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PLAN MALADIES NEURO-DÉGÉNÉRATIVES 2014 | 2019

CALL FOR PROPOSALS / APPEL À PROPOSITIONS

« IDENTIFICATION OF CENTERS OF EXCELLENCE IN THE FIELD OF NEURODEGENERATIVE DISORDERS »

«IDENTIFICATION DES CENTRES D'EXCELLENCE DANS LE DOMAINE DES MALADIES NEURODEGENERATIVES »

Application file/ Dossier de candidature

Submission should be received before May 27, 2015, at 12 noon, Paris time.
The full application file must be emailed at the following address:

Les dossiers doivent être reçus avant le 27 mai 2015, à midi, heure de Paris.
Le dossier de candidature complet doit être envoyé à l'adresse mail suivante :

marie-louise.kemel@aviesan.fr

Title of the center: Titre du centre:

"BIND"
Bordeaux Initiative for Neurodegenerative Disorders

Keys words / Mots clés (5):

-Trans-disciplinary initiative
-Core of Excellence
-Patient-driven
-Population-centred
-Single geographical location

Name of the coordinator of the center / Nom du coordonnateur:

Professor François Tison, MD, PhD

Institution in charge of the center / Tutelle responsable du centre:

Bordeaux University (BU)

List of the teams included in the center with name of the team leader / Liste des équipes incluses dans le centre avec le nom du directeur

A brief description of the teams can be found on « BIND » *website.*

A. University Hospital of Bordeaux (CHU-B).

Center of Clinical Neurosciences (Pôle des Neurosciences Cliniques). Dr. F. Rouanet, MD.

- Department of Neurology - Prof. B. Brochet, MD, PhD, Prof. of Neurology, ***President of the French Federation of Neurology-FFN.***

- Institute of Neurodegenerative Diseases Clinical Branch (IMNc) - Prof. F. Tison, MD PhD, Prof. of Neurology, Adjunct Director of the Institute of Neurodegenerative Diseases (IMN), UMR CNRS-Bordeaux University 5293.
  *Regional Expert center for Parkinson's disease (PD) - Prof. W. Meissner, MD PhD, Prof. of Neurology, UMR CNRS-Bordeaux University 5293.
  *Memory-Alzheimer's disease (AD) Clinic (CMRR) - Prof. F. Tison , MD PhD, Prof. of Neurology, UMR CNRS-Bordeaux University 5293.
  *Deep Brain Stimulation and Clinical Neurophysiology - Prof. P. Burbaud, MD PhD, Prof. of Neurophysiology, UMR CNRS-Bordeaux University 5293.
- Multiple Sclerosis (MS) Clinic - Prof. B. Brochet, MD PhD, Prof. of Neurology, UMR INSERM-Bordeaux University 862.
- Rare disease national reference center for Multiple System Atrophy (MSA) - Prof. W. Meissner, MD PhD, Prof. of Neurology, UMR CNRS-Bordeaux University 5293.
- Reference Center for Amyotrophic Lateral Sclerosis (ALS) - Prof. G. Le Masson, MD PhD, Prof. of Neurology, *member of the regional ethic committee*, UMR INSERM-Bordeaux University 862.

- **Department of Physical Medicine and re-Adaptation** - Prof. P. Dehail, MD, PhD, HCAS - EA 4136, Bordeaux University.

Center of Clinical Gerontology (Pôle de Gérontologie Clinique) - Prof. N. Salles, MD PhD, Prof. of Gerontology, UMR INSERM-Bordeaux University 853.

- Telemedicine Group for the management of demented patients with disruptive neuropsychiatric symptoms in nursing homes - Prof. N. Salles, MD PhD, Prof. of Gerontology, UMR INSERM-Bordeaux University 853.
- Physical activity intervention in older patients - Prof. I. Bourdel-Marchasson, MD PhD, Prof. of Gerontology, RMSB UMR CNRS-Bordeaux University 5536.
- Memory Clinic (CM) – Dr. S. Richard-Harston, MD, Bordeaux University.

Department of Medical Genetics - Prof. D. Lacombe, MD PhD, Prof. of Medical Genetics, MRGM - EA-Bordeaux University 4576.

- Neurogenetic Clinic - Prof. C. Goizet, MD PhD, Prof. of Medical Genetics, MRGM - EA-Bordeaux University 4576.
- Rare disease national reference center for Mitochondrial Disorders - Prof. D Lacombe, MD PhD, Prof. of Genetics, MRGM- EA-Bordeaux University 4576.
- National expert center for Huntington Disease (HD), Neurogenetic Disorders and Metabolic Disorders - Prof. C. Goizet, MD PhD, Prof. of Medical Genetics, MRGM - EA-Bordeaux University 4576.

Center for Clinical Investigation (CIC) - Plurithematic (CIC-P, INSERM, CHU-B, Bergonié Institute "Centre de Lutte Contre le Cancer", Bordeaux University).- Prof. N. Moore, MD, PhD, Prof. of Pharmacology, Head of CIC. Prof. P. Philip, MD PhD, Prof. of Physiology, CIC-P-Neurosciences Branch ***Medical Coordinator of the Clinical Research and Innovation Direction at the CHU-B.***

Diagnostic and Therapeutic Neuroimaging Unit - Prof. V. Dousset, MD PhD, Prof. of Radiology, Director of the Laboratory of Excellence TRAIL (LabEx TRAIL) ***Vice-President of Bordeaux University****, Department of International Affairs*.

B. Bordeaux University (BU).

B.1. Multi Label Research Units (Unités Mixtes de Recherche -UMR).

