The Brain Imaging Data Structure PET extension

Gitte Moos Knudsen, Professor.

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10.6084/m9.figshare.18585953

Poll for the audience – question 1

Have you previously worked with PET data that you received from another lab?

Poll for the audience – question 2

Have you ever shared molecular neuroimaging data with researchers from other labs?

Positron Emission Tomography controversies

NeuroImage 84 (2014) 1094–1100

Contents lists available at ScienceDirect

NeuroImage

journal homepage: www.elsevier.com/locate/ynimg

Comments and Controversies

PET Neuroimaging: The White Elephant Packs His Trunk?

Paul Cumming *

Department of Nuclear Medicine, University of Erlangen-Nuremberg, Erlangen, Germany

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Paul Cumming *

Department of Nuclear Medicine, University

NeuroImage 94 (2014) 408–410

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Comments and Controversies

PET neuroimaging: The elephant unpacks his trunk Comment on Cumming: "PET neuroimaging: The white elephant packs his trunk?"

Roger N. Gunn[a,b,c,*], Eugenii A. Rabiner[a,d]

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[b] *Division of Brain Sciences, Department of Medicine, Imperial College, London, UK*
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[d] *Centre for Neuroimaging Sciences, Institute of Psychiatry, King's College, London, UK*

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NeuroImage 84 (2014) 1104–1106

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Comments and Controversies

The white elephant revived: A new marriage between PET and MRI

Comment to Cumming: "PET Neuroimaging: The White Elephant Packs His Trunk?"

Hartwig R. Siebner [a,*], Antonio P. Strafella [b,c], James B. Rowe [d,e]

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[d] Department of Clinical Neurosciences, Cambridge University, Cambridge, UK

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Standard nomenclature

Journal of Cerebral Blood Flow & Metabolism (2007) 27, 1533–1539
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www.jcbfm.com

Review Article

Consensus nomenclature for *in vivo* imaging of reversibly binding radioligands

Robert B Innis[1], Vincent J Cunningham[2], Jacques Delforge[3], Masahiro Fujita[1], Albert Gjedde[4], Roger N Gunn[5], James Holden[6], Sylvain Houle[7], Sung-Cheng Huang[8], Masanori Ichise[9], Hidehiro Iida[10], Hiroshi Ito[11], Yuichi Kimura[12], Robert A Koeppe[13], Gitte M Knudsen[14], Juhani Knuuti[15], Adriaan A Lammertsma[16], Marc Laruelle[2], Jean Logan[17], Ralph Paul Maguire[18], Mark A Mintun[19], Evan D Morris[20], Ramin Parsey[9], Julie C Price[21], Mark Slifstein[9], Vesna Sossi[22], Tetsuya Suhara[11], John R Votaw[23], Dean F Wong[24] and Richard E Carson[25]

[1]National Institute of Mental Health, Bethesda, Maryland, USA; [2]GlaxoSmithKline and Imperial College, London, UK; [3]CEA/DSV/SHF, Orsay, France; [4]University of Aarhus, Aarhus, Denmark; [5]GlaxoSmithKline and University of Oxford, London, UK; [6]University of Wisconsin, Madison, Wisconsin, USA; [7]Centre for Addiction and Mental Health & University of Toronto, Toronto, Ontario, Canada; [8]UCLA School of Medicine, Los Angeles, California, USA; [9]Columbia University, New York, New York, USA; [10]National Cardiovascular Center Research Institute, Suita City, Osaka, Japan; [11]National Institute of Radiological Sciences, Chiba, Japan; [12]Tokyo Metropolitan Institute of Gerontology, Tokyo, Japan; [13]University of Michigan, Ann Arbor, Michigan, USA; [14]Copenhagen University Hospital Rigshospitalet, Copenhagen, Denmark; [15]Turku PET Centre, Turku, Finland; [16]VU University Medical Centre, Amsterdam, The Netherlands; [17]Brookhaven National Laboratory, Upton, New York, USA; [18]Pfizer Global R&D, Groton, Connecticut, USA; [19]Washington University School of Medicine, St Louis, Missouri, USA; [20]Indiana University-Purdue University, Indianapolis, Indiana, USA; [21]University of Pittsburgh, Pittsburgh, Pennsylvania, USA; [22]University of British Columbia, Vancouver, British Columbia, Canada; [23]Emory University, Atlanta, Georgia, USA; [24]Johns Hopkins University School of Medicine, Baltimore, Maryland, USA; [25]Yale University, New Haven, Connecticut, USA

Consensus on publishing PET experiments

- Replication in science can be improved with standards for reporting and sharing of primary research data

