Professor Timothy Barrett

Professor in Paediatrics

Reproduction, Genes and Development

Contact details

Telephone +44 (0) 121 333 9267 (tel:+44 121 333 9267)

Fax +44 (0)121 333 9272

Email t.g.barrett@bham.ac.uk (mailto:t.g.barrett@bham.ac.uk)

School of Clinical and Experimental Medicine
c/o Diabetes Unit
Birmingham Children's Hospital
Steelhouse Lane
Birmingham
B4 6NH

About

Timothy Barrett Professor of Paediatrics, Honorary Consultant in Paediatric Endocrinology and Diabetes, and Program Director for the Wellcome Trust Clinical Research Facility at Birmingham Children's Hospital.

Timothy has published over 100 research papers in scientific journals as well as reviews and book chapters in the fields of paediatrics, diabetes and genetics of childhood diabetes syndromes. He has received major grants from The Medical Research Council, The Wellcome Trust, European Union Directorate General for Health and Consumer Affairs, Diabetes UK and Wellchild.

He leads NHS national specialist commissioned services in rare diabetes syndromes, and a busy clinical practice of general diabetes, type 2 diabetes in children, and tertiary endocrinology. He is an enthusiastic teacher and communicator on the theme of childhood diabetes, and lectures widely at national and international level. Timothy contributes to the local and national media and advises the BBC on stories relating to childhood obesity and metabolism.

Qualifications

- Fellow of Royal College of Paediatrics and Child Health since 2004
- Fellow of Higher Education Academy since 2000
- PhD in human molecular genetics University of Birmingham 1996
- Member of Royal College of Physicians since 1996
- MBBS London University 1986

Biography

Timothy Barrett qualified with MB BS in medicine and surgery from The London Hospital Medical College, London University in 1986. He undertook training posts in paediatrics as Royal Devon and Exeter Hospital, Queen Elizabeth Hospital Hackney, St George's Hospital London and Great Ormond Street Hospital before gaining DCH in 1988 and MRCP (UK) in 1990. He continued his paediatric training as a registrar at Birmingham Children's Hospital and went on to study for a PhD in Genetics at University of Birmingham under Professor Sarah Bundey. The topic for his PhD was the genetics of Wolfram syndrome. He then returned to Birmingham Children's Hospital to complete higher specialist training in paediatric endocrinology and diabetes, becoming Senior Lecturer and Honorary consultant in 1998.

Timothy was awarded membership of The Royal College of Physicians in 1990, Royal College of Paediatrics and Child Health in 1998 and Fellowship in 2004. He became Reader in Paediatrics in 2004, and Professor of Paediatrics in 2006. He has been Program Director of The Wellcome Clinical Research Facility (Paediatrics) in Birmingham since 2008.

The understanding of rare childhood diabetes syndromes has been a significant theme in Timothy's research and he has led a laboratory research team embedded within Professor Eamonn Maher's molecular genetics group since 1998.

He has been a member of grant awarding panels of Diabetes UK and The Birmingham Children's Hospital Charities Research Foundation (Chair from 2001-2006). He is a reviewer for the Medical Research Council, Wellcome Trust and NIHR funding schemes.

Timothy was an expert witness for the Health Select Committee on obesity in children, 2004. He was deputy head of the Academic Department of Paediatrics from 2005-2009, and acting head in 2006. He is currently a member of the academic board of The Royal College of Paediatrics and Child Health, a member of the Medicines for Children Research Network (MCRN) Clinical Studies Group for diabetes and endocrinology, and a member of the MCRN Industry Scientific Advisory Committee.

Timothy has been program organiser for The National Paediatric Diabetes Symposium, held in Nottingham, for the last 5 years, and runs the only RCPCH accredited Advanced Practical Paediatric and Adolescent Diabetes trainees course at University of Birmingham annually since 2001.

Teaching

Undergraduate

- BMed Sci
- MBBS year 5 Paediatrics module

Postgraduate

- MRes
- Advanced Practical Paediatric and Adolescent Diabetes

Postgraduate supervision

Timothy is currently supervising two students for PhD on genetics and functional studies in rare diabetes disorders.

For any general doctoral research enquiries, please email: **dr@contacts.bham.ac.uk (mailto:dr@contacts.bham.ac.uk)** or call +44 (0)121 414 5005.

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Research

Research themes:

- Genetics and functional studies in rare diabetes syndromes
- National and International Rare disease registries
- Patient cohort in childhood type 2 diabetes
- Translational research: clinical trials in childhood diabetes; clinical experimental studies in endocrinology and metabolism.

RESEARCH ACTIVITY

Wolfram syndrome (DIDMOAD)

The main emphasis of his work over the last 17 years has been on understanding the genetics of rare diabetes syndromes, in particular Wolfram syndrome, in children and adults. This work began with a clinical characterisation study of UK families, then a genetic linkage analysis, demonstrating autosomal recessive inheritance and narrowing the candidate gene region on chromosome 4p. Once the gene was identified, he published a mutation analysis of UK patients. Key discoveries include: (i) the demonstration of autosomal recessive inheritance as opposed to mitochondrial inheritance; (ii) narrowing of the locus on chromosome 4p from 7Mb to 4Mb of DNA; (iii) definition of the mutational spectrum of the *wfs1* gene in the pathogenesis of Wolfram syndrome; (iv) functional studies demonstrating the sodium pump as a novel interacting partner. Professor Barrett's lab is part of Medical and Molecular Genetics (head, Prof Eamonn Maher), in the Institute of Biomedical Research at The Medical School in Edgbaston.