B.1.1 With CNRS (National Center for Scientific Research), CEA (French Atomic Energy and Alternative Energies Commission, Bordeaux University) and INRIA (National Research Institute in Computer Science and Automation).

Institute of Neurodegenerative diseases (IMN) – UMR CNRS-Bordeaux University 5293 – Dr. E. Bézard, PhD, INSERM Research Director, ***Adjunct Coordinator of "BIND".***

- Team "Pathophysiology of Parkinsonian syndromes"- Dr. E. Bézard, PhD, INSERM Research Director.
- Team "Neuro-Functional Imaging Group (GIN)" – *Currently UMR5296 CNRS, Bordeaux University and CEA* - Prof. B. Mazoyer, MD PhD, Prof. of Radiology and Medical Imaging.
- Team "Physiology and physiopathology of executive functions" - Prof. P. Burbaud, MD PhD, Prof. of Physiology / Dr. Th. Boraud, MD, PhD, CNRS Research Director.
- Team "Dopamine and neuronal assemblies" - Dr. J. Baufreton, PhD, CNRS Researcher / Dr. F. Georges, PhD, CNRS Researcher.
- Team "Dynamics of neuronal and vascular networks during memory processing" - Dr. B. Bontempi, PhD, CNRS Research Director.
- Team "Biochemistry, DBS and Parkinson" - Prof. P. De Deurwaerdere, PhD, Prof. of Neuroscience / Dr. A. Benazzouz, PhD, INSERM Research Director.
- Team "Mnemonic Synergy"- Dr. F. Alexandre, PhD, INRIA Research Director.

B.1.2. With CNRS (National Center for Scientific Research) only

Institute for Cognitive and Integrative Neuroscience Aquitaine (INCIA) - UMR CNRS-Bordeaux University 5287- Dr. J.R. Cazalets, PhD, CNRS Research Director.

- Team "Development of spinal networks in normal and pathological conditions" - Prof. P Branchereau, PhD, Prof. of Neurosciences, Bordeaux University.
- Team "Interactions between emotions and memory systems: from normal to pathological aging" - Dr. D. Beracochea, PhD, CNRS Research Director.
- Team "Neuroimagery and human cognition" - Prof. I. Sibon, MD PhD, Prof. of Neurology / Dr. J. Swendssen, PhD, CNRS Research Director.
- Team "Molecular Imaging of Brain (MIB)" - Dr. J. Badaut, PhD, CNRS Researcher / Dr. P. Zanotti-Fregonara, MD-PhD, Nuclear Medicine, University of Bordeaux.
- Team "Neurobiology of behavior"- Dr. Y. Cho, PhD, Associate Professor of Neuroscience / Dr. W. Crusio, PhD, CNRS Research Director.

Interdisciplinary Institute for Neurosciences (IINS) – UMR CNRS-Bordeaux University 5297 – Dr. D. Choquet**,** PhD, CNRS Research Director, Director of the Laboratory of Excellence BRAIN (LabEx BRAIN).

- Team "Synaptic Circuits of Memory" – Dr. C. Mulle, PhD, CNRS Research Director, ***Director of the Federation of Research "Bordeaux Neurocampus", Bordeaux School of Neurosciences (NENS-FENS) and President of the French Society for Neuroscience.***
- Team "Dynamics of synapse organization and function", Dr. D. Choquet**,** PhD, CNRS Research Director.
- Team "Central Mechanisms of pain sensitization" Prof. M. Landry, PhD, Professor of Neurosciences, Adjunct director of IINS (*President elect of the Mediterranean Neuroscience Society*).
- Team "Development and adaptation of neuronal circuits" Dr. L. Groc, PhD, CNRS Researcher.

Sleep, Addiction and Neuropsychiatry (**SANPSY)** - USR CNRS-Bordeaux University 3413 - Prof. P. Philip, MD PhD, Prof. of Physiology.

- Team "GENPPHAASS" Neuro-PsychoPharmacological Research Platform **-** Prof. P. Philip, MD PhD, Prof. of Physiology.

Institute for Cellular Biochemistry and Genetics (IBGC) - UMR CNRS-Bordeaux University 5095 – Dr. B. Daignan-Fornier, PhD, CNRS Research Director

- Team "AFA-Functional analysis of amyloids", Prof. C. Cullin, PhD, Professor of Genetics.

Laboratory of integration of material to system (IMS) – UMR CNRS-Bordeaux University 5218 - Prof. C. Pellet, PhD, Prof. of Electronics

- Team "Cognitics and human engineering ", Dr. J.M. André, PhD, Professor of Biology / Dr. V. Lespinet-Najib, Associate Prof. of Psychology.
- Team "Production engineering", Prof. Y Ducq, PhD, Prof. of Industrial Engineering, / Prof. B Vallespir, PhD, Prof. of Industrial Engineering.

Informatics Research Bordeaux Laboratory (LaBRI) - UMR CNRS-Bordeaux University 5800 - Dr. P. Weil, PhD, CNRS Research Director.

- Team "Image and sound". Prof. J. Benois-Pineau, PhD, Prof. of Computer Science / Dr. P. Coupé, PhD, CNRS Researcher.

Optic Institute-Graduate School – UMR CNRS-Bordeaux University 5298 - Dr P. Bouyer, PhD, CNRS Research Director.

- Laboratory of Numeric Photonics and nanosciences (LP2N) – Dr. L. Cognet, PhD, CNRS Research Director.

Institute of Molecular Sciences (ISM) - UMR CNRS-Bordeaux University 5255 - Dr. P. Garrigues, PhD CNRS Research Director.

- Team "PHotonics and Omics ENabled by Innovations in Chemical Synthesis"- Dr. M Blanchard-Desce, PhD, CNRS Research Director.

