



Brain Research in Poland Executive Summary

Włodzisław Duch

Neurocognitive Laboratory,
Center for Modern Interdisciplinary Technologies,
Nicolaus Copernicus University

Google: W. Duch

2018.10.16: Global Current and Emerging Brain Initiatives

Summary

- Polish Science
- PL in EMBL
- PL-US Collaboration
- PL INCF
- PL Grid HPC infrastructure
- Brain Plan for Poland



Still Emerging ...

Adolf Beck: discovery of EEG

Adolf Beck (1863, Kraków – 1942, Lwów), has described first EEG recordings of dog's brain through the skull.

„In 1890 he received the degree of M.D., and published the results of his extensive research on electrical processes in the brain”. His papers on this subject (in collaboration with Napoleon Cybulski), attracted wide attention in Germany, France, and England”



Adolf Beck (left) and his supervisor Napoleon Cybulski (right) in a photo taken in 1911. Cybulski was a Polish pioneer in neurophysiology and endocrinology and was the discoverer of adrenaline. He also developed a device for measuring blood flow velocity.

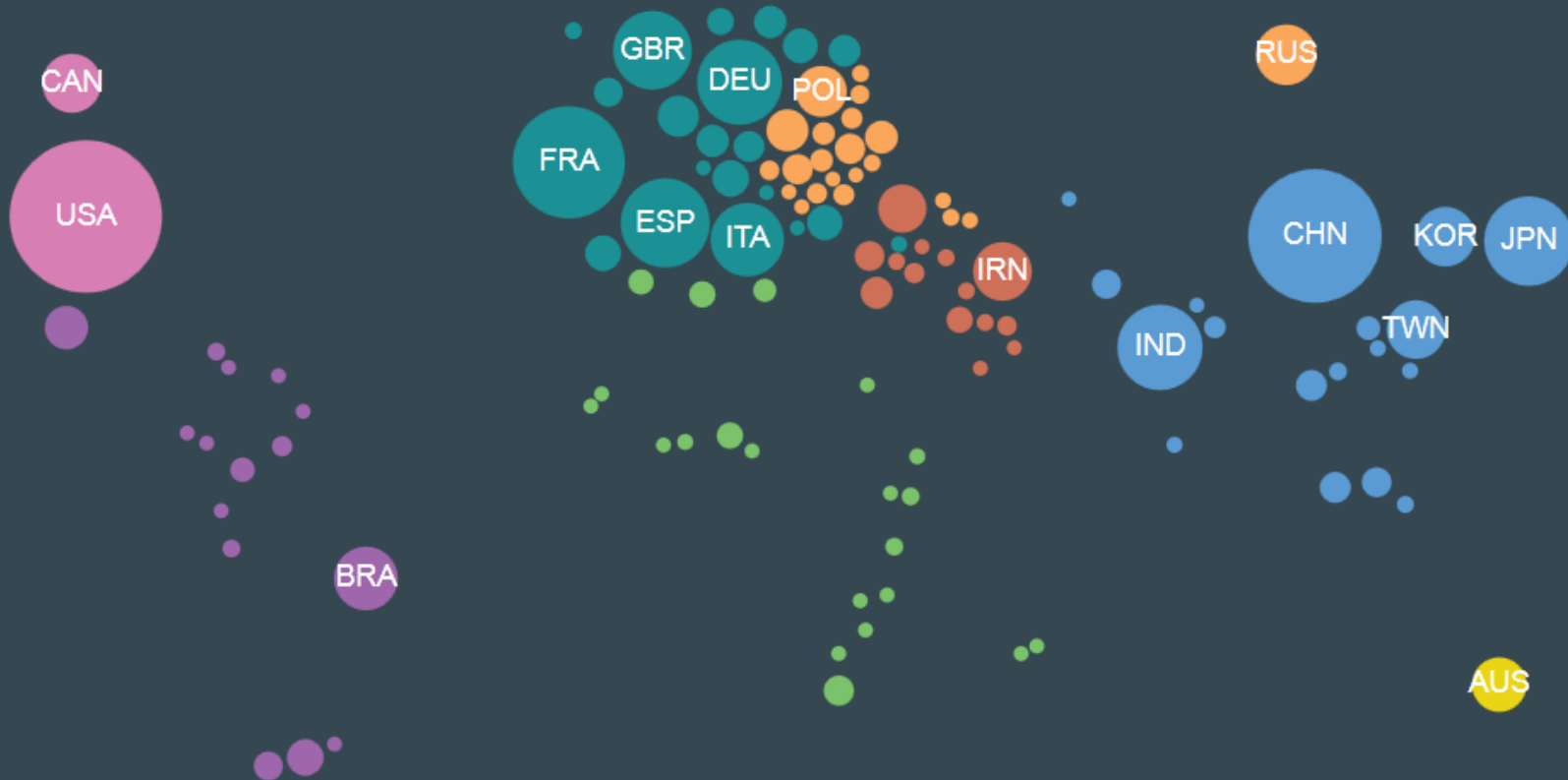
Hans Berger: first human EEG recording in 1924.



