



Logo

# Launch of CCC ( China-Canada-Cuba ) International Brain Corporation Project

The Goal: Brain aging study based on cloud platform

CCC project was initiated and promoted by scientists from three agencies



Representatives from three agencies signed the corporation agreement in May, 2016

Research Vice President of McGill University, Canada  
Director of Cuban Neuro Science Center, Cuba  
Dean of School of Life Science and Technology, UESTC, China



MEMORANDUM OF UNDERSTANDING  
BETWEEN THE  
ROYAL INSTITUTION FOR THE ADVANCEMENT OF LEARNING /  
McGILL UNIVERSITY  
AND  
CENTRO DE NEUROCIENCIAS DE CUBA  
AND  
UNIVERSITY OF ELECTRONIC SCIENCE AND TECHNOLOGY OF CHINA

Name: Dr. Rose Goldstein	Name: Mitchell Valdés-Sosa, PhD.
Title: Vices-Principal (Research and International Relations)	Title: General Director
Institution: Royal Institution for the Advancement of Learning / McGill University	Institution: Neuroscience Center of Cuba
Signature: <i>Rose Goldstein</i>	Signature: <i>Mitchell Valdes</i>
Date: 20 May 2016	Date: 20 June 2016
Name: Prof. Dezhong Yao	
Title: Dean, School of Life Science and Technology	
Institution: University of Electronic Science and Technology of China (UESTC)	
Signature: <i>Dezhong Yao</i>	
Date: 25 May 2016	

China: Yao Dezhong, AIMBE fellow, The Yangtze River Scholar, Distinguished Young Scholar(NSFC), UESTC

Canada: Alan Evans, Academician of Royal Society of Canada, Chairman of International Brain Imaging, International Highly Cited Scientists

Cuba: Mitchell A. Valdes Sosa, Academician of Cuba Academy of Science, Cuban Neuroscience Center  
Pedro: the general coordinator of the three parts. Pedro is “One Thousand Talents” professor at UESTC, and Academician of Cuba Academy of Science at Cuban Neuroscience Center

# Launch of CCC ( China-Canada-Cuba ) International Brain Corporation Program

## Supports from Mcgill and UESTC

President Suzanne Fortier of McGill University wrote to President Li Yanrong of UESTC on Aug, 24<sup>th</sup>, 2016, showing support to the CCC project. On the same day, President Li Yanrong replied to give full support to the project. On 1<sup>st</sup> of November, 2016, President Suzanne Fortier wrote back to President Li Yanrong to express the support to CCC project again.

Li Yanrong, PhD,  
President of UESTC  
Distinguished professor of School of  
Electronics  
Email: [yrli@uestc.edu.cn](mailto:yrli@uestc.edu.cn)

Dear President Li,



Suzanne Fortier, PhD, FRSC  
Principal, McGill University

Dear Principal Fortier,

尊敬的 Fortier 校长

As President of the University of Electronic Science and Technology of China (UESTC), I am very pleased to receive your letter proposing greater collaboration in Neuroinformatics, with the concrete idea of a China-Canada-Cuba (CCC) axis. We fully support this initiative. This is indeed an advance from the MOU that we have recently signed with your organization as well as with the Cuban Neuroscience Center.

作为电子科技大学的校长，收到您的来信我倍感荣幸，也非常赞成您在信中提及的形成加拿大-古巴-中国（CCC）在神经信息科学领域的合作轴。我们将全力支持该提议。毫无疑问，这也是我校与贵校以及古巴神经科学研究中心对已签订的CCC备忘录的一次实质性推进。

Aug.26,2016

McGill

Office of the Principal and Vice-Chancellor  
Bureau de la principale et vice-chancelière

Suzanne Fortier, PhD  
Principal and Vice-Chancellor  
Principale et vice-chancelière  
Professor of Chemistry  
Professeure de chimie

October 28, 2016

Li Yanrong,  
President of UESTC,  
School of Electronics,  
UESTC,  
Chengdu, China

Dear P

I write to you on behalf of the University of Electronic Science and Technology of China (UESTC) in response to your letter of August 24, 2016, regarding the proposed greater collaboration in Neuroinformatics, with the concrete idea of a China-Canada-Cuba (CCC) axis. We fully support this initiative. This is indeed an advance from the MOU that we have recently signed with your organization as well as with the Cuban Neuroscience Center.