Emile Durkheim Center for Political Sciences and Comparative Sociology (CED) – UMR CNRS-Bordeaux University and Sciences Po Bordeaux 5116 – Dr. A. Smith**,** Research Director FNSP.

- Team « Sociologie de la science et de l'innovation technologique » - Prof. P. Ragouet, PhD, Prof. of Sociology.
- Team "Ethics of research communication » - Dr. F. Gonon, PhD, Emeritus CNRS Research Director.

Research Group on Theoretic and Applied Economics (GREThA) - UMR CNRS-Bordeaux University 5113- Prof. M.A. Sénégas, PhD, Prof. of Economics.

- Team "Innovation, Science & Industry" - Prof. P. Gorry, MD PhD. Associate Prof. of Cell Biology, *CFO of the University Incubator* / Dr. M. Montalban, Associate Prof. of Economics.
- Team "Welfare, city & development" - Prof. E. Petit, PhD, Prof. of Economics / Prof. C. Aubert, PhD, Prof. of Economics (*joint appointment at Toulouse School of Economics*).

PACEA: From Prehistory to nowadays: culture, environment, anthropology - UMR CNRS-Bordeaux University 5199 French Ministry of Culture and Communication – Dr. B. Maureille, PhD, CNRS Research Director.

- Team "Anthropology of present and past populations" - Dr. D. Castex, PhD, CNRS Research Director / Dr. Y. Heuzé, PhD, Junior Chair Bordeaux Archaeological Sciences Cluster of Excellence.

B.1.3. With INSERM (National Institute of Health and Medical Research).

The Bordeaux Population Health Research Center (BPH) – UMR INSERM-Bordeaux University 897- Prof. C. Tzourio, MD PhD, Prof. of Epidemiology and Public Health.

- Team "Psycho-epidemiology of aging and chronic diseases" - Prof. H. Amieva, PhD, Prof. of Psychology.
- Team "VINTAGE: Vascular and neurological diseases: integrative and genetic epidemiology" - Prof. S. Debette, MD PhD, Prof. of Epidemiology and Public Health / Dr. C. Dufouil, PhD, Research Director INSERM.
- Team "LEHA: Lifelong exposures, health and aging" - Dr. C. Delcourt, PhD, INSERM Researcher.
- Team "Biostatistics" - Dr. H. Jacqmin-Gadda, PhD, INSERM Research Director.
- Team "Health economics" - Prof. J. Wittwer, PhD, Prof. of Economic Sciences.
- Center for Clinical Investigation (CIC) - Clinical Epidemiology (CIC-EC), Prof. G. Chène, MD PhD, Prof. of Epidemiology and Public Health, ***Director of the French ITMO for Public Health (AVIESAN).***

Neurocentre Magendie (NCM) - Physiopathology of Neuronal plasticity – UMR INSERM-Bordeaux university 862 – Dr. P.V. Piazza, MD PhD, INSERM Research Director.

- Team "Glia-neuron interactions" - Dr. S. Oliet, PhD, CNRS Research Director, joined (01-01-2016) by the Team "Pathophysiology of motor systems" - Prof. G. Le Masson, MD, PhD, Prof. of Neurology.
- Team "Pathophysiology of declarative memory"- Dr. A. Marighetto, PhD, CNRS Researcher.

Helicobacter infection: inflammation and cancer – UMR INSERM-Bordeaux University 853- Prof. F. Megraud, MD PhD, Prof. of Bacteriology.

- Team "H. pylori infection in the progression of Alzheimer's disease (AD)**"** - Prof. Nathalie Salles, MD, PhD, Prof of Gerontology.

B.1.4. With INRIA (National Research Institute in Computer Science and Automation)
Bordeaux-Sud-Ouest – Dr. M. Thonnat, PhD, Research Director Inria.
Inria teams:

- Team "FLOWERS - Developmental and social robotics" - Dr. P.Y. Oudeyer, PhD, Inria Research Director and Ensta ParisTec.
- Team "GEOSTAT - Geometry & statistics in acquisition data" - Dr. H. Yahia, PhD, Inria Researcher.

Inria teams associated to LaBri (CNRS-Bordeaux University):

- Team "PHOENIX - A Multi-Disciplinary Approach to Orchestrating Networked Entities" - Prof. C. Consel, Prof. at Bordeaux Institute of Polytechnics / Prof. H. Sauzeon, PhD, Prof. of Psychology and Cognitive Science.
- Team "POTIOC - Popular Interaction", Inria Joint Project Team - Dr. M. Hachet, PhD, Inria Researcher.

B.1.5. With INRA (National Institute of Agricultural Research).

NutriNeurO – UMR INRA-Bordeaux University 1286 – Dr. S. Layé, PhD, INRA Research director.

- Team "Psychoneuroimmunology and nutrition: clinical and experimental approaches" – Dr. S. Layé, PhD, INRA Research Director.
- Team "Nutrition, nuclear receptors and brain aging"- Prof. V. Pallet, PhD, Prof. at the Institut National Polytechnique.

B.2. Single label Bordeaux University associated teams (EA).

Handicap, Activity and Cognition to Health – HCAS - EA 4136 Bordeaux University - Prof. P.A. Joseph, MD PhD, Prof. of Physical Medicine and Rehabilitation.

Institute of Health Law, Bordeaux Montesquieu University – Prof. P. Combeau, Prof. of Public Law / Dr. L. Bloch, PhD, Associate Prof. of Private Law.