SCIMAGO INSTITUTIONS RANKINGS
only ranks, far more than raw data

5100+

ranked institutions



Organizations

➤ Scientific Committees of PAN:

- ✓ Biochemistry & Biophysics
- ✓ Cell Biology
- ✓ Neurobiology



➤ Scientific Societies:

- ✓ Polish Biochemical Society
- ✓ Polish Biophysical Society
- ✓ Polish Cell Biology Society
- ✓ Polish Neuroscience Society
- ✓ Polish Bioinformatics Society

1st Congress
of the Polish
Biochemistry,
Cell Biology,
Biophysics and
Bioinformatics



BIO 2014
Warsaw
9-12 September
2014



PTBF



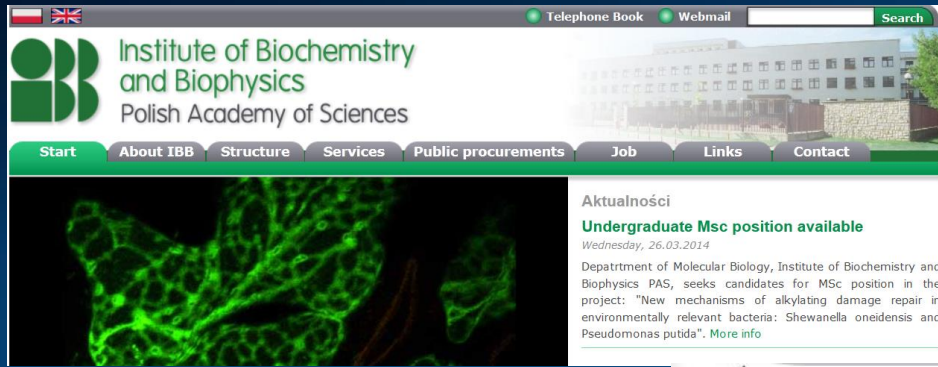
EMBO and Poland



Members of the Polish EMBO community presented their research at the BIO 2014 Congress in Warsaw



Top Research Institutes in Molecular Biology



Institute of Biochemistry and Biophysics
Polish Academy of Sciences

Start About IBB Structure Services Public procurements Job Links Contact

Aktualności
Undergraduate Msc position available
Wednesday, 26.03.2014
Department of Molecular Biology, Institute of Biochemistry and Biophysics PAS, seeks candidates for MSc position in the project: "New mechanisms of alkylating damage repair in environmentally relevant bacteria: Shewanella oneidensis and Pseudomonas putida". More info