Li Yanrong,  
President of UESTC,  
School of Electronics,

I write to you on behalf of the University of Electronic Science and Technology of China (UESTC) in response to your letter of August 24, 2016, regarding the proposed greater collaboration in Neuroinformatics, with the concrete idea of a China-Canada-Cuba (CCC) axis. We fully support this initiative. This is indeed an advance from the MOU that we have recently signed with your organization as well as with the Cuban Neuroscience Center.

# Chinese Premier Li Keqiang visited McGill University on 16th, Sep, 2016

## Supports from the three Countries



Chinese Premier Li Keqiang, centre, and Quebec Premier Philippe Couillard, rear, look at an exhibit dedicated to Dr. Normand Bethune on Friday in Montreal. PAUL CHIASSON/THE CANADIAN PRESS

McGill University gave a special explanation to CCC project among the introductions of other corporations



### Overview of McGill-China Relations 2015-16



McG

#### Research Cooperation

McGill has 17 Memoranda of Understanding (MOUs) with institutions in China:

- 1. Beida Jade Universal Fire Alarm Device Co.
- 2. Beihang University
- 3. Beijing Institute for Brain Disorders / Capital Medical University
- 4. Beijing University of Posts and Telecommunications
- 5. China Scholarship Council
- 6. Fudan University, School of Medicine
- 7. Harbin Institute of Technology
- 8. Nanjing Medical University
- 9. Peking University
- 10. Qingdao University, School of Medicine
- 11. Shanghai Jiao Tong University, School of Medicine
- 12. Southwest University for Nationalities
- 13. Tsinghua University
- 14. University of Electronic Science and Technology of China (UESTC) – tripartite agreement with Cuban Neuroscience Center (*see box below*)
- 15. Xiamen University
- 16. Yunnan Minzu University
- 17. Zhejiang University

In addition to these MOUs, McGill researchers are actively collaborating with China in areas such as *Medicine, Ophthalmology, Human Genetics, Epidemiology and Biostatistics, Neurology and Neurosurgery, Biochemistry, Biology, Physics, Bioresource Engineering, Health and Computer Engineering, Health and Social Policy, East Asian Studies, and Political Science* among others. McGill researchers are currently involved in **41 sponsored research projects** where China is a partner country, with funding of **\$11 million** (Aug 2016).

A tripartite cooperation agreement in *Neuroinformatics* was recently signed between McGill's Montreal Neurological Institute (MNI), the Cuban Neuroscience Center (CNeuro), and the University of Electronic Science and Technology in China (UESTC).

The *China-Canada-Cuba (CCC) Axis* brings together three countries with complementary strengths in brain research and its translation into clinical practice. Built upon a common IT infrastructure (CBRAIN), the CCC Axis facilitates sharing multi-domain data (imaging, genetics, behaviour, clinical etc.) and analytic capabilities. Trainees and scientists travel between the three countries to foster collaborative projects in brain research that hold substantial promise for clinical impact, exploring novel strategies for healthy brain development and treatment of brain disorders. The MNI's research in this area will be further boosted by its recent success in the Canada First Excellence Research Fund competition, awarding **\$84M** to McGill's Healthy Brains for Healthy Lives program to build on the University's leading position and its partnerships in neuroscience to make McGill a global hub for brain research – one of the major frontiers for 21st-century medicine.

# Launch of CCC ( China-Canada-Cuba ) International Brain Corporation Project

## Supports from the three Countries

In Sep, 2016, during the Premier Li Keqiang's visit to Cuba, The CCC project agreement got upgraded to the agreement between chengdu government and the government of Cuba.



**Li Keqiang, Raul Castro witnessed the sign of the agreement between Chengdu and Cuba**



成都市人民政府与古巴生物技术和医药产业集团关于启动中国(成都)-加拿大-古巴脑计划的战略合作框架协议

本协议由双方签署,旨在进一步促进双边合作与投资,是继2015年10月成都市市长唐良智访问古巴后进一步促进双边关系的举措。

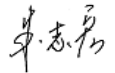
甲 方:成都市人民政府  
地 址:中国四川省成都市锦悦西路2号


乙 方:古巴生物技术和医药产业集团  
地 址:古巴哈瓦那博罗斯阿维尼达独立街100号大街3126号

目标  
本协议旨在推动双边合作打造中国(成都)-加拿大-古巴脑计划(CCC-脑计划)。

电子科技大学(UESTC)教育部神经信息重点实验室(FILNI)与中国-古巴神经科技转化前沿研究联合实验室,(由电子科技大学和古巴神经科学中心联合成立)(JCCL)在联系两国主要国际脑计划及世界卫生组织方面具有优势地位。