Opinion

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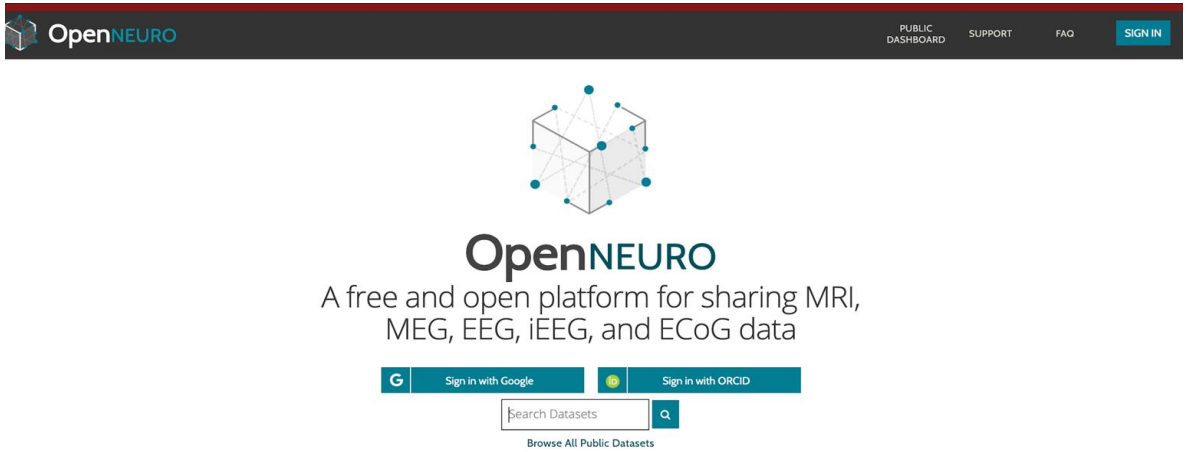
Guidelines for the content and format of PET brain data in publications and archives: A consensus paper

Gitte M Knudsen[1], Melanie Ganz[1], Stefan Appelhoff[2], Ronald Boellaard[3], Guy Bormans[4], Richard E Carson[5], Ciprian Catana[6], Doris Doudet[7], Antony D Gee[8], Douglas N Greve[6], Roger N Gunn[9], Christer Halldin[10], Peter Herscovitch[11], Henry Huang[5], Sune H Keller[12], Adriaan A Lammertsma[3], Rupert Lanzenberger[13], Jeih-San Liow[14], Talakad G Lohith[15], Mark Lubberink[16], Chul H Lyoo[17], J John Mann[18], Granville J Matheson[10], Thomas E Nichols[19], Martin Nørgaard[1], Todd Ogden[20], Ramin Parsey[21], Victor W Pike[14], Julie Price[6], Gaia Rizzo[9], Pedro Rosa-Neto[22,23], Martin Schain[20], Peter JH Scott[24], Graham Searle[9], Mark Slifstein[21], Tetsuya Suhara[25], Peter S Talbot[26], Adam Thomas[27], Mattia Veronese[28], Dean F Wong[29], Maqsood Yaqub[3], Francesca Zanderigo[30], Sami Zoghbi[14] and Robert B Innis[14]

