**PRESS RELEASE**

September 27, 2012

## Pioneer of Diffusion MRI for Acute Stroke Diagnosis
## Dr. Denis Le Bihan, Founding Director of France's NeuroSpin
## for Ultrahigh Field MRI, Receives Honda Prize 2012

The Honda Foundation, a public-interest incorporated foundation created by Honda Motor's founder Soichiro Honda and his younger brother Benjiro Honda and currently headed by Hiroto Ishida, is pleased to announce the Honda Prize 2012 will be awarded to Dr. Denis Le Bihan for his leading role in establishing the Diffusion Magnetic Resonance Imaging (Diffusion MRI) modality as a universal method to study and diagnose acute stroke and other neurological disorders. The Founding Director of France's NeuroSpin for Ultrahigh Field MRI, Dr. Le Bihan also teaches at Kyoto University Graduate School of Medicine's Human Brain Research Center. Dr. Le Bihan is the 33rd laureate of the Honda Prize[*1].

Dr. Denis Le Bihan is a pioneer of the Diffusion MRI concept from theorization of water diffusion measurement by MRI to its application in clinical practice, and his innovative imaging techniques have rapidly spread throughout the world. Combined with the advance of intravenous thrombolytic therapy, Diffusion MRI has spared many patients suffering acute stroke by drastically shortening the time required for diagnosis within just minutes to a few hours after the stroke onset, when brain tissue is still salvageable. Crisp Diffusion MRI images also facilitate the diagnosis of other neurological diseases and the determination of the extent of tumor dissection before performing surgery, leading to a drastic decline in the risk of damaging white matter fibers associated with bodily function during surgical procedures.

Indeed, Diffusion MRI has also become a powerful tool to map the wiring of the brain, which has been on the front line of modern neuroscience research, especially in such related field as cognitive neuroscience, neuropsychology, and neuroeconomics. The Diffusion MRI technology is opening up new lines of inquiry to investigate faulty brain connections associated to brain illnesses, such as aging and neurodegenerative diseases (Alzheimer, Parkinson's disease), mental health disorders (autism, schizophrenia), addiction and other neurological diseases, because by analyzing Diffusion MRI images one can determine exactly which and how nerve fibers are lost or damaged in the brain due to these disorders.

Another promising application of Diffusion MRI includes early detection of tumors and metastases as diffusion of water in cancer lesions (liver, prostate, breast) is deeply affected.

The principles and measurement techniques underlying Diffusion MRI are rooted in the classic formula proposed for Nuclear Magnetic Resonance (NMR) by E. O. Stejskal and J. E. Tanner in 1965. Dr. Le Bihan studied NMR imaging intensively and suggested that diffusional movements of water and other molecules inside the body could be used to visualize microscopic structure and function of the organs and tissues being observed with MRI. Dr. Le Bihan devised the Diffusion MRI method for clinical practice by noninvasively visualizing behavior of water diffusion inside the brain when water molecules move in a strong magnetic field gradient.

Dr. Le Bihan's Diffusion MRI method has spread across the world for the immediate treatment of acute stroke and other neurological disorders and has saved large number of lives. The Honda Foundation believes his services to society are appropriate for the Honda Prize as an embodiment of the ideals of ecotechnology[2].

The 33rd award ceremony for the Honda Prize will be held at the Imperial Hotel in Tokyo on November 19th, 2012. In addition to the prize medal and certificate, sub-prize money of 10 million yen will be awarded to the laureate.

[1] Honda Prize: Japan's first international science and technology award inaugurated in 1980. It is recognized as one of the most important awards of the world by the U.S. International Congress of Distinguished Awards.

[2] Ecotechnology: Coined from 'ecology' - the house of civilization - and 'technology.' It has been put forward since 1979 as the guiding philosophy for a better symbiosis between technology-driven civilization and nature.

For more information, contact the Honda Foundation via:

phone at +81-3-3274-5125 or fax at +81-3-3274-5103

Honda Yaesu Building, 2-6-20 Yaesu, Chuo-ku, Tokyo 104-0028, Japan

http://www.hondafoundation.jp/en/

You may also contact Honda Motor's Public Relations Department at +81-3-5142-1512.

