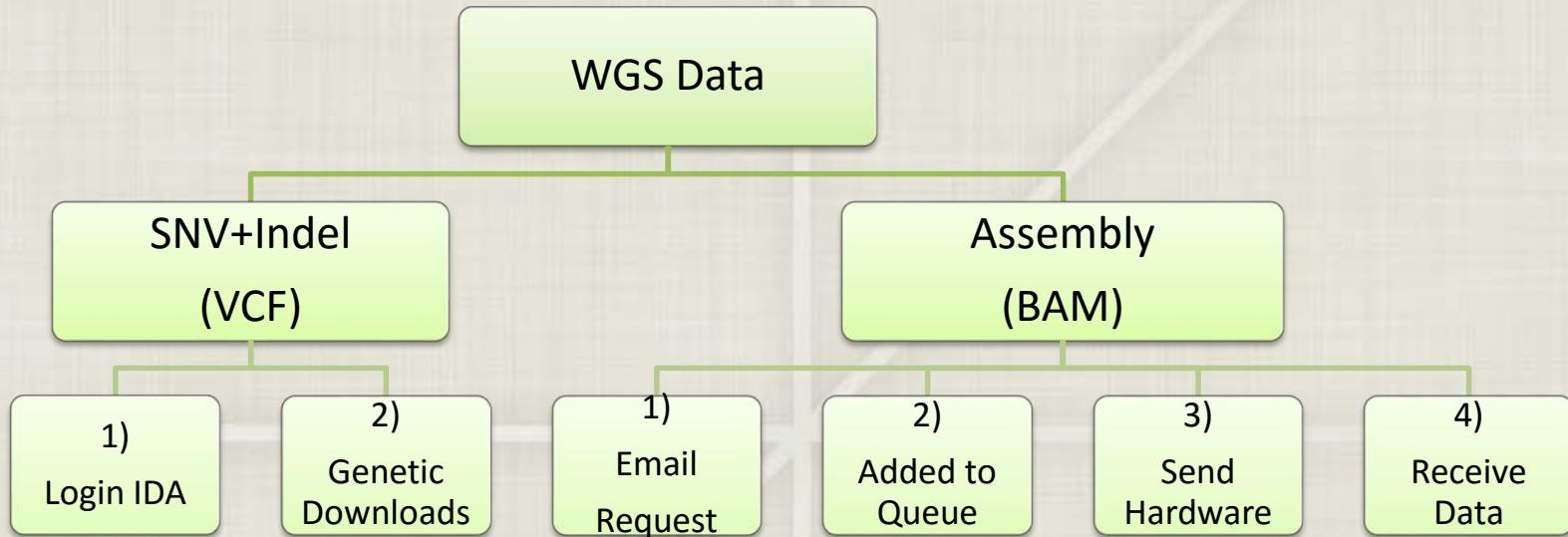
SNV+Indel data: downloaded by 484 investigators
WGS requests filled: 14 (100%)
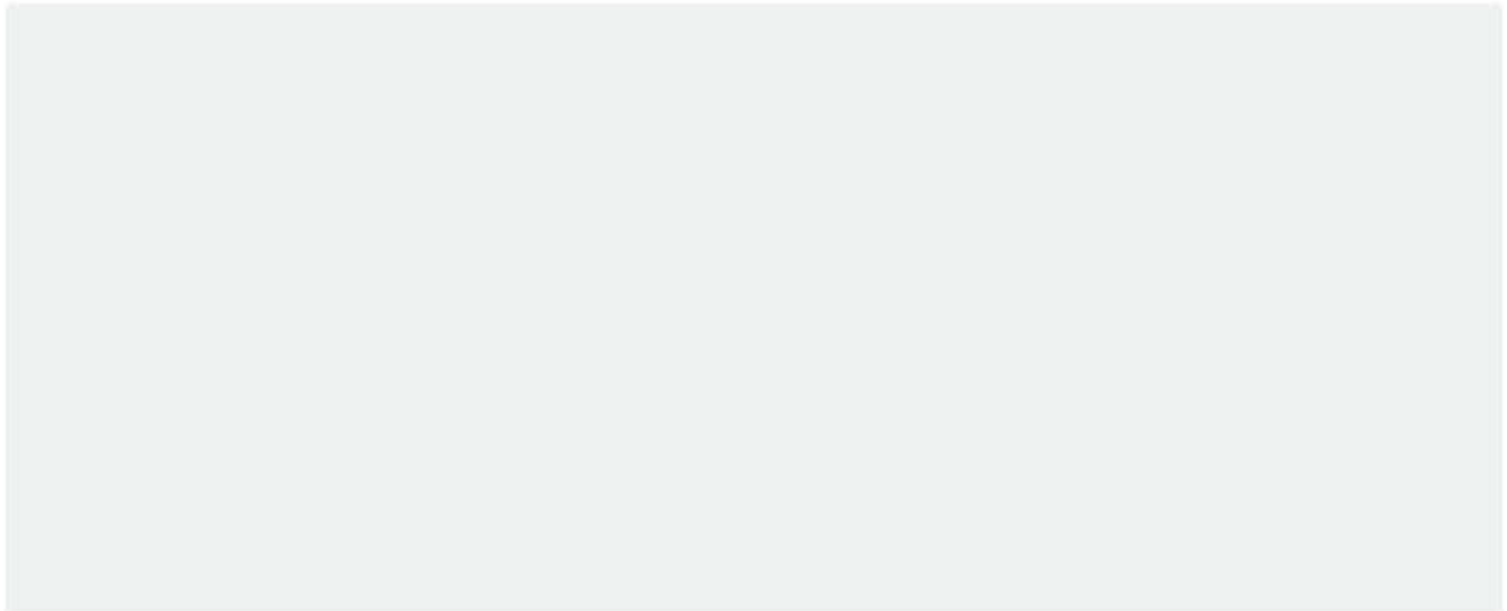
WGS BAM File Requests