- CERFAP European Centre for studies and research in family and persons law (EA 4600) - Neurosciences and "Neuro-Law" - Dr. L. Bloch, Associate Prof. of Private Law.
- CERDARE Centre for study and research in administrative law and in the reform of the State (EA 505) - Prof. A. Rouyère, PhD Prof. of Public Law / Dr. C. Castaing, PhD, Associate Prof. of Public Law.

Rare Diseases: Genetics and Metabolism laboratory (MRGM), EA4576, Bordeaux University - Prof. D. Lacombe, MD PhD, Prof. of Medical Genetics.

- Team "Neurogenetics Group", Prof. C. Goizet, MD PhD, Prof. of Medical Genetics / Dr I. Coupry, PhD, INSERM Researcher.

C. Associated partners.

"La Maison du Cerveau" (Brain's Home), President JB Proux**.** Non-profit association bringing together representatives of patient's associations (*France Parkinson, France Alzheimer, Association Française contre la Sclérose en Plaques, Epilepsie France, Un arc en ciel contre la Chorée de Huntington*), researchers and clinicians against neurological diseases, founded in 2012 ("BIND" *Coordinator is a co-founder*) and hosted by Neurocentre Magendie at Bordeaux University.

Glossary

Support institution of the teams / Tutelle(s) des équipes

Support Institutions (*for detailed affiliation for each team see above*):

- Bordeaux University (BU)
- University Hospital of Bordeaux (CHU-B)
- National Center for Scientific Research (CNRS)
- National Institute of Health and Medical Research (INSERM)
- National Institute of Agricultural Research (INRA)
- National Institute for Research in Computer Science and Control (INRIA)
- French Alternative Energies and Atomic Energy Commission (CEA)

I - CV of coordinator showing excellence and his/her previous experience in research, in education and in management of large group of individuals (H index and five relevant publications in high IF journals and top 10% citation); (1 page max, in English)

François Tison, aged 53 years, is Professor of Neurology at Bordeaux University (BU) - Consultant Neurologist at the University Hospital of Bordeaux (CHU-B) (CV). He is currently head of the Institute of Neurodegenerative Diseases-clinical branch (IMNc, 40 personnel staff), the Memory Clinic (CMRR) and the Motricity Unit at the Department of Clinical Neurology (42 personnel staff), CHU-B, and adjunct director of the Institute of Neurodegenerative Diseases (IMN, CNRS UMR 5293, 130 personnel staff), BU. He has been trained at BU, where he obtained a University Diploma in Clinical Research and Epidemiology in 1989, his MD thesis and board certification in Neurology in 1990, and a PhD in Neurosciences in 1993. He teaches neurology at BU, and takes care of patients at the Dept. of Neurology, CHU-B, since 1990. He has been a research fellow at the Institute of Neurology (Movement Disorders Unit), Queen Square, London, UK in 1994. He has been regional, then inter-regional coordinator (1998-2006) of the Neurology certification diploma (DES), and co-directs the University Diploma of Neurodegenerative Diseases, since 2012. He conducted his clinical and research career in the field of neurodegenerative diseases, particularly on Parkinson's disease (PD) and related disorders. He created in 1998 the Movement Disorders Unit at CHU-B (Haut-Lévêque Hospital), where he was also head of the Neurology Dept. (1998-2014), and in 2014 the Motricity-Epilepsy Unit at Pellegrin Hospital (CHU-B), where he is adjunct director of the Clinical Neuroscience Center since 2014. He created the Reference Center for Huntington's disease (HD) in 1994, the Reference Center for multiple system atrophy (MSA) in 2003, and the Regional and Inter-regional Expert Center for PD in 2011, both of which are now headed by Prof. W. Meissner. Prof. Tison explored several fields of basic, translational, epidemiological and clinical research. He studied the anatomical neurochemistry of dopamine neurotransmission during his PhD thesis (Prof. B. Bloch). From 1998 to 2006 he directed the research group "Nigrostriatal Degeneration" (former CNRS UMR 5227), where he developed new animal models of atypical parkinsonism, before joining and co-developing with Dr. E. Bezard the IMN. He also conducted epidemiological studies on PD and related disorders in population-based cohorts (PAQUID) at the Institute of Public Health and contributes to ongoing cohorts on AD (MEMENTO). He coordinated as PI multiple academic, industry or foundation-sponsored clinical research studies on neuro-pharmacology, pathophysiology and biomarkers in PD and AD. Today 30 clinical research studies are running at the IMNc. He also actively contributes to National and European networks and EC-funded programs. He served on several scientific committees (French patient's association for PD, MSA, PSP) as officer for different societies (French Neurological Society and as treasurer of the European section of the International Movement Disorder Society) and as reviewer in many peer-reviewed journals. **He authored or co-authored 226 publications. In addition, he published 54 papers as part of a study group and 35 textbook chapters (one book edition). His h index is 42, and g index 73. He received 6716 citations (without self-citations) and published, between 2010-2014, 9 papers in the top 10% of most cited papers**.