# Dr. Denis Le Bihan

### M.D., Ph.D., Director NeuroSpin, CEA Saclay

**Born**: July 30, 1957 in Nanterre, France (French citizenship)

## Education and Training

**Medicine** (University of Paris):
- **1987**: French Board Certification in Radiology.
- **1984**: MD, Doctor in Medicine with Distinction, University of Paris.
- **1981-87**: Residency in Neurosurgery, Nuclear Medicine and Radiology.

**Physics** (University of Paris):
- **1987**: PhD in Physical Sciences, with High Distinction, Ecole Polytechnique.
- **1985**: Extensive Studies Degree (DEA) in Nuclear and Elementary Particles Physics, with Distinction.
- **1984**: Maitrise ("MA") in Fundamental Physics, with High Distinction.
- **1983**: Licence ("BS") in Fundamental Physics, with High Distinction.

**Human Biology** (University of Paris):
- **1979**: Higher Studies Degree in Neurophysiology and Central Nervous System Functional Exploration.
- **1978**: Extensive Studies Degree (AEA) in Biomathematics, Data Processing and Statistics, with major in Mathematical Models in Medicine.
- **1977**: Higher Studies Degree in Computer Sciences.
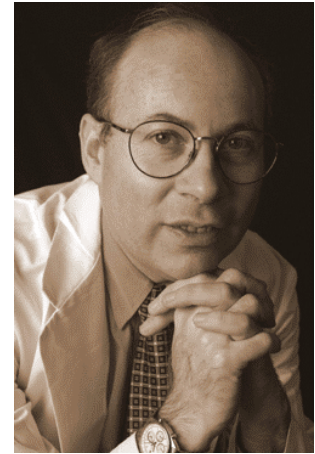
## Employment history

**NeuroSpin,** CEA-Saclay, France 2007-present: Director

**Kyoto University,** Japan: 2005-06, 08-present: Invited Professor, Graduate School of Medicine, Human Brain Research Center

**Federative Research Institute on Functional Neuroimaging**, Paris, France: 2000-present: Director

**Service Hospitalier Frédéric Joliot, CEA**, Orsay, France 1999-2006 : Director, Laboratory of Anatomical and Functional Neuroimaging 1997-98: Vice-Head and Research Director 1994-96: Chief, Research and Methodology Section.

**Georgetown University Hospital**, Washington, DC, USA, 1991-96: Clinical Associate Professor of Radiology, Dept. of Radiology, 1989-91: Clinical Assistant Professor of Radiology, Dept. of Radiology.

**National Institutes of Health**, Bethesda, MD, USA 1990-94: Chief, Diagnostic Radiology Research Section (with Tenure) 1987-90: Visiting Associate, Diagnostic Radiology Department, Clinical Center.

## Biographical Sketch

Denis Le Bihan has achieved international recognition for his outstanding contributions to the development of new imaging methods allowing, in particular studying human brain function. His work has combined extremely innovative methods, developed for Magnetic Resonance Imaging (MRI) with the application of these methods to questions of the utmost scientific and clinical importance. He is a full member of the French Academy of Sciences and currently the Founding Director of NeuroSpin, a new Institute aimed at developing and using ultra high field Magnetic Resonance to understand the brain, from mouse to man. He has authored or co-authored over 250 articles, book chapters and review articles in the fields of MRI, imaging, neuroscience and radiology. For his contributions, he was awarded in 2001 the Gold Medal of the International Society for Magnetic Resonance in Medicine. He is also the 2002 recipient of the Lounsbery Award from the National Academy of Sciences (USA) and French Academy of Sciences and a 2003 corecipient (with S. Dehaene) of the prestigious Louis D. Award of the Institut de France. He is Knight of the French National Order of Merit.

## Publications

**Imagerie par Resonance Magnetique**: Bases Physiques. Masson, Paris, 1984. **Magnetic Resonance Imaging of Diffusion and Perfusion**: Applications to Functional Imaging. Lippincott-Raven Press, NY, 1995. **Water, the forgotten biological molecule** (with H. Fukuyama), 2011, Pan Stanford Publishing, Singapore, **Le cerveau de cristal, ce que la neuroimagerie nous révèle** (in press, Odile Jacob)