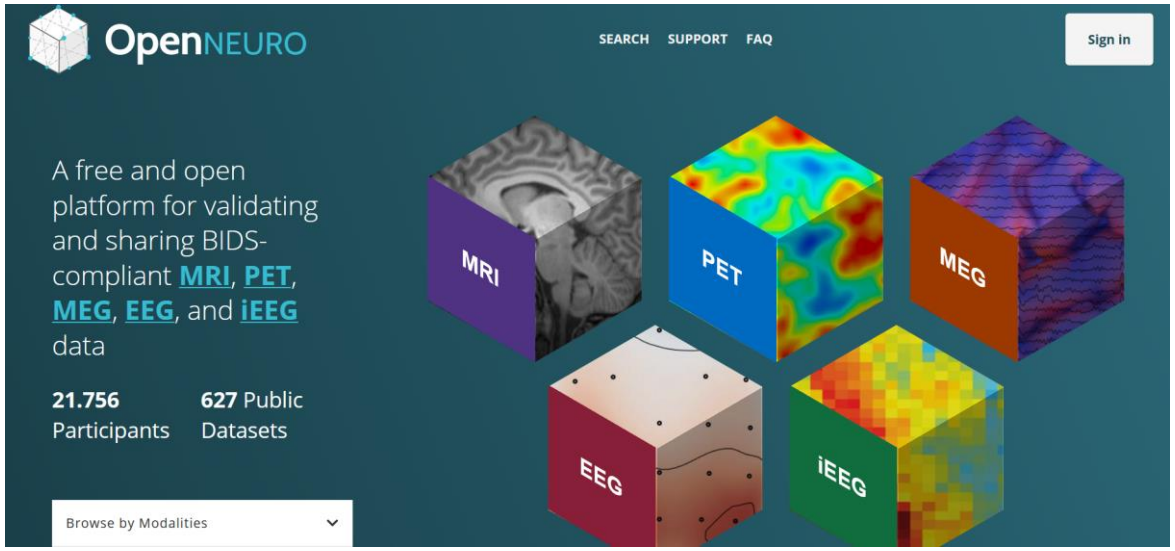
From OpenNeuro …

- Official repository for BRAIN Initiative
- Part of the Amazon Public Datasets project
- 627 public datasets
- 21.756 subjects / ~16 TB
- 10-20 new dataset uploads per
- month
- Serving 1000 + downloads/month (almost 20TB of data)
- Over 8K users/month



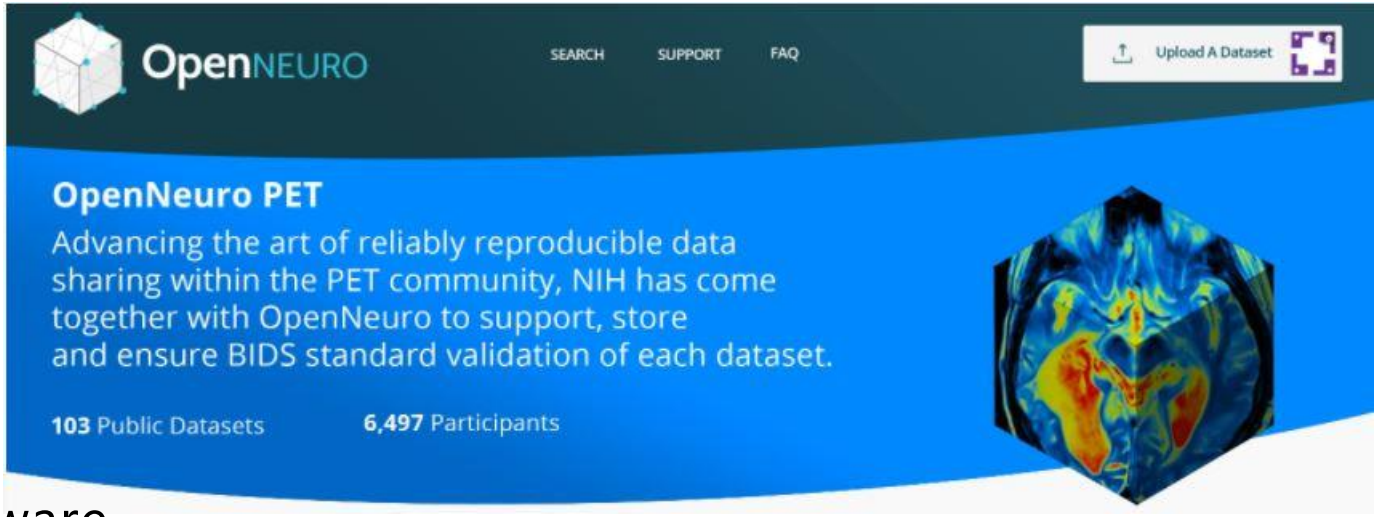
...to OpenNeuroPET

- Establish PET archive as an extension of OpenNeuro
  - Standard format and content
  - "Best Practices" for pipelines and QC checks
- Educate and seek feedback from the PET user community
- Establish average images of receptor density, connecting to the larger fMRI community



OpenNeuroPET

- Principles
  - Standard format to meaningfully share and combine data
  - Follow Guidelines, include “best practices” for data pipelines, and sample data sets for QC
- Benchmarks of success
  - Number of scans deposited
  - Number of resulting publications
- Community engagement
  - Provide help to sites
  - Integrate with commonly used software
  - Stimulate projects



OpenNeuroPET setup

OpenNeuroPET setup

PI: Robert Innis

Funding: NIMH via BRAIN Initiative (Brain Research through Advancing Innovative Neurotechnologies)

Duration: Oct 2021 – Sept 2026

Collaborator: NRU, Rigshospital; MGH

Consultant: Russell Poldrack (Stanford)

PI: Gitte Moos Knudsen

Funding: Novo Nordisk Foundation (Research Infrastructure program)