Requests received: 32

Requests completed: 19

Copies in progress: 0

Requests withdrawn/non responsive: 13

Preview of coming attractions

With apologies to the Beach Boys
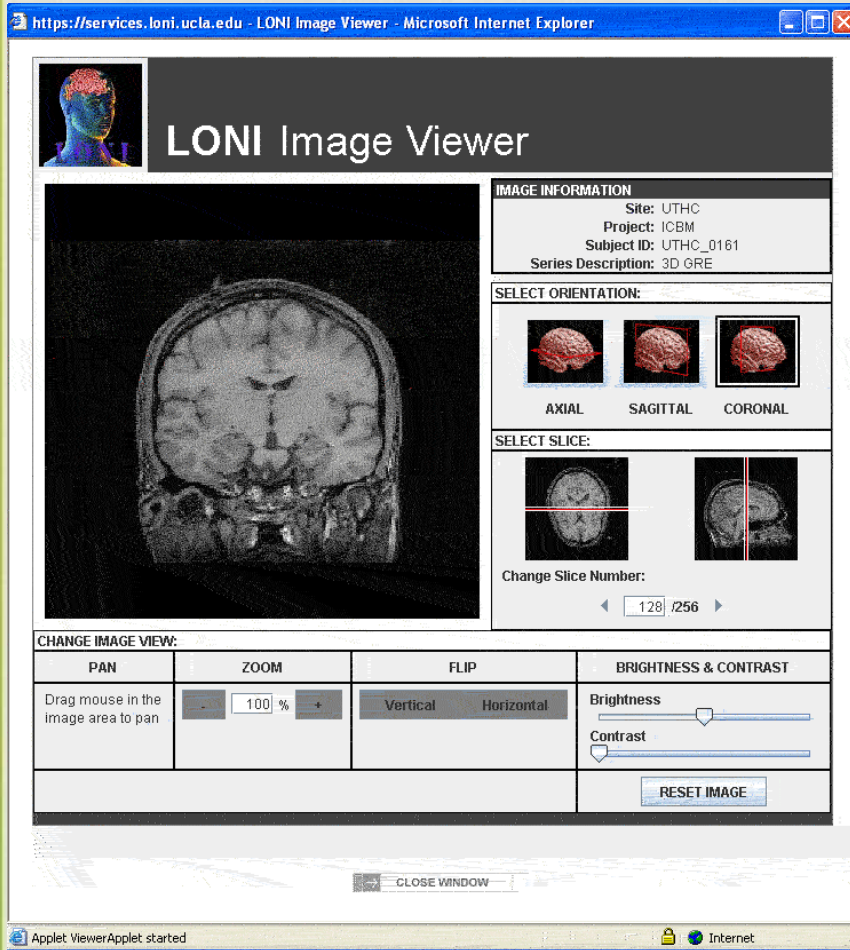
SURFIN' USA

Web Technology Continually changes

- Java plug-in support being phased out
- New IDA widgets in development for:
  - Uploading Images
  - Downloading Images
  - Viewing Images

www.nydailynews.com

The New IDA Viewer Design

- Going mobile – will be responsive for different screen sizes
- Designs in progress for upload, download, search interfaces

Share your opinion:

LONI IDA Image Viewer: User Survey [v01]
Thank you for your time! This survey will help IDA build a better Image Viewer.
The survey has 9 questions on 2 pages and will take 1 – 3 minutes to complete.
Required questions are marked with an (*)

