

Dr Kristien Boelaert MD, PhD, MRCP

MRC Clinician Scientist and Honorary Consultant Endocrinologist

Endocrinology, Diabetes and Metabolism

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About

Kristien Boelaert is a Senior MRC-funded Research Fellow and practising Consultant Endocrinologist with lead roles in the Thyroid Services at the UHB NHS Foundation Trust.

Her laboratory research interests focus on the pathogenesis of thyroid cancer and in particular on the identification of novel diagnostic and therapeutic approaches for patients with thyroid cancer and goitre. In addition, she has a wide interest in clinical and translational research including the management of thyroid dysfunction and thyroid nodules. Kristien has attracted major grant funding from the Medical Research Council, The Wellcome Trust and the British Thyroid Foundation.

Kristien heads her own research group and has a rapidly growing publication list of original research papers, reviews and book chapters in the field of molecular and clinical thyroidology. She is an enthusiastic communicator and is a regular speaker at national and international meetings. Furthermore, she is a lecturer on several Teaching Programmes within the University.

Kristien is a strong advocate of translational research and aims to build an effective bridge that enables scientific knowledge to be incorporated into the care of patients with thyroid disease.

Qualifications

- PhD, University of Birmingham 2005
- Membership of the Royal College of Physicians 1998
- MD, Catholic University Leuven, Belgium, 1995

Biography

Kristien qualified with an MD (*Summa Cum Laude*) from the Catholic University Leuven, Belgium in 1995. She emigrated to the UK and completed her basic medical training in Wolverhampton. Following achievement of the MRCP in 1998, she decided to pursue a career in Diabetes/Endocrinology. Kristien went on to study for a PhD, funded by a Wellcome Clinical Training Fellowship under supervision of Professor Jayne Franklyn. She became a Clinical Lecturer in Endocrinology in 2004 and was successful in obtaining a competitive MRC Clinician Scientist Fellowship in 2007.

Kristien's research has investigated the role of the proto-oncogene PTTG and related growth factors in thyroid tumourigenesis. This has included the development of systems through which uptake of radioactive iodine may be modulated, a number of which may translate to future therapeutic applications. In addition she has a large portfolio of translational research projects investigating the management of thyroid dysfunction and thyroid nodules.

Kristien's contribution to the field of Endocrinology was recognised by the award of Society for Endocrinology Clinical Review Lectureship in 2004 as well as by the presentation of her findings at the Annual Meeting of the Association of Physicians in 2008. Kristien's research continues to attract funding from major grant awarding bodies and is evidenced by a rapidly growing list of peer-reviewed research papers, reviews and book chapters.

She has an active teaching role within the University and is a personal mentor for MBChB students. She is a regular lecturer on various courses within the College of Medical and Dental Sciences and takes part in numerous small group teaching sessions.

Teaching

- MBChB course
- BMedSci
- Graduate Entry Course
- Intercal BMedSc Clinical Sciences Course
- MRes Endocrinology

Postgraduate supervision

- PhD supervision of 2 doctoral research students
- Supervision of postgraduate MPhil student
- Personal Mentor to medical students
- Mentor to 5 doctoral research students

- Supervision of thyroid database management

Research

RESEARCH THEMES

- Molecular pathogenesis of endocrine cancers
- Diagnosis, management and long-term consequences of thyroid dysfunction
- Investigation of novel diagnostic and therapeutic approaches in thyroid nodules and cancer

RESEARCH ACTIVITY

1. *Laboratory Research*

Kristien's laboratory research interests centre around the molecular pathogenesis of endocrine cancers in general and thyroid tumours specifically. In particular the role played by two closely related proto-oncogenes namely PTTG – the human securin - which has been implicated in the aetiology of a number of endocrine tumour types and its binding factor PBF, a proto-oncogene which we is currently being characterised in collaboration with Professor Chris McCabe.

Utilising several models of altered gene expression and function in the murine thyroid, we are currently mapping the multiple actions of PTTG and PBF in the initiation and progression of transformed cell growth. We are characterising the altered growth factor regulation apparent in thyroid hyperplasia and neoplasia, through mouse models, human primary thyroid cultures and transformed thyroid cell line investigations.

Both PTTG and PBF have been shown to reduce the function of the sodium iodide symporter which is the molecule responsible for iodide uptake in thyroid cells, a finding which has major implications for the treatment of thyroid cancers with radioactive iodine. We are in the process of developing systems through which uptake of radioiodine may be modulated in vivo, thereby exploring novel therapeutic approaches for patients with thyroid cancer.

2. *Translational Research*

Kristien continues to be involved in a number of research projects aiming to improve the management of patients with hyperthyroidism. These include projects determining the prevalence of symptoms and signs in patients with subclinical and overt hyperthyroidism, the risk of co-existing autoimmune diseases in patients with autoimmune thyroid disease, and outcomes following administration of radioactive iodine. Currently ongoing studies include the prediction of mortality in patients with hyperthyroidism according to the treatment modality used and the effects of treatment of hyperthyroidism on BMI. Current funding applications centre around the hypothesis that weight gain following treatment of hyperthyroidism may be prevented through simple interventions including dietary and lifestyle changes.