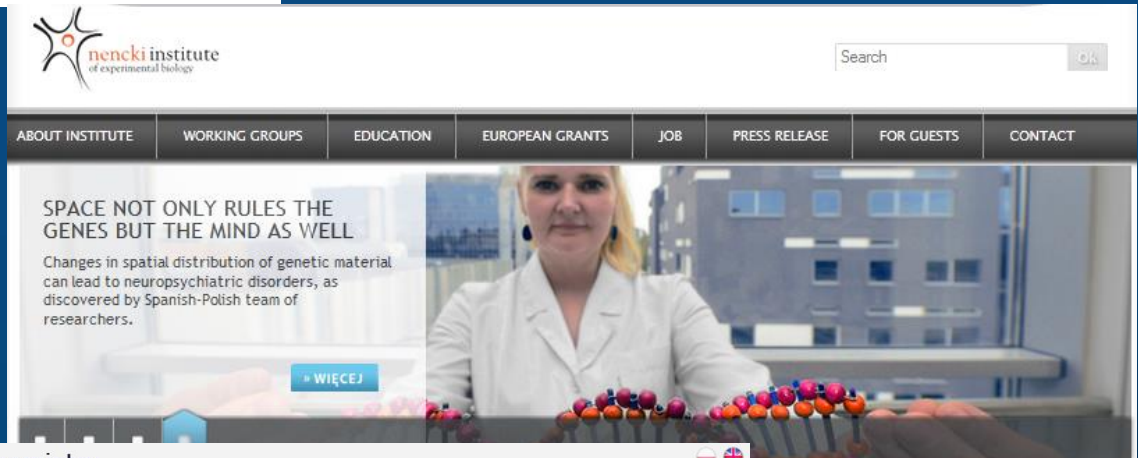


The International Institute of Molecular and Cell Biology

Home Institute Research Equipment/Facilities News Education Jobs Public procurements Biocentrum Ochota Contact

San Francisco DORA

IIMCB signed the San Francisco Declaration on Research Assessment (DORA)
07.11.2014
IIMCB decided to sign the San Francisco Declaration on Research Assessment (DORA), the document created by The American Society for Cell Biology in 2012 containing a



nencki institute
of experimental biology

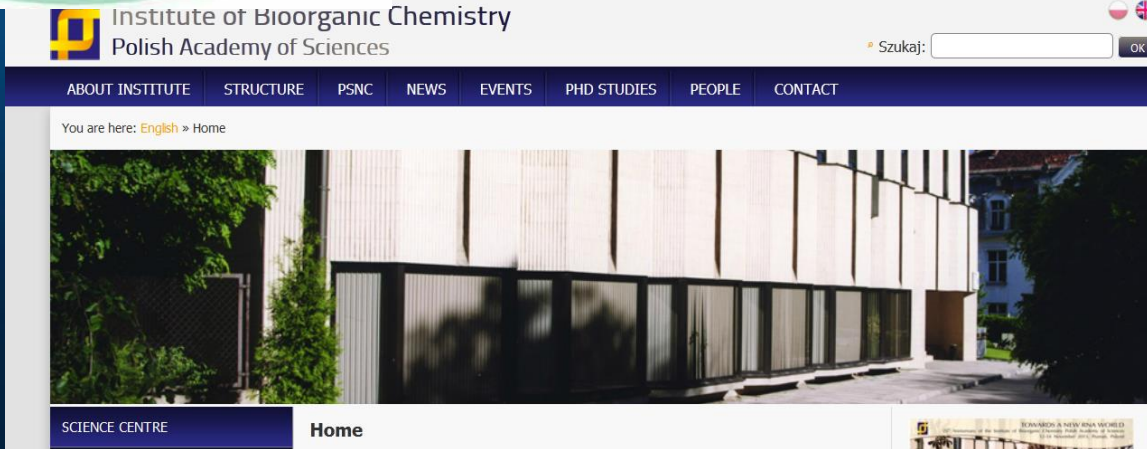
Search OK

ABOUT INSTITUTE WORKING GROUPS EDUCATION EUROPEAN GRANTS JOB PRESS RELEASE FOR GUESTS CONTACT

SPACE NOT ONLY RULES THE GENES BUT THE MIND AS WELL

Changes in spatial distribution of genetic material can lead to neuropsychiatric disorders, as discovered by Spanish-Polish team of researchers.

WIECEJ



Institute of Bioorganic Chemistry
Polish Academy of Sciences

Szukaj: OK

ABOUT INSTITUTE STRUCTURE PSNC NEWS EVENTS PHD STUDIES PEOPLE CONTACT

You are here: English » Home

SCIENCE CENTRE Home

European Molecular Biology Laboratory

Heidelberg



- Basic research in molecular biology
- Administration
- EMBO

- 1500 staff
- 520 at EBI
- >60 nationalities

Hamburg



Structural biology

Hinxton



Bioinformatics

Grenoble



Structural biology

Monterotondo



Mouse biology

Poland applied in 2014, is now a prospect member, on the way to become full member

BRAINCITY: Center of Excellence for Neural Plasticity and Brain Disorders: funded by FNP/IRA for 5 yrs with >9 mln Euro