- Tison F, Meissner WG. Movement disorders in 2013: diagnosing and treating PD-the earlier the better? *Nat Rev Neurol. 2014;10:65-6. (IF= 14.01).*
- Wenning GK,…, Rascol O, Meissner WG, Tison F, Poewe W; European Multiple System Atrophy Study Group. The natural history of multiple system atrophy: a prospective European cohort study. *Lancet Neurol. 2013;12:264-74. (IF=21.8).*
- Foubert-Samier A, Helmer C, Perez F, Le Goff M, Auriacombe S, Elbaz A, Dartigues JF, Tison F.. Past exposure to neuroleptic drugs and risk of Parkinson disease in an elderly cohort. *Neurology. 2012;79:1615-21. (IF=8.2).*
- Perez F, Helmer C, Foubert-Samier A, Auriacombe S, Dartigues JF, Tison F. Risk of dementia in an elderly population of Parkinson's disease patients: a 15-year population-based study. *Alzheimers* Dement. 2012;8:463-9. (IF=14,5, 2012, =17,5 2013).
- Meissner WG, Frasier M, Gasser T, Goetz CG, Lozano A, Piccini P, Obeso JA, Rascol O, Schapira A, Voon V, Weiner DM, Tison F, Bezard E. Priorities in Parkinson's disease research. *Nat Rev Drug Discov. 2011;10:377-93. (IF= 29, 2011, = 37, 2014).*

II - Center of excellence in the field of neurodegenerative disorders

II – 1 Le centre d'excellence / the center of excellence

Résumé montrant les acquis d'excellence du futur centre (20 lignes max incluant les liens des sites web si disponible)

L'initiative Bordelaise pour les maladies neurodégénératives (MND) « BIND » est présentée par l'**Université de Bordeaux** (UB), 3ième université multidisciplinaire française, avec un programme d'**initiative d'excellence** (IdEx Bordeaux), associée au **CHU de Bordeaux** (CHU-B), 3ième CHU régional français en recherche clinique. Son objectif est de créer du **lien** entre des disciplines et MND multiples, dans un continuum recherche pré-clinique-clinique vers un meilleur soin. Ce projet transdisciplinaire, tourné vers le patient, reposera sur un **noyau d'excellence** et dynamisera l'attraction d'autres disciplines vers les MND. Il est constitué d'équipes appartenant : 1/ Au Neurocampus Bordeaux et cluster LabEx BRAIN; 2/ A l'institut de Santé Publique (BPH) et la plateforme Santé Société (Cassiopée), ses cohortes, son expertise en méthodologie de la recherche clinique et de l'essai thérapeutique; 3/ Au centre de bio-imagerie-IBIO et cluster LabEx TRAIL; 4/ Aux infrastructures de soin et de recherche clinique du CHU-B, en particulier la plateforme clinique de l'Institut des Maladies Neurodégénératives (IMNc), la clinique de la SEP et les CIC-P et CIC-EC. Ces équipes ayant un dynamisme ancien dans les MND (publications 2010-15 : Park=490, Alz=509, SEP=167) et des **collaborations transdisciplinaires actives**, uniront leurs efforts, en s'appuyant sur des **clusters d'excellence,** avec des équipes issues des composantes "Science et Technologies", "Sciences Humaines et Sociales", Economie et Droit. BIND favorisera l'enseignement transdisciplinaire à travers **l'Ecole des Neurosciences de Bordeaux** (NENS network), l'école de Santé Publique et l'école doctorale SP2 (Société, Politique, Santé Publique). BIND saisira l'opportunité d'un **cluster régional** sur les systèmes d'information et technologies pour la santé, pour promouvoir transfert et valorisation.

Abstract illustrating the recognition of the excellence of the future center; (20 lines max including link on website if available)

The Bordeaux Initiative for Neurodegenerative Disorders (ND) « BIND » is led by **Bordeaux University** (BU), 3rd French multidisciplinary and "***Initiative of Excellence***" awarded University (IdEx Bordeaux), associated with the **University Hospital of Bordeaux** (CHU-B), 3rd regional French CHU in clinical research. It aims at **bounding** multiple disciplines and ND, along a continuum from preclinical to clinical research to improve care provision. This patient-centred, centripetal and transdisciplinary initiative for ND will rely on a **core** of recognized **excellence** and will promote links with other disciplines. The core is constituted by leading teams belonging to: 1/The Bordeaux Neurocampus and cluster of excellence LabEx BRAIN; 2/ The Bordeaux Population Health Research Center (BPH) and Health-Society platform (Cassiopée), cohorts and expertise in clinical research methodology; 3/ The bio-imaging centre-IBIO and clusters of excellence LabEx TRAIL; 4/ Patient care and clinical research infrastructures of the CHU, particularly the emblematic clinical platform of the IMN (IMNc), the MS clinic and the Centre for Clinical Investigation Pharmacology and Clinical Epidemiology. These teams, with a strong research background in ND (publications 2010-15: PD=490, AD=509, MS=167) and existing **active trans-disciplinary local collaborations**, will interact, based upon clusters of excellence, with teams issued from "Science and Technologies", "Human and Social Science", Economy and Law of BU. BIND will promote transdisciplinary education through the **Bordeaux School of Neuroscience** (NENS network), the School of Public Health and the PhD School "SP2"(Societies Politic Public Health). BIND will also take advantage of a regional **cluster in health information** systems and technology to promote efficient transfer and valorisation.

Abstract describing the governance of the future center (20 lines max, in English)

The executive structure of “BIND” will be the **Coordination and Executive Committee** (**CEC**), constituted of 15 members: the **Coordinator (F. Tison**), an **Adjunct-Coordinator (E. Bezard**, IMN director), the head of the Dept. of Neurology (B. Brochet), the directors/representative of the Bordeaux BPH Center (C. Tzourio), the Bordeaux Neurocampus (C. Mulle), the Bio-Imaging Center (B. Mazoyer), the Center of Clinical Investigation-Epidemiology (CIC-EC, G. Chène) and Pharmacology-Neuroscience (CIC-P, P. Philip), the Clinical Research and Innovation Direction of CHU-B (J. Martinez), the Scientific Council of BU (P. Dos Santos), and 5 representatives of the Technical and Scientific committees (TSCs). The CEC will (i) coordinate the actions, enabling thereby communication, cooperation and collaboration between the TSCs, (ii) promote collaborative studies, (iii) support fund raising, (iv) seek for grant calls and provide application coordination, (v) manage the relationship with regional and national scientific and health authorities as well as with the city and the region. The CEC will meet 3 times a year. Five **Technical and Scientific Committees** (TSCs) composed of 10 persons each, coordinated by a representative, will meet 4 times a year alone or in coordinated assemblies. TSCs will propose actions to the CEC and conduct actions proposed by the CEC. The CEC and TSC general meeting will take place once a year and promote a scientific meeting on initiated and planned collaborative research. TSCs are as follows: 1/ Basic, preclinical and translational research, 2/ Clinical research, 3/ Research in social sciences, economics and ethics, 4/ Technological innovations and transfer, and 5/ Dissemination, education, and relationship with users.