Page 1 of 2: LONI Image Viewer User Survey - Questions 1 - 5

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*1. With what role(s) do you identify most closely? (check all that apply)

☐ Scientific researcher

☐ PI

☐ Program administrator or manager

☐ Neurologist or neurological surgeon

☐ Radiologist

☐ University faculty

☐ Student

☐ Other (please specify)

2. If your function or role within your program or organization is unique and different from most of your colleagues, please provide details:

*3. What would you say is the one most amazing thing that you want to do with an image viewer application?

https://www.surveymonkey.com/r/KJDTMJS

With apologies to Bob Dylan

LIKE A ROLLING STONE

ADNI 3 MR Data Flow

Image Metadata

Site
subject 1 visit A

MR

Clinical Data

Raw Scans

ATRI

OK

OK

Clinical Data

Image Metadata

Clinical Data

Image Metadata

Raw & Pre-processed
Image Data

QC & Exceptions Data 3

MR QC Data

1

2

1. QC to LONI
2. Reconciliation of images
3. QC & exceptions to ATRI

Imaging Core QC

MR

Exceptions Data

Image Metadata

Processed images

Data Analysis

With apologies to the Beatles

COME TOGETHER

Forming IWWG

- Informatics & Website Working Group
  - Quarterly meeting via WebEx/TC
  - Representative from each core
- Goals
  - Share ideas for improving data search, download and other functionality
  - Guide website developments

Expert (and other) Input on

- Preferred ways to search the data
  - i.e. keyword search over what you want rather than how data was collected

- Preference for results
  - i.e. summarize first, then refine, add columns…
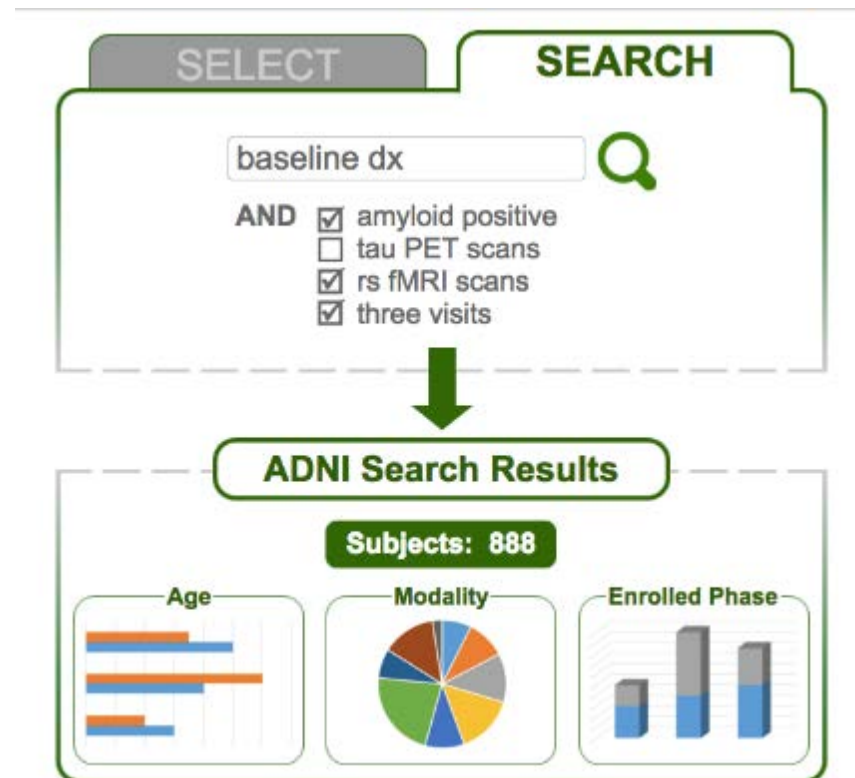
from the Users

A FEW WORDS…

Some feedback

- From an investigator in Germany:
  - "Thanks a lot for your very hard work maintaining the database, the new look sure is fancy!"

- From an interested party:
  - "During my brain MRI process yesterday, I felt heat around my head in a cold room. I am scared that some of my brain cells damaged."

Some unique research plans

- From an investigator in Vancouver, WA:
    - "Studying all the penis connectors"

- From an investigator in Bosnia:
    - "Ongoing project of housing a human brain into unique robotic body."

Some help requests

- From an investigator in the USA:
  - "Thanks a million again! Very impressed already how promptly and nicely you have responded."

- From a prospective user in Russia:
  - "My name is [withheld]. I'm from Russia. And I want to get out of here. Help! I need $10 000"