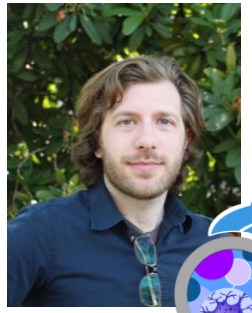
Duration: Jan 2021 – Dec 2025

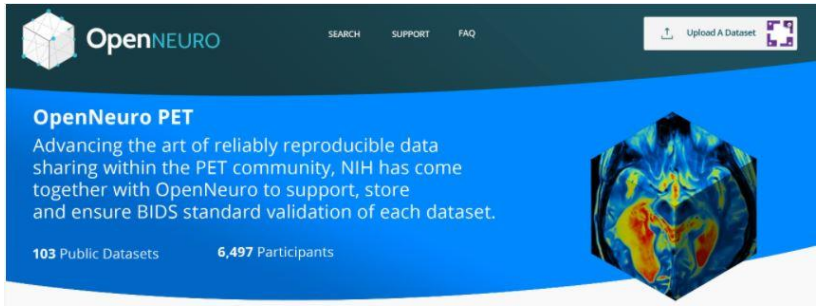
Collaborator: NIMH; MGH

Consultant: Russell Poldrack (Stanford)

NIH National Institute of Mental Health

Thank you!





NIH National Institute of Mental Health

novo nordisk fonden

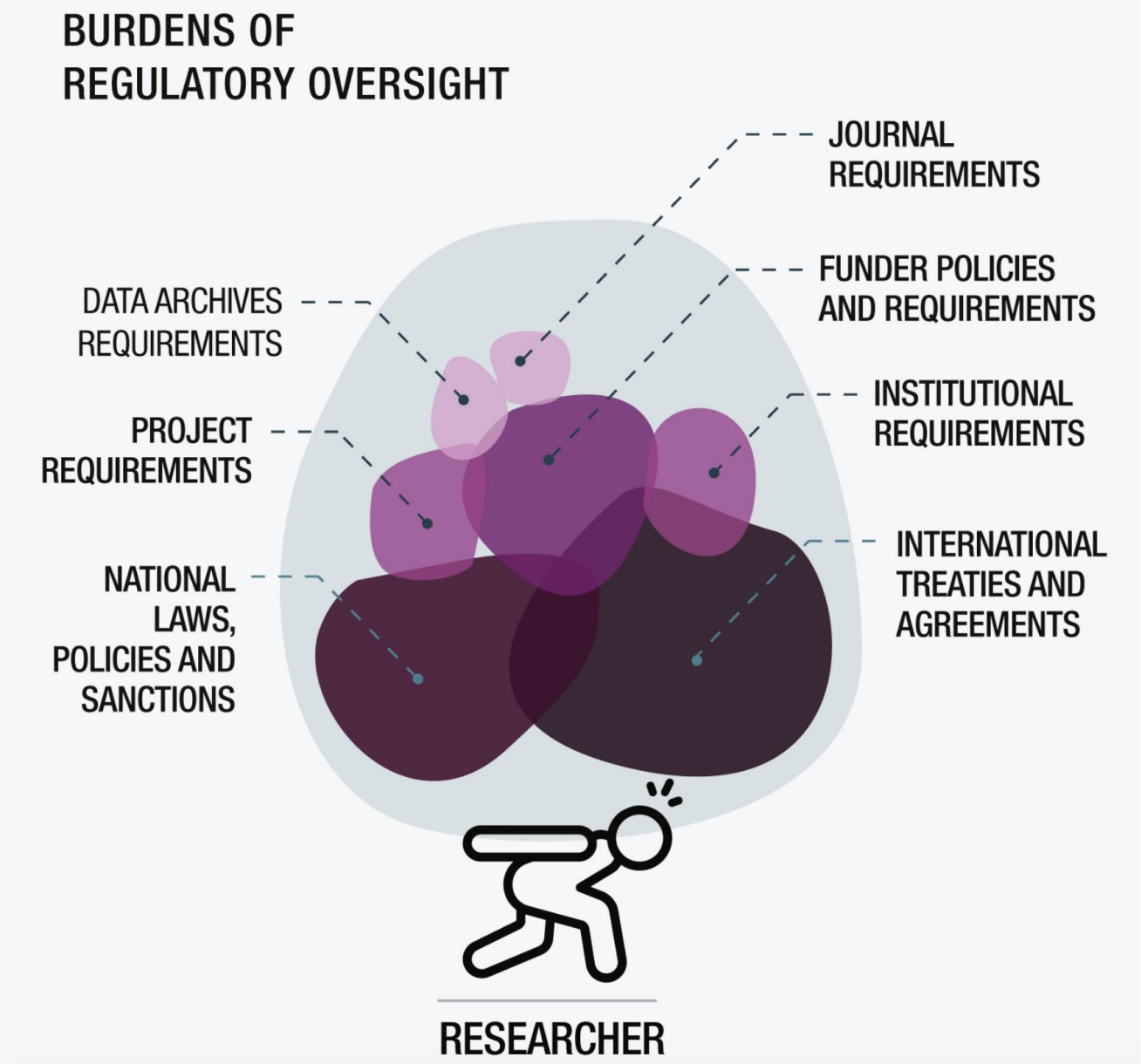
Athinoula A. Martinos Center For Biomedical Imaging