II – 2 Basic, preclinical and translational research

Abstract: illustrating the expertise and its transversality (15 lines max, including link on website if available)

BIND encompasses fundamental, preclinical and **translational** research in ND, with expertise, manpower and a unique **multidisciplinary** nature that will ground, based upon **excellence** of the BU community (LabEx BRAIN and LabEx TRAIL), the effective translation to improvement of patient's care. BIND teams have a proven international excellence in translational ND science in synaptopathy, synaptic deficits in AD, glia-neuron interactions and neuronal death mechanisms, animal models of PD, MSA, AD, MS, ALS, memory pathophysiology, alteration of brain networks and neurotransmitter systems, including brain imaging, PD therapeutics (including DBS), methods of (genetic) epidemiology, and mechanisms and consequences of neuro-inflammation on neurons and glia. This expertise along with 1/ **Transversal platforms** for primate and rodent models (EquipEx OPTOPATH), brain and cell imaging (respectively IBIO and BIC), and biostatistics; 2/ Long-term and solid collaborations between core members 3/ New interactions with backgrounds that will reinforce fundamental biological research capabilities as well as unique support in physics, chemistry, robotics, and big data management, will enable BIND to move to the next level of **integration** by favoring internal cross-disease multidisciplinary collaborations.

2 pages (max) of the best publications of the center

Ahmed M, Berthet A, Bychkov E, Porras G, Li Q, Bioulac B, Carl YT, Bloch B, Kook S, Aubert I, Dovero S, Doudnikoff E, Gurevich VV, Gurevich EV, Bezard E. Lentiviral overexpression of GRK6 alleviates L-dopa-induced dyskinesia in experimental Parkinson's disease. *Science Translational Medecine. 2010, 2:28ra.*

Babin PJ, Goizet C, Raldúa D. Zebrafish models of human motor neuron diseases: advantages and limitations. *Prog Neurobiol. 2014*, 118:36-58.

Bassil F, Fernagut PO, Bezard E, Meissner WG. Insulin, IGF-1 and GLP-1 signaling in neurodegenerative disorders: targets for disease modification? *Prog Neurobiol. 2014;118:1-18.*

Bazinet RP, Layé S. Polyunsaturated fatty acids and their metabolites in brain function and disease. *Nat Rev Neurosci. 2014,15:771-85.*

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II – 3 Clinical research

Abstract: illustrating the expertise and its transversality (15 lines max, including link on website if available)

BIND offers **expertise in multiple domains** of clinical research on PD, AD and MS including methodology and biostatistics, imaging, epidemiology, genetics, clinical trials, and neuropsychology based on 1/ More than 7000 patients actively followed in labeled reference (PD, CMRR, MS) and rare diseases (MSA, ALS, HD) centers, as well as geriatric dept.; 2/ **Transversal clinical research platforms**: CIC-P and Neuro-Psycho-Pharmacological Research Platform, IMNc and Institute of Bio-Imaging (IBIO), EquipEx PHENOVIRT (Virtual Reality); 3/ Coordination or contribution to **cohorts** (MEMENTO, 3C study, PAQUID, OFSEP, COPARK) and national and international genetic databanks and consortia (PD genetic, CHARGE, JPND network H-READY, SPATAX, EHDN…) and 4/ Expertise in the field of **methodology** in clinical research (CIC-EC, F-CRIN, NS-PARK, EUCLID Platform). Transversal actions in the 3 major diseases concern epidemiology, including prevention strategies and genetics, early clinical diagnosis, biomarker development, natural history and prognosis, treatment strategies including non-pharmacologic approaches (physical and cognitive rehabilitation, nutrition, ETNA3 project…), patient re-insertion at home and in society (working abilities, e-health, driving…), and care in institutions (telemedicine, late stage PD…).

2 pages (max) of the best publications of the center, the clinical trials coordinated by the center and the cohorts developed or coordinated

1. Best Publications (2010-2015)

Amieva H, Mokri H, Le Goff M, Meillon C, Jacqmin-Gadda H, Foubert-Samier A, Orgogozo JM, Stern Y, Dartigues JF. Compensatory mechanisms in higher-educated subjects with Alzheimer's disease: a study of 20 years of cognitive decline*. Brain. 2014,137:1167-75.*

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2. On-going Clinical Research studies and Trials at Bordeaux University Hospital (CHU-B)

	Academic CHU-B Promoted	Academic	Industry Promoted		Total
DISEASES	**PI**	**Co-pi**	**Co-Pi**	**Pi**	
Mult. Scler	9	6	21	2	38
Alzheimer	3	8	12	2	25
Parkinson	8	8	4	1	21
MSA	4	1		1	6
ALS		3			3
Total	**24**	**26**	**37**	**5**	**93**

3*. Cohorts developed and coordinated*

MEMENTO study: a multicenter national prospective observational cohort of 2,300 non-demented individuals with either isolated cognitive complaints or light to mild cognitive deficits consecutively recruited from French memory clinics (CMRR). The aim of MEMENTO is to explore the mechanisms of progression from early signs of AD or associated disorders to clinical dementia through the study of several clinical markers and biomarkers of brain pathologies, and also to contribute to the definition of criteria for early diagnosis of AD. Ancillary studies aim at studying sleep (SCOAL), amyloid-PET imaging (AMYGING), and vascular dementia (VASCOG).