Work on other rare diabetes syndromes has included a contributions to identifying the genes for Thiamine responsive megaloblastic anaemia, diabetes and deafness; and the gene for Wolcott Rollison syndrome. Mutation analyses and clinical studies have been published for both these syndromes and for Alstrom syndrome and congenital hypopituitarism secondary to mutations in the PROP1 and PIT1 genes. The Alstrom syndrome study was the first to demonstrate insulin resistance in affected children out of proportion to the fat mass. Each of these studies led to the establishment of molecular genetic testing as NHS services (**http://www.bwhct.nhs.uk/genetics-index.htm (http://www.bwhct.nhs.uk/genetics-index.htm)**)

National and International rare disease registries

He has also been involved over the last 2 years in a Big Lottery funded study establishing a national disease registry for Alstrom syndrome. This links to national specialist NHS multidisciplinary clinics, and the registry is a bioresource of anonymised clinical data and tissue samples (skin biopsies from which human pluripotent stem cells are being derived).

In an extension to the European Union, Timothy Barrett leads a consortium setting up a European rare diseases registry for Wolfram syndrome, Alstrom syndrome and Bardet Biedl syndromes (**www.euro-wabb.org (http://www.euro-wabb.org/)**). This acts as a biorepository to gather clinical and investigation data on up to 300 affected people with each syndrome. The aim is to establish a platform for randomised controlled trials of drugs to stop or delay the progression of these diseases.

UK Patient cohort in childhood onset type 2 diabetes

He was instrumental in establishing the UK childhood type 2 diabetes cohort, which so far numbers over 100 children (**www.jump.bham.ac.uk (http://www.jump.bham.ac.uk/)**) . Clinical data and blood samples for DNA have been collected, and the cohort is acting as a resource for pharmaceutical companies to recruit patients for multinational clinical trials of new drugs. So far, the cohort is supporting recruitment to 2 academic and 2 commercial phase 2 studies.

Translational research

Professor Barrett is Program Director for The Wellcome Trust Clinical Research Facility, a paediatric satellite facility at Birmingham Children's Hospital (**http://www.bch.nhs.uk/departments/WTCRF.html (http://www.bch.nhs.uk/departments/WTCRF.html)**). There are currently 92 clinical experimental and clinical trials studies operational, crossing all the major specialties. His focus is on studies in paediatric diabetes and endocrinology. So far almost 30% of children with diabetes have been recruited into National Institute of Health Research portfolio studies over the last 5 years. In association with this, data from the National Diabetes audit has shown the measure of good diabetes control, HbA1c, has improved to 8.3%, significantly better than the national median. Endocrine studies include investigations into obesity and metabolism, including the effects of exercise in altering body composition.

Other activities

- National Specialist Commissioning service lead for Wolfram syndrome, Alstrom syndrome (children); Bardet Biedl syndrome (children; Birmingham service).
- Member NIHR MCRN Industry Scientific Advisory Committee
- Member NIHR Diabetes and Endocrinology Clinical Studies Group
- Member Academic Board RCPCH
- Chair of Trial Steering Committee and member of DMC for 2 clinical trials.

Publications

Idkowiak J, Lavery GG, Dhir V, Barrett T, Stewart PM, Krone N, Arlt W. Premature adrenarche - novel lessons from early onset androgen excess. Eur J Endocrinol. 2011 May 26.

Marshall JD, Maffei P, Beck S, Barrett TG, Paisey RB. Clinical utility gene card for: Alström syndrome. Eur J Hum Genet. 2011 Apr 27.

Cangul H, Morgan N, Forman J, Saglam H, Aycan Z, Yakut T, Gulten T, Tarim O, Bober E, Cesur Y, Kirby G, Pasha S, Karkucak M, Eren E, Cetinkaya S, Bas V, Demir K, Yuca S, Meyer E, Kendall M, Hogler W, Barrett T, Maher E. Novel TSHR mutations in consanguineous families with congenital nongoitrous hypothyroidism. Clin Endocrinol (Oxf). 2010;73:671-7

Bruce C, Smith M, Rahman F, Liu Z, McMullan D, Ball S, Hartley J, Kroos M, Heptinstall L, Reuser A, Rolfs A, Hendriksz C, Kelly D, Barrett T, MacDonald F, Maher E, Gissen P. Design and validation of a metabolic disorder resequencing microarray (BRUM1). Hum Mutat. 2010 Jul;31(7):858-65.

Marcovecchio M, Tossavainen P, Acerini C, Barrett T, Edge J, Neil A, Shield J, Widmer B, Dalton R, Dunger D. Maternal but not paternal association of ambulatory blood pressure with albumin excretion in young offspring with type 1 diabetes. Diabetes Care 2010;33:366-71

Adolescent type 1 Diabetes cardio-renal Intervention Trial Research Group. Adolescent type 1 Diabetes Cardio-renal Intervention Trial (AdDIT). BMC Pediatr. 2009 Dec 17;9:79.

Narula P, Porter L, Langton J, Rao V, Davies P, Cummins C, Kirk J, Barrett T, Protheroe S. Gastrointestinal Symptoms in Children With Type 1 Diabetes Screened for Celiac Disease. Pediatrics. 2009;124:e489-95

Marcovecchio M, Dalton R, Schwarze C, Prevost A, Neil H, Acerini C, Barrett T, Cooper J, Edge J, Shield J, Widmer B, Todd J, Dunger D. Ambulatory blood pressure measurements are related to albumin excretion and are predictive for risk of microalbuminuria in young people with type 1 diabetes. Diabetologia 2009;52:1173-81.

Expertise

Childhood disease – specifically hormone problems; diabetes, obesity and related disorders; genetics of childhood diabetes syndromes

Alternative contact number available for this expert: **contact the press office (http://www.birmingham.ac.uk/news/contacts/index.aspx)**