本合同由双方授权代表在2016年9月1日代表各方签署订立,特此为证。本协议签署于古巴哈瓦那,一式两份,本协议以中英文书写。两种版本如有冲突,以英文为准。

  
甲 方:成都市人民政府  
法定代表人:朱志宏,成都市人民政府常务副市长

  
乙 方:古巴生物技术和医药产业集团  
法定代表人:卡洛斯·古铁雷斯,古巴生物技术和医药产业集团总裁

日 期:  
地 点:古巴哈瓦那

**Raul Castro and Quebec governor Philippe Couillard witnessed the corporation agreement between Cuba and Canada**

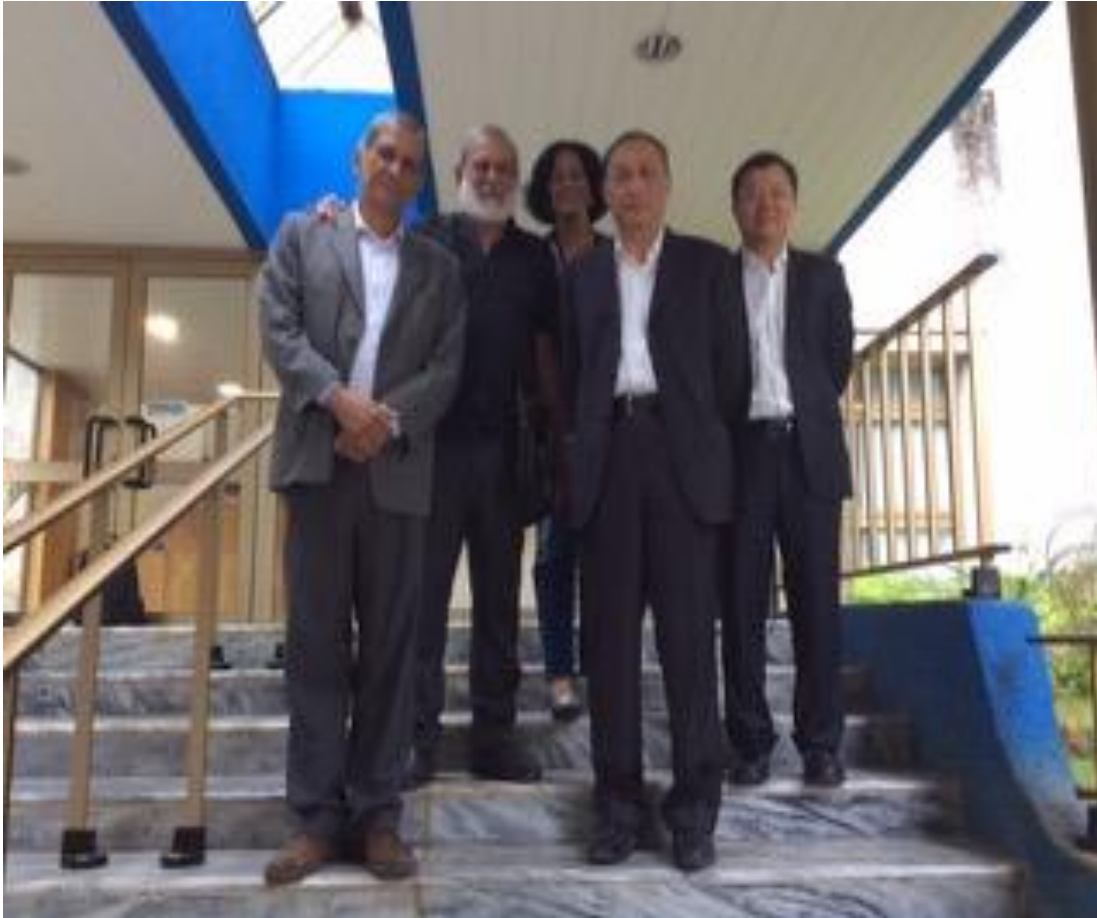
## Government officials visited Cuba after the sign of CCC project agreement

### Supports from Chengdu City



Tang Liangzhi, Party secretary of Chengdu, visited Cuban Neuroscience Center (2016)

Officials from National **Natural Science Foundation of China (NSFC)** expressed their support



