John HARDY教授
Prof. John HARDY

理學榮譽博士
Doctor of Science *honoris causa*

World-renowned neuroscientist Prof. John HARDY is known as the father of Alzheimer's disease (Alzheimer's) genetic studies, who started his research in the devastating neurodegenerative diseases in the 1980s when the entire academia knew almost nothing about it.

With more than 100,000 citations, Prof. Hardy is a household name in his field as the most-cited Alzheimer's researcher in the UK. He was most recently Head of the Department of Molecular Neuroscience at University College London (UCL), and is currently Chair of Molecular Biology of Neurological Disease at UCL as well as Principal Investigator at the UK Dementia Research Institute of the Institute of Neurology. He began his research in the pathology and neurochemistry of Alzheimer's only by chance when he was a postdoctoral researcher at the Swedish Brain Bank in Umeå, Sweden.

Prof. Hardy received his Bachelor's degree in Biochemistry from the University of Leeds in 1976, and his PhD in Neurochemistry from the Imperial College London (ICL) in 1981. As a scientist, the excitement of being the first person to understand a problem prompted him to engage in the life-long search for a cure that would benefit millions of people.

A few years later, he began to realize the importance of understanding how the disease started and turn to study the genetics of Alzheimer's that subsequently led to many remarkable breakthroughs. In 1985, he became Assistant Professor of Biochemistry at St. Mary's Hospital at ICL and started genetic studies of Alzheimer's there. Afterwards, Prof. Hardy's career was irrevocably linked with neurogenetics studies. Between 1989 and 2007, he moved to the US to take up a number of important positions at different institutions including the University of South Florida in Tampa, the Mayo Clinic in Jacksonville, Florida, and the National Institute on Aging in Bethesda, Maryland.

In 1991, Prof. Hardy and his team discovered the first genetic mutation of the amyloid precursor protein (APP) gene, which is linked to familial Alzheimer's and later presented the amyloid cascade hypothesis, which implicates a build-up of amyloid protein as the starting event that damages the nerve cells. That mutation was the first known cause of Alzheimer's, and since then, nearly all basic science and medical research of the disease has been based on this discovery, continuing even today.

While this was a great breakthrough, it did not satisfy Prof. Hardy, who went on to study the genetic factors underlying other neurodegenerative diseases, hence providing a bird's eye view on a number of diseases of the kind. He is one of the investigators in the International

John HARDY教授是舉世知名的神經科學家，享有「阿茲海默症基因研究之父」的美譽。早於80年代，當整個學術界對各種神經退化性疾病幾乎一無所知之際，他已著手進行有關研究。

Hardy教授是神經生物學領域家喻戶曉的人物，其論文獲引用超過10萬次，是英國最廣獲徵引的阿茲海默症研究學者。他曾任英國倫敦大學學院（UCL）分子神經科學學系主任，現為神經疾病分子生物學講座教授，身兼UCL神經內科研究院轄下的英國認知障礙症研究所首席研究員。他對阿茲海默症的病理學和神經化學研究，始於在瑞典于默奧腦科研究中心進行博士後研究時期，事出巧合，卻成就非凡。

Hardy教授於1976年畢業於利茲大學，獲生物化學學士學位，及後於1981年成為英國倫敦帝國學院（ICL）神經化學博士。身為科學家，因為率先洞悉問題所在而產生的喜悅和興奮，驅使他不吝投入半生精力，矢志追尋治療方法，為數以百萬計病人帶來曙光。

數年後，Hardy教授開始明白研究病因才是至關重要的一步，遂改為研究與阿茲海默症有關的遺傳問題，最終取得多個重大突破。1985年，他出任ICL聖瑪莉醫院生物化學助理教授，並在該處著手進行有關阿茲海默症的遺傳學研究，自此與神經遺傳學結下不解之緣。1989至2007年間，他先後於美國多家機構擔任要職，包括位於坦帕市的南佛羅里達大學、佛羅里達州積遜威爾市梅奧醫療中心，以及馬里蘭州貝塞斯達區的美國國家老年化研究院。

1991年，以Hardy教授為首的團隊首次發現「前類澱粉蛋白質」（APP）基因的基因變異，與家族性阿茲海默症關係密切，並在這個基礎上發表「類澱粉連鎖假說」，指出類澱粉蛋白積聚是腦細胞受損的起因。上述突變獲公認為阿茲海默症首個已知的成因，直至今天，絕大多數針對阿茲海默症的基礎科學及醫學研究，亦建基於此。

Hardy教授並未因這項驚世突破而自滿。他繼續探索誘發神經退化性疾病的遺傳因素，為研究其他相類型疾病開拓更高更廣的視野。他是國際柏金遜症基因

Parkinson Disease Genomics Consortium and part of the team which identified the tau gene in frontotemporal dementia and the synuclein triplication mutation in Parkinson's disease. He was also behind the discovery of C9orf72, regarded as the greatest genetic discovery for amyotrophic lateral sclerosis (ALS), a progressive neurodegenerative disease that affects nerve cells in the brain and the spinal cord.