3 large population-based cohorts with data on socio-demographics, co-morbidities, cognition, MRI imaging, genetics, psychological health, social environment, and clinical diagnosis and prognosis of dementia or PD: 1/3C study: 9294 elderly subjects selected in general population in Bordeaux, Dijon, and Montpellier followed-up for 12 years; 2/AMI cohort: 1002 elderly farmers followed-up in general population for 7 years and 3/PAQUID study: 3777 elderly subjects randomly selected in general population followed-up for 25 years.

II- 4 Research in social sciences, neuroeconnomics and ethics

Abstract: illustrating the expertise and its transversality (15 lines max, including link on website if available)

BIND, by active research and **collaborations** between core members and human and social sciences researchers (BPH, GREThA, CED), with the support of the SP2 PhD school, and thanks to large **population-based cohorts** and the "National Alzheimer Bank" (BNA), explores quality of care, ethical, economic and social burdens of ND. BIND develops 4 research axes: 1/ Dynamics of changes in cognition and dependency, psycho-social and familial functioning in aging and ND, and impact of interventions in AD, PD (EC-funded cohort-Clasp) and MS (AQUISEP network); 2/ Management and caregiver support efficiency and **cost-effectiveness** in AD, and **impact evaluation** of new structures created by the French National AD plan ("MAIA" or "ESA"); 3/ **Neuro-economic models**, innovation diffusion, decision making and impact evaluation of treatments, particularly in PD; 4/ Ethics in ND and neurosciences and its knowledge diffusion by medias. Through BIND, these teams will be joined by new research teams in **sociology** of health and science (emergence project HEADS), anthropology, health **economics** as well as the health **law** institute and Forum Montesquieu. BIND also provides to users and caregivers information and education through "Maison du Cerveau".

2 pages (max) of the best publications of the center, the reports and ongoing studies in the field

Aubert C, Reynaud A, Dubernat A, Boraud T, Petit E, *et al.,* Is there an impact of Parkinson Disease and its treatments on preferences vis à vis risk and uncertainty.*10th International Congress on Non-Motor Dysfunctions in Parkinson's Disease and Related* Disorders, Nice, France, Dec 4-7, 2014.

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Castaing C. La démocratie sanitaire : mythe ou réalité ? In « *Les études hospitalières » 2013*

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Duprat JP. Violence against ederly persons: the role of the legal medecine, *4th International Conference on Medicine and Law, Kovalam (India), 26-27 Janvier 2013.*

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Foubert-Samier A, Catheline G, Amieva H, Dilharreguy B, Helmer C, Allard M, Dartigues JF. Education, occupation, leisure activities and brain reserve: a population-based study. *Neurobiol Aging*. *2012, 33, 423.*

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Gonon F, Konsman JP, Cohen D, Boraud T. Why most biomedical findings echoed by newspapers turn out to be false: the case of Attention Deficit Hyperactivity Disorder. *PLoS ONE. 2012, 7:e44275.*

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Ongoing projects:

- Mallet E, Gonon F, Munafo M, and Smith A. Refutation and attenuation of initial findings by subsequent studies: comparison between four neurological, four psychiatric and four somatic diseases.
- Mallet E, Boraud T, Gonon F and Smith A. Preferential media covering of uncertain initial findings: comparison between four neurological, four psychiatric and four somatic diseases.
- Peyrol A, Blackburn T, Gorry P, Impact of european and US regulation on orphan designation demands for neurodegenerative diseases.
- Dubernat A, Aubert C, Economic analysis of the effects of emotions and biology on individual preferences regarding risk.
- Peres K, Dartigues JF, PAQUID cohort, to study the effects of different environmental, behavioral, and social vectors of dementia and Alzheimer's disease.
- Gouttenoire A, Castaing C. Personnes vulnérables et santé, CERFAP, granted by the Conseil régional d'Aquitaine (convention n° 20121406008).
- Nicolas P, PhD on Telemedecine "*Les enjeux juridiques de la télémédecine. Contribution à l'étude des liens entre les droits de l'homme et les innovations technologiques »*, PhD contract from IdEx HEADS [Health Determinants In Societies], co-direction Castaing C (CERDARE) and Salles N. (Dept of Geriatry, CHU-B).
- Anthropology (PACEA-UMR CNRS 5199) and Neuro-Imaging (GIN UMR5296) : Heuze Y, Crivello F, Tzourio-Mazoyer N, Mazoyer B. *Quantification of the morphological variation of the corpus callosum and its functional and evolutionary consequences.*

II – 5 Technological transfer

Abstract: illustrating the expertise and its transversality (15 lines max, including link on website if available)

BIND will take advantage of 1/ An extremely favourable regional **specialization** (50% of France's **e-health** workforce**,** international companies headquarters), academic and industrial ecosystem in digital technologies applied to health, federated by a **digital health cluster** (TIC Santé Aquitaine), and the Region's Aquitaine Living Lab; 2/ Three internationally recognized centers in e-health: the LABRI, on data mining, image analysis and bioinformatics (Integrated Project FP7 Dem@care), the IMS, on bio-electronic sensors, medical electronic devices, image processing, digital interfaces for a population with disability, digital supports for case management and Inria of Bordeaux on digital science and simulations (living platform HomeAssist), and human-computer interactions 3/ Initiated research and **collaborations** by and with ND clinicians: multi-modal MRI images for diagnosis, evaluation and prediction of AD, multiple sensors and video detection of activities of daily living in AD and falls in PD, early detection of AD by eye exploration, mobile cognitive support based on connected objects, cognitive testing, driving skills in aging and virtual environments (EquipEx PHENOVIRT); 4/ Active collaborations with the **economic world** (e.g. IMNc, IMS and AGFA Health care), and **technology transfer** agencies (e.g. Aquitaine Science Transfert, ADI, BIPSA).