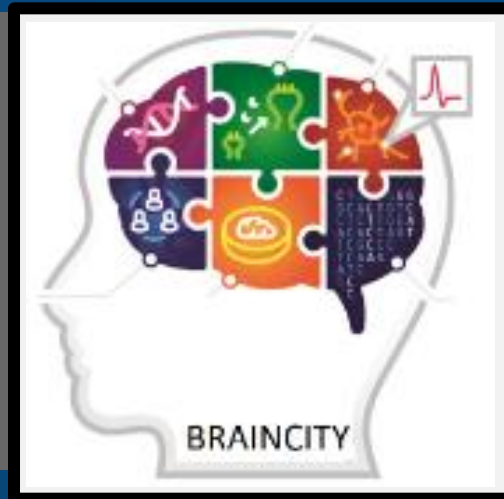


partnership

Inst. Psychiatry
& Neurology

Warsaw Medical
University

Children's Memorial
Health



Research
Innovation
Therapy

CELON PHARMA

ONCOARENDI

6 group leaders, 12 postdocs, 12 PhD students

International projects

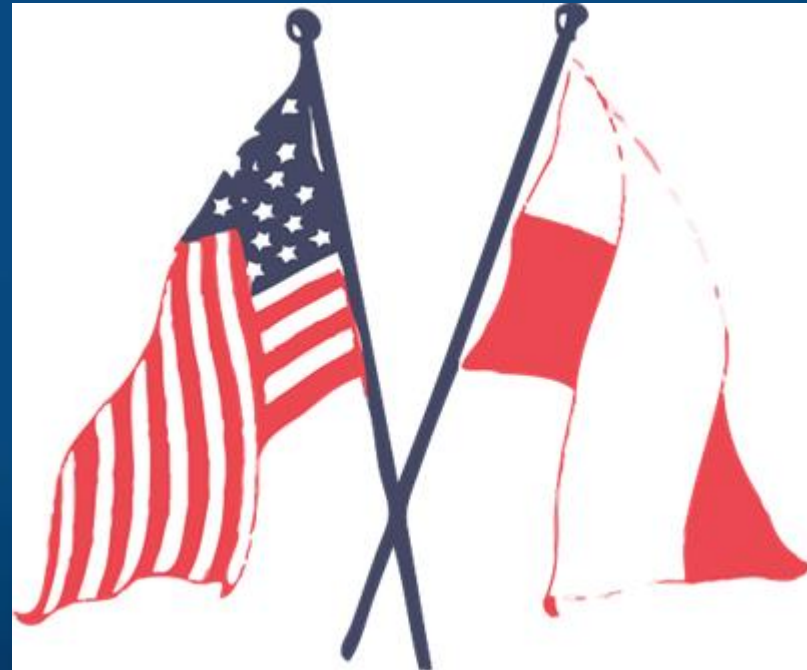
Participation in pan-European ESFRI projects (European Strategy Forum on Research Infrastructures).

- ELIXIR (European life-sciences Infrastructure for biological Information).
- NEBI, part of Euro-BioImaging, European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences, ESFRI.
- POL-OPENSOURCE, part of EU-OPENSOURCE, Open Screening Platforms.
- SeCuRe, part of MIRRI (Microbial Resource Research Infrastructure).
- BBMRI (*Biobanking and Biomolecular Resources Research Infrastructure*).
- Participation in the 130 COST actions in Biomedicine and Molecular Biosciences; Food and Agriculture; Forests, their Products and Service; Chemistry and Molecular Sciences and Technologies; Earth System Science and Environmental Management.

Ministry of Science and Higher Education supports over 250 research units doing life science research, in recent years has made a lot of infrastructure investments and gives stipends for students/young researchers.

PL-USA Current Collaboration

- 1994, PL-US-Innovation Council agreement signed in Los Angeles.
- 37 Polish universities linked with 105 U.S. partners
- 350+ U.S. firms in Poland
- \$20-40 billion in American investment in Poland
- 1 B\$ funds for cooperation
key sectors include: Health, Science & Technology, Energy





Biobanking



- European Biobank Forum, a platform for information exchange between countries with advanced population-based cohorts.
- Pan-European **Biobanking and Biomolecular Resources Research Infrastructure** (BBMRI).
- **Poland** has been a full Member of BBMRI since autumn 2016.
- The Polish Biobanking Network, BBMRI.pl
- **Polish Brain Bank**, and **Digital Brain Project**, in development by the Institute of Psychiatry and Neurology in Warsaw.