**Yang Wei, Chairman of NSFC, and Feng Feng, Director of Bureau of International Corporation, visited Cuban Neuroscience Center. (2016)**

# National Natural Science Foundation of China (NSFC) gives financial support to CCC project



**Granma**  
MIÉRCOLES 1  
Marzo del 2017  
Año 59 de la Revolución  
No. 50 • Año 53 • Cierre 11:00 P.M.  
Edición Única • La Habana  
Precio 20 ¢

ÓRGANO OFICIAL DEL COMITÉ CENTRAL DEL PARTIDO COMUNISTA DE CUBA

HOME CUBA WORLD SPORTS CULTURE TOURISM

## New brain mapping project

Cuba, China, and Canada will work together on a new brain mapping project

Author: Orfilio Peláez | orfilio@granma.cu  
march 1, 2017 12:03:35

It was agreed that Cuba, China, and Canada will work together on a new joint brain mapping project, after a recent meeting on the subject held at Cuba's Neurosciences Center (Cneuro). According to Pedro Valdés Sosa PhD, coordinator of the Cuban Brain Mapping Project, launched over 10 years ago, the three countries

NSFC of China、Cuban Ministry of Science and Technology、Canadian foundation at Cuba in **Feb, 2017** to discuss potential corporations.

The above three agencies agree to financially support one project in Jun, 2017

Yao Dezhong, Alan, Pedro will be responsible for this project.



## scientists from each of CCC gathered together at McGill (2017)

In **June, 2017**, delegations of UESTC and Cuban Neuroscience Center visited Montreal Neurological Institute and hospitals, and communicate with CCC-axis chief scientist Alan Evans and his teams about the recent achievement of brain neuroscience study.



Group photo in front of **the CCC-axis lab of McGill university**, Canada professor Alan Evans (second right) , professor Pedro (forth right) , professor Yao Dezhong(fifth left) are initiators of CCC-axis.

# CCC is deemed by Canadian Open Neuroscience Platform(CONP) (2017) as the second most important international corporation partners(JHU Neurodata, CCC, European HBP...)

Brain Canada Platform Support Grant Competition, May, 2017.  
**Canadian Open Neuroscience Platform.**  
Group Leader: Alan C. Evans, Ph.D.

**Project Title:** Canadian Open Neuroscien

**GROUP LEADER:** Alan C. Evans, PhD

Montreal Neurological Institute

McGill University

3801 University Street,

Montreal, QC, H3A 2B4

Phone: 514-398-8926

e-mail: alan.evans@mcgill.ca

**START/END DATES:** Sep 1, 2017 – Aug

**AMOUNT REQUESTED:** \$1,000,000

**KEY WORDS:** Open Science  
Behaviour, High-Performan  
Security, Patient Privacy

## **PLATFORM SUMMARY**

We propose to create a n  
data, the Canadian Open N  
many of the country's leadi  
interactive network of collab  
international partnership, cli  
built upon a mature national  
computing (HPC) and cloud

Brain Canada Platform Support Grant Competition, May, 2017.

**Canadian Open Neuroscience Platform.**

Group Leader: Alan C. Evans, Ph.D.

a PhD in the *Evans* lab, working on the expansion of CBRAIN cloud services and open data-sharing. He will be a key driver in the harmonization of CONP with the US network.

**China-Canada-Cuba (CCC)-Axis (Yao, Evans, Valdes-Sosa):** The CCC-Axis will align brain mapping programs in China, Canada and Cuba. While there is a rich, 20-year history of collaboration between the country leads (e.g. LABMAN network, Uludag et al., 2009), the CCC-Axis adds a more formal level of infrastructural and organizational integration, with a broader vision of cross training, data/code-sharing and joint projects. Following an inaugural meeting in Havana in February, 2017, the CCC-Axis was launched with the help of three funding agencies (NSFC in China, FQRNT in Québec, CITMA in Cuba). Each country will contribute an initial \$100K p.a. for three years to (i)

**AIM 6: International partnership:** CONP international partners include (see letters):

We have identified a set of strategic international partnerships that build CONP's global reach, in the US, the UK, China, Europe and Latin America.