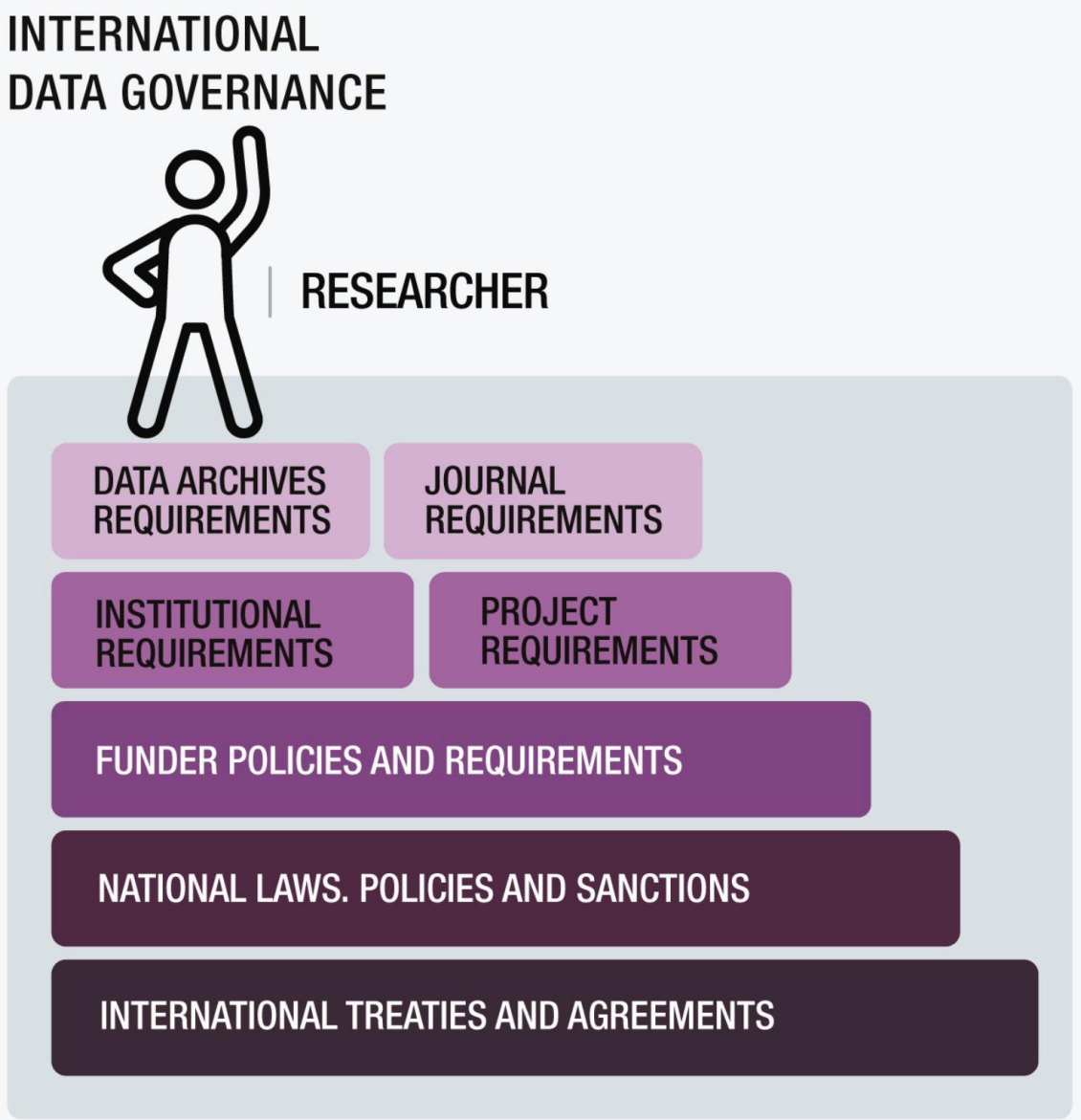
Harvard–MIT Health Sciences & Technology

MASSACHUSETTS GENERAL HOSPITAL

Stanford University

REGION Rigshospitalet





Credit: International Brain Initiative