Neuro Informatics 2019

Polish Node of the International Neuroinformatics Coordination Facility, established in Warsaw at Nencki Institute, now at the Nicolaus Copernicus University in Toruń.

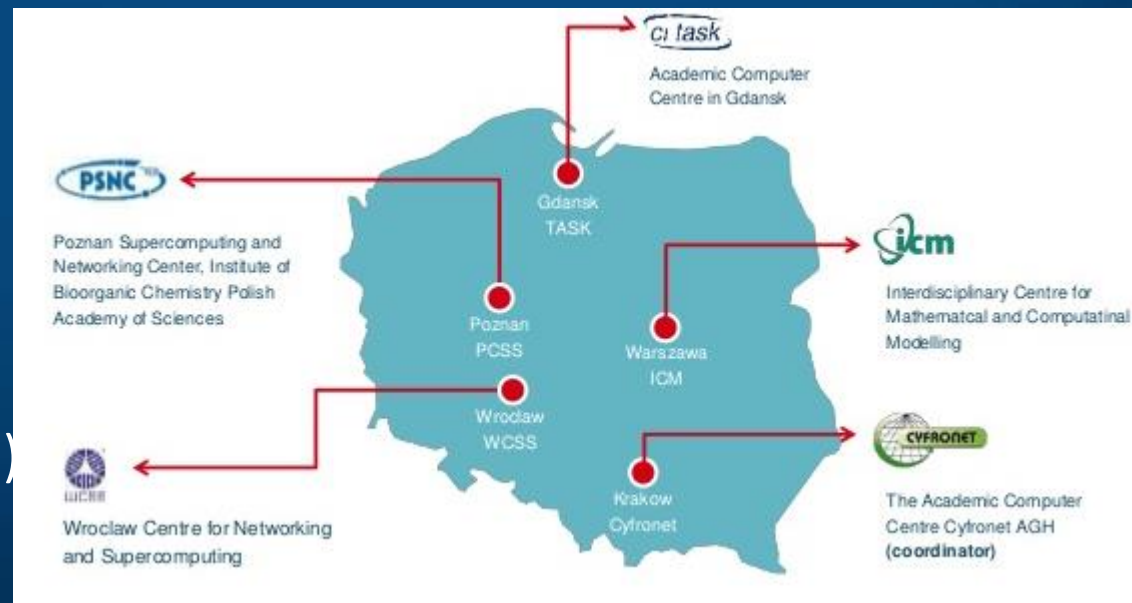
31.08–02.09: 12th INCF Congress on Neuroinformatics and INCF Assembly, Warsaw 2019.

<http://www.neuroinformatics2019.org/>

Neuroimaging, computational neuroscience, artificial intelligence.
We hope to become a full member of INCF by that time.

PL-Grid HPC Infrastructure

- The Polish Grid Infrastructure (NGI) connects 5 supercomputing centers, enabling research in various domains of e-Science.
- This infrastructure supports scientific investigations by integrating experimental data and results of advanced computer simulations carried out by geographically distributed research teams.
- A part of a pan-European infrastructure built in the framework of the EGI (European Grid Initiative).
- INCF-PL is working on national neuroscience gateway.
- Collaboration with HBP medical platform (prof. R. Frackowiak and prof. P. Bogorodzki)



Brain Plan for Poland

The Brain Plan for Poland, started in 2014.

Final strategic document will be published in Dec. 2018, including legal and financial solutions, proposals for the implementation, integration of various societies related to brain research and medical aspects of brain disease.

Focus on brain diseases, medical services, research. Key points:

Development of strategic objectives

Identification of changes in the organizations and financing

Indication of suggested amendments to legal regulations

Precise identification of changes in the valuation

Presentation of models of regulations

Expected benefits

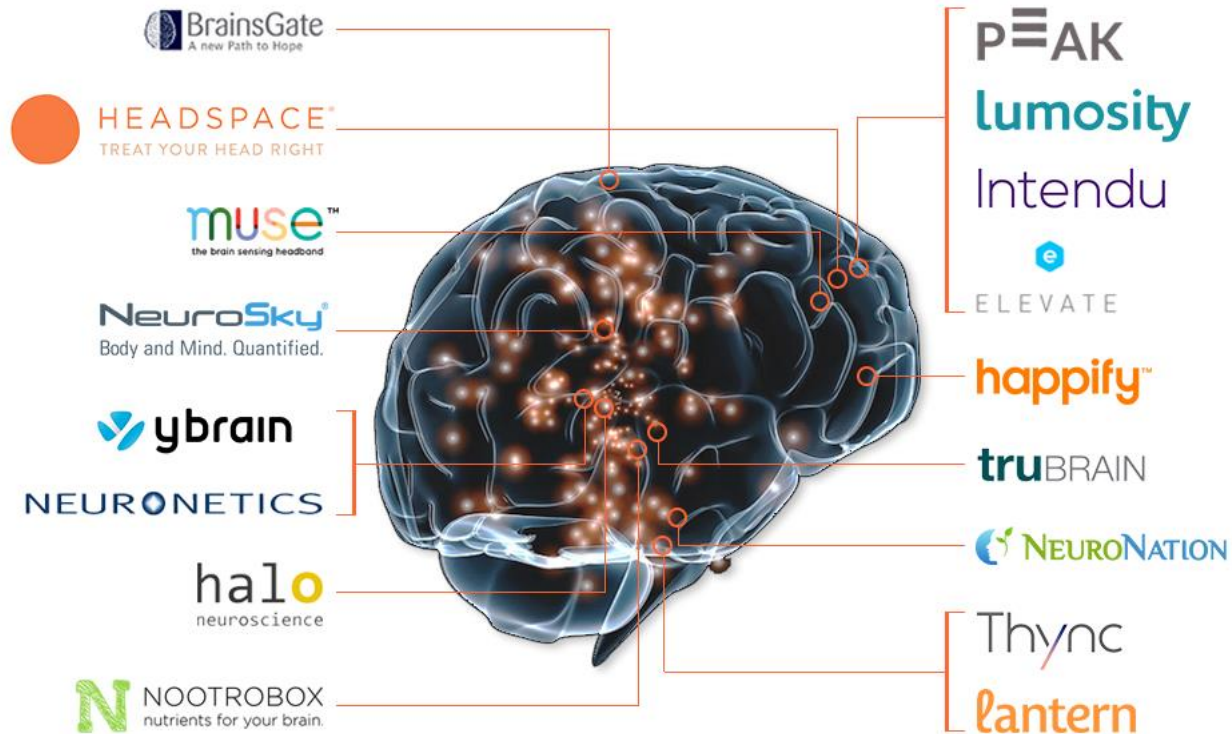
- Neuroimaging, EEG/MEG for stratification of various subtypes of mental disorders, including organic problems, ASD, schizophrenia, epilepsy, learning disabilities, depression, anhedonia.
There is some hope that these disease may be clustered into several subtypes based on brain connectivity and functional large scale networks activity, diagnosed and treated in more precise way.
- Enabling early ASD diagnosis and other developmental problems.
- Nonpharmacological approaches to various forms of pain management through neuromodulation; distinguishing between organic, chronic, psychogenic and faking pain.
- Treatment of drug addiction – this is one of the goals of BRAINCITY project, searching for molecular mechanisms responsible for addiction.
- Monitoring development of children and infants.

More benefits

- Novel more effective ways of neurofeedback for attention deficits.
- Closed loop neurofeedback for neurorehabilitation: discovering deficits in information flow in the brain, targeting neuroplasticity in specific brain areas to form new functional connections.
- Improvement in brain-computer interfaces, new applications of BCI in information retrieval and situation awareness.
- Disorders of consciousness – communication and better diagnosis.
- Applications in education: testing for problems such as dyslexia or dyscalculia, lack of musical imagery, objective assessment of learning outcomes and individual learning differences.
- Memory improvement.
- Neurocognitive technologies for optimization of brain processes.

Startups around the world

BOOSTING THE BRAIN: 17 Startups to Watch



NeuroLab – Global Program



NeuroLab Program

The **NeuroLab Program** provides researchers in Africa, Asia and Latin America with equipment, tutorials and tools to quickly add human EEG to their research.

Researchers can be operating in any adjacent fields such as medicine, sociology or public health and no prior neuroscience expertise is required.

APPLY NOW

India

Argentina

Brazil

Sudan

Rwanda

Vietnam

Tara Thiagarajan, Founder and Chief Scientist, Sapiens Lab: <https://sapienlabs.co/>
A Collaborative platform for the Human Neuroscience <https://brainbase.io>
EEG data from all around the world.