**NeuroData at Johns Hopkins University (Vogelstein):** We have developed Web services for visualization and exploration of large 3D datasets, such as the 1 Terabyte BigBrain atlas (Amunts et al., 2013) at the MNI. While real-time 3D image exploration is in place, there is much work to be done on the creation of a smooth and intuitive user interface for CONP researchers. Further, we will explore the integration of external big data visualization tools, such the 'ndstore' tool from Joshua Vogelstein's NeuroData group at Johns Hopkins U. A CONP plugin will integrate NeuroData's spatial database, ndstore, which can store and serve tera-scale image volumes across multiple resolutions. This spatial database stores images as cuboids which can be delivered efficiently to the user, and greatly simplifies the burden of performing parallel analyses on big data volumes. This plugin will enable CONP to handle significantly larger imaging data volumes, ranging from MRI to X-ray Microscopy and EM (Burns et al. 2013, 2014) by supplying a common back-end to which CONP provides access. This plugin will therefore offer the same interface to users, regardless of how their data is stored in the back-end. Beyond the particular interest in remote 3D visualization of big datasets, there are strong reasons to foster the links between CONP and the NeuroData group since they are leading the US movement towards an international neuroscience data-sharing network (Vogelstein et al., 2016). A core member of the NeuroData team, Greg Kiar, has started

IS platforms, and (ii) launch of Electronic Science and rise in statistical modeling of eering/computing trainees. analysis groups at the Cuban at CNEURO in Havana and and the CCC-Axis therefore eir skillset in other countries.

uropean initiative to simulate munts collaborates with

# CCC is fully involved in Cloud Brain Project Global brain project collaboration group ( 2017.6 JHU ) NeuroStorm: Accelerating Brain Science Discovery in the Cloud

CCC (Chengdu of China, McGill University, Cuban Neuroscience center) joined the international discussion of data to be stored in the cloud, open shared data management-exploration-analysis tools. Data (data collection and data preparation) and tools (analysis and modeling) are the kernel.

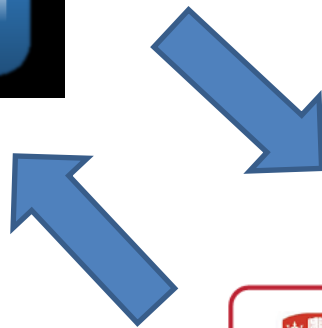
Table 1: List of commitments that participants of NeuroStorm made towards accelerating brain science discovery in the cloud. **ToDo:** add/revise your brief commitment statement.

Team	Commitment
KMH, EP, JTV, RB	Pre-registration and immediate release of new dataset at TACC and through NeuroData
QW, PVS	Survey of Latin American countries towards understanding the barriers of neuroscience
TG, KJG, GK, ACE	Integration of BIDS and BIDS Apps, by way of Boutiques, with CBRAIN
QW, TG, RB, PVS	Deployment of CBRAIN onto Chinese HPC environments including Baidu
AB, KJG	Extension of the BIDS format for small-animal models and creation of a corresponding app
GK, DK, ACE	Ingestion of BigBrain dataset into the Boss spatial database
SWE	Creation of high-quality <i>C. Elegans</i> connectomics website
CEP, JP, HP	Demonstration of exploratory data analysis on a massive connectome
FTS, ALY, CE, KA	Planning of workshop on neuromodelling to take place in Paris
DJT, MIM	Creation of BIDS app from a neuromorphometry pipeline
ZI, CC	Pooling of EEG pre-processing methods and data sharing mechanisms
BF, EP, JTV, WGR	Deployment of open neuroscience Boss
EWB, GK, JTV	Creation of BIDS app from functional connectome estimation pipeline
SM, EP	Collection and sharing of whole mouse-brain 20-nanometer EM images
PQ, EP, JTV	Packaging of pipelines and data tools for cleared brains in the cloud
RJV	Make a financial plan for data sustainability

- UESTC will be responsible to configure CBRAIN at the Baidu Cloud in China, and also work together with Cuban scientists to integrate neuroscience study in Latin America.

## Working Progress

Electrophysiological signal oriented cloud platform was announced at  
Jan 20, 2018 Webrain.uestc.edu.cn



<http://mcin-cnim.ca/technology/cbrain/>

MRI focused cloud platform

# Grants for Chinese Side:

1. NSFC ( Yao, Pedro, He), 2018-2020
2. Fund of State Foreign affairs ( M L Bringsa-Vega, Pedro),2018-2020
3. Fund of MOE (Yao, Dong) ,2018-2020
4. Fund of Sichuan Province ( Yao, Li and Dong), 2017-2019
5. Fund of MOST ( Yao, Liu), 2018-2019