Prof. Hardy published close to 900 scientific papers in top-tier journals and received numerous awards. He was the first-ever UK winner of the US$3-million 2016 Breakthrough Prize in Life Sciences, dubbed the "Oscars of science", for his pioneering research into the different forms of dementia. Prof. Hardy impressed us not only by his richly-deserved honors, but also his philanthropic spirit. He gave £50,000 from the prize money to match donations toward the construction of the UCL Dementia Research Institute that would lead efforts to find effective treatments for those with dementia.

In 2018, Prof. Hardy and three of his colleagues shared the €1-million Brain Prize, the world's biggest brain research prize, awarded by the Danish Lundbeck Foundation. The award reflected their pioneering understanding of the changes in the brain that lead to Alzheimer´s and related types of dementia. The new research results provide a good foundation for finding new ways to diagnose, treat and maybe even prevent these diseases.

The number of honors that Prof. Hardy has received is astonishing. He is a fellow of the Royal Society and a member of the Academy of Medical Sciences and the French Society of Neurology. He also received the Pritzker Prize in 2015 for his leadership in genetics research, the Dan David Prize, the AAIC Lifetime Achievement Award in Alzheimer's Disease Research, and many others.

In order to expand his knowledge of genetic risk factors for Alzheimer's, Prof. Hardy has been closely working with HKUST's faculty and is currently undertaking research collaborations to identify and characterize the genetic risk factors for Alzheimer's in the Chinese population and Parkinson's in East Asians. He is also an elected Senior Visiting Fellow at the HKUST Jockey Club Institute for Advanced Study and conducts lectures on genomics in neurodegenerative diseases. Thanks to his assistance, HKUST signed a landmark Memorandum of Understanding with renowned institutions including UCL to undertake innovative and pioneering translational neuroscience research.

組學合作同盟研究員，參與發現額顳葉認知障礙症中常見的「濤蛋白」，以及引致柏金遜症的突觸核蛋白基因的三重變異。另外，他也是發現導致肌肉萎縮性側面硬化病（ALS）的C9orf72基因的功臣之一。有關病人的腦神經細胞及脊髓神經細胞會逐漸退化；而確認C9orf72基因，實為遺傳學上破解ALS的最重大發現。

他先後在頂級學術期刊發表接近900篇科學論文，歷年來獲獎無數。2016年，憑著他對多類認知障礙症的創新研究，成為首位榮膺有「科學界奧斯卡」之稱的「生命科學突破獎」的英國學者，獎金高達300萬美元。Hardy教授屢獲殊榮，固然實至名歸，其濟世助人之心，更令人肅然起敬。他捐出其中5萬英鎊獎金作配對基金，資助UCL興建認知障礙症研究所，期望為病人尋找有效的治療方案。

2018年，Hardy教授再下一城，與三位同袍分享由丹麥倫貝克基金會頒發的「腦科研究獎金」。此獎金額高達100萬歐羅，是全球同類型獎金之冠。幾位得獎人乃是研究腦部變化如何導致阿茲海默症及相關認知障礙症的先驅，其創新的研究結果亦為研發有關疾病的診斷、醫治甚或預防方案奠定良好基礎。

Hardy教授歷來所獲的榮譽和獎項數量驚人。他不但身為英國皇家學會、英國醫學科學院及法國神經內科學會會員，憑著其在遺傳學研究的輝煌成就，於2015年更榮膺普立茲克獎 。另外，他也是「丹・大衛獎」得主，並獲阿茲海默症國際大會頒發「阿茲海默症研究終身成就獎」。

為增進對阿茲海默症患者遺傳風險因素的了解，Hardy教授與科大學者長期緊密合作，現時更在進行多項聯合研究，為中國人群阿茲海默症患者以及東亞人士柏金遜症患者的遺傳風險因素進行辨識和歸類工作。他現為香港科技大學賽馬會高等研究院資深訪問學人，不時主持有關神經退化性疾病基因組學的講座。承蒙他大力協助，科大與包括UCL在內的著名學府簽署了合作備忘錄， 就開展前沿轉化神經科學研究奠下里程碑。