Based on findings within the laboratory Kristien is in the process of setting up a number of research projects identifying novel diagnostic and prognostic markers in patients with thyroid nodules. This includes investigations of the predictive value of serum TSH concentrations in predicting malignancy as well as the evaluation of molecular tools to aid in the distinction between benign and malignant thyroid nodules. An upcoming Visiting Clinician Fellowship at the Mayo Clinic, Rochester Minnesota will be pivotal in further expanding these research avenues.

Other activities

- Consultant Endocrinologist, University Hospital Birmingham NHS FoundationTrust
- Clinical Governance Lead for Endocrinology within UHB NHS FT

Publications

Original Research publications (8 most recent)

K Boelaert, B Torlinska, RL Holder and JA Franklyn (2010). Older subjects with hyperthyroidism present with a paucity of symptoms and signs – a large cross-sectional study. *Journal of Clinical Endocrinology and Metabolism*, 95: 2715-2726.

RJ Watkins, ML Read, VE Smith, GM Reynolds, L Buckley, G Lewy, MC Eggo, LS Loubiere, K JA Franklyn, K Boelaert and CJ McCabe (2010). PTTG Binding Factor – a New Gene in Breast Cancer *Cancer Research*, 70: 3739-3749.

K Boelaert, PR Newby, MJ Simmonds, RL Holder, JD Carr-Smith, JM Heward, A Allahabadia, M Armitage, VK Chatterjee, JH Lazarus, SHS Pearce, B Vaidya, SC Gough, and JA Franklyn (2010). Prevalence and relative risk of other autoimmune diseases in subjects with autoimmune thyroid disease. *American Journal of Medicine*, 123: 183.e1-9.

VE Smith, ML Read, A Turnell, RJ Watkins, SR James, MC Eggo, K Boelaert, JA Franklyn and CJ McCabe (2009). A novel mechanism of sodium iodide symporter repression in differentiated thyroid cancer. *Journal of Cell Science*, 122: 3393-4302.

K Boelaert, A Syed, N Manji, RL Holder, MC Sheppard, SC Gough and JA Franklyn (2009). Prediction of cure and risk of hypothyroidism in patients receiving ¹³¹I for hyperthyroidism. *Clinical Endocrinology*, 70: 129-138.

K Boelaert, VE Smith, AL Stratford, T Kogai, LA Tannahill, JC Watkinson, MC Eggo, JA Franklyn and CJ McCabe (2007). PTTG and PBF repress the human sodium iodide symporter. *Oncogene*, 26: 4344-4356.

HN Pemberton, JA Franklyn, K Boelaert, SY Chan, DS Kim, C Kim, SY Cheng, S Melmed, MD Kilby and CJ McCabe (2007). Separase, securin and Rad21 in neural cell growth. *Journal of Cellular Physiology* 2007 *Journal of Cellular Physiology*, 213: 45-53.

K Boelaert, J Horacek, RL Holder, JC Watkinson, MC Sheppard and JA Franklyn (2006). Serum thyrotropin concentration as a novel predictor of malignancy in thyroid nodules investigated by fine needle aspiration biopsy. *Journal of Clinical Endocrinology and Metabolism*, 91: 4295-4301.

Reviews

K Boelaert (2010). Thyroid gland: Revised guidelines for the management of thyroid cancer. *Nature Reviews in Endocrinology*, 6: 185-186.

K Boelaert (2010). Treatment of Graves' disease with antithyroid drugs: Current perspectives. *Thyroid*, 20: 943-946.

N Sharma, K Boelaert and JC Watkinson (2010). Who should treat thyroid cancer? A UK surgical perspective. *Clinical Oncology*, 22:413-418

K Boelaert (2009). The association between TSH and Thyroid cancer. *Endocrine Related Cancer*, 16: 1065-1072.

K Boelaert and JA Franklyn. Starling Review: Thyroid hormone in health and disease. Journal of Endocrinology, 187: 1-15.

K Boelaert and NJ Gittoes. Radiotherapy for non-functioning pituitary adenomas. European Journal of Endocrinology, 144: 569-75.

Book Chapters

K Boelaert (2010). Thyroid hormones, iodine and antithyroid drugs In Side Effects of Drugs Annual Volume 32 (in press)

K Boelaert, L Albon, and JA Franklyn (2010). Benign Thyroid Disease, In Stell and Maran's Textbook of Head and Neck Surgery and Oncology, 5th Edition (in press)

K Boelaert, JV Parle and JA Franklyn (2010). Thyroid Disease, In Endocrinology in Primary Care, pp125-165, Ed N Gittoes, National services for Health Improvement, Nuffield Press Ltd, Dartford, UK.

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