2 pages (max) with the list of the patents and their exploitation, the major contracts with private companies, the list of private companies created, involvement in bioclusters or biotec incubators…

1. Selected references

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Sauzéon H, N'Kaoua B, Arvind Pala P, Taillade M, Auriacombe S, Guitton P. Everyday-like memory for objects in aging and Alzheimer's disease assessed in a visually complex environment: the role of executive functioning and episodic memory. *J Neuropsychol*. 2014 Oct 13. doi: 10.1111/jnp.12055.

2. Selected Patents/software

- "Système d'affichage de données caractérisant l'activité cérébrale d'un individu, procédé et programme d'ordinateur associé", Lécuye A, Mercier-Ganady J, Lotte F, Marchal M, France, Patent n° : 13/63180. 2013.,
- Platform VirtualEnaction, computational models software, Alexandre F, Garenne A, Rougier N, Viéville T.
- DiaSuite is a Tool suite guiding the developer during the creation of network-centric spaces. Precisely, it is a design language dedicated to describing pervasive computing systems and a suite of tools providing customized support for each development stage of a pervasive computing system.
- Collins DL, Coupé P. Simultaneous segmentation and grading of structures for state determination. Publication No. WO/2013/037070. International Application No. PCT/CA2012/050644. Used by the company truepositive, products: MCIMETRIX: aid to prognosis in AD, AlzMETRIX: aid to diagnosis in AD.
- In MS, University Hospital (CHU) and Bordeaux University, Brochet B: Computer Screening Test (CSCT) Version 1 Aug 27th 2013. IDDN FR 001 18001 000 S P 2014 000 31230.
- MRI softwares : MRI denoising Package, P. Coupé, J.V. Manjon, 2013, 2014 and volBrain : online MRI brain volumetry system, Manjon JV , Coupé P, 2015.

- Olive J, Fabrigoule C, Sagaspe P, Philip P. Virtual Supermarket licence /PHENOVIRT-Immersion SARL.
- Fabrigoule C, Sagaspe P, Philip P. Driving scenario in aging licence /PHENOVIRT- Oktal
- Winderickx J, Cullin C: A yeast model for synergistic toxicity of abeta and tau. Patent application 913116-913116-FD/AC.
- Patents & Software from EA 41 36, Joseph PA (Physical Medicine and ReAdaptation).

  -Patent INPI 06/06/2014 : FR 2975602 (A1) - Appareil de Conditionnement Physique (Physical conditioning apparatus) - « Bascule Sensori-Motrice – BSM – Gurtler SA ».

  -Corset Dtpa-Appareillage des déformations camptocormiques du tronc (Appartus for camptocormia) (diffusion Lagarrigue aquitaine company).

  -AGATHE software plateforme logicielle d'évaluation et d'entrainement cognitif (cognitive training) (Arts Mines / Dassault Systems Intempora).

  -Software ABC Com: cahier numérique de communication APHACOM sur support imagé pour l'aphasique (aphasia) (marketed by SARL C-COM).

  - "Virtual Bordeaux District" (quartier Virtuel de Bordeaux) probing spatial learning and memory for neurological patients.

  - HOMES (Human Object Memories from Everyday scenes) Test is a Virtual reality application that proposes an everyday-like memory assessment for old adults.

3. Selected major contracts with private companies

AGFA Healthcare, *"GPS for integrated care",* EC-H2020 call topic PHC25 with IMNc, Agfa Healthcare French Headquarters Artigues-près-Bordeaux, France.

Dassault Systems, France.

Explora Nova, Bordeaux University, France.

EyeBrain, Paris France.

IMETRONIC, Pessac France.

IMMERSION, SARL (Virtual Supermarket and cognition/aging), Bordeaux France.

IMMUSMOL, Pessac France.

LinkCare Services, Paris France.

"Object's World" with BPIFrance (Ex OSEO) joining 2 companies, SigFox and Telecom design, France.

OKTAL, France (driving simulation and aging)

«TruePositive. Medical Device Inc », Canada.

Vision Scope SARL, France.

4. Private companies created

Motac neuroscience Ltd, Manchester, UK.

Fluofarma, Bordeaux, France.

5. Bioclusters or biotec incubators

TIC Santé Aquitaine, and brochure in English.

Route des lasers, photonics cluster in Aquitaine, Talence France.

Aquitaine Regional Incubator, University regional incubator, Talence France.

Bordeaux Unitec, Technopole Transfer, Pessac France.

III - Signatures

After reading the call for the identification of centers of excellence in the field of neurodegenerative disorders, I give my consent to the participation of the institution I represent to the center of excellence.

Coordinator of the center
"BIND"- Bordeaux Initiative for Neurodegenerative Disorders -
Last and first name
Tison François

Pr F.TISON
Pôle Neurosciences cliniques
Centre Expert Parkinson UF 1258
Institut des maladies Neurodégénératives
Groupe Hospitalier Pellegrin

Date : 26/05/2015

Signature

Institution in charge of the center
University of Bordeaux, President
Last and first name
Tunon de Lara Manuel

Date : 26/05/2015

Signature

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