University of Birmingham

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About

Chris Tselepis is a Senior Lecturer in the School for Cancer Sciences. Chris has published in excess of 40 research articles in the field of cancer, most recently focussing on the subject of iron metabolism, obesity and gastrointestinal cancer. He has received major support from the Cancer Research UK, BBSRC, WCRF, CORE and the UHB Charities.

Chris has most recently won funding through Glaxo Smith Kline to further develop his work on iron chelation and health. His work in the field of iron chelation and cancer has led to several pending patents. These iron chelation technologies are currently being optimised further through interactions with both schools of Chemistry and Chemical Engineering. In addition he is avidly working with industrial and clinical partners to deliver early phase clinical trials to assess the usefulness of iron chelators in individuals at high risk of developing colorectal cancer.

He currently supervises several clinical research fellows and his work has now expanded to assessing the role of iron in non-gastrointestinal cancers, including endocrine cancers and also assessing how obesity in the background of iron can also contribute to carcinogenesis. These more novel studies are embracing both proteomic and metabolomic technologies afforded to us through our school.

Chris is exceptionally passionate that education goes hand in hand with research and is a major contributor to Cancer Research UK/University of Birmingham outreach activity and teaches extensively on a plethora of courses within the University including MBChB, BDS, BMedSci and GEC.

Qualifications

- PhD Biochemistry 1996
- BSc (Hons) Biochemistry 1992

Biography

Chris Tselepis qualified with a BSc (Hons) in Biochemistry from the University of Wales in 1992. He then went on to study for a PhD in Biochemistry at the prestigious Wellcome Trust Centre for Cell-Matrix research at the University of Manchester.

Upon successful completion in 1996 he pursued his interests in cell-cell adhesion and took up a post-doctoral position with Prof Garrod at the University of Manchester. At the end of this period Chris moved to the Department of Medicine at the University of Birmingham to study cell-cell adhesion in gastrointestinal cancers and was very soon promoted to a lecturer within the department.

This work lead to several seminal papers examining the role of extracellular signals in Barrett's carcinogenesis and began to solidify his interests in identifying novel mechanisms of chemoprevention.

In 2006 Chris was promoted to Senior Lecturer in the School for Cancer Sciences and pursued his interests in gastrointestinal cancer. In particular through close collaborations with Dr Tariq Iqbal (Consultant Gastroenterologists UHB) Chris's group now focuses specifically on the role of iron in carcinogenesis and has forged strong links both nationally and internationally. His work has led to the discovery of the usefulness of dietary iron chelators to treat cancer and has lead to several pending patents. Chris is currently working with both experts in the schools of Chemistry and Chemical Engineering at the University of Birmingham and has support from Industry to further develop these technologies.

In addition his most recent studies have scrutinised the role of iron and obesity as risk factors for colorectal and endocrine cancers. This work is in close collaboration with Prof McCabe, Ms Olga Tucker and Dr Tomlinson. Utilising both metabolomic tools (collaboration with Profs Gunther and Viant) we are also now beginning to reveal important therapeutic targets for the treatment of these cancers.

Alongside his research since arriving in Birmingham Chris has been heavily involved in teaching both undergraduate and post graduate students. Most pertinently he is module lead on the 'Digestive system' module which is delivered as a core MBChB module to all 400 first year medical students, in addition to deputy module coordinator for the same course delivered to BMedSci students. Since joining the University he has also successfully supervised 7 MD/PhD students.

Finally throughout his career he has participated in a host of outreach activities showcasing the work both of the University of Birmingham and Cancer Research UK.

Teaching

- **MBChB** (/undergraduate/courses/med/medicine.aspx)
  Module Coordinator for the Digestive system.
  As well as coordinating the semester long module he further teaches extensively on this course, the integrated problems course and runs both SP1 and SP2 projects
- **BDS** (/undergraduate/courses/med/dental-surgery.aspx)
  Teaches extensively in lecture and SGT format on the Digestive system
- GEC
  Teaches extensively in lecture and SGT format on the Fuels module
- **BMedSci** (/undergraduate/courses/med/medical-sci.aspx)
  Module Coordinator for the Digestive system and teaches extensively on this and other BMedSci courses

Postgraduate supervision

Since joining Birmingham Chris has successfully supervised 7 MD/PhD students and is currently supervising a further 3 students. Chris is further interested in supervising doctoral research students in the following areas:

- The role of iron and usefulness of chelation therapy in the treatment of gastrointestinal, breast and endocrine cancer
- The usefulness of dietary iron chelators as chemopreventive agents
- The role of obesity and adipose secreted factors in carcinogenesis.

If you are interesting in studying any of these subject areas please contact Chris on the contact details above, or 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.

For a full list of available Doctoral Research opportunities, please visit our Doctoral Research programme listings.

Research

Research Themes

Cancer Cell Biology, Cancer Prevention, Screening, Diagnosis & Survivorship, Structural Biology & Biomarkers, Diabetes, Obesity & Metabolism, Endocrine-related Cancer

Research Activity

Iron and Cancer
It is becoming increasingly clear that an excess of iron is associated with carcinogenesis. In particular the Tselepis group were the first to demonstrate that in the progression of both oesophageal and colorectal cancer a deregulation in a range of iron metabolism proteins. Importantly these changes culminate in increased cellular iron acquisition which in turn drives Wnt signalling; the major oncogenic signalling pathway of the intestine. This work is currently being verified in other in-vivo model systems in collaboration with Prof Sansom (Beatson Institute Glasgow). Their recent data unequivocally demonstrates that iron can indeed amplify tumour burden whilst suppression almost completely ablates its formation. Moreover, their hypothesis is that iron represents a generic carcinogen and drives all cancers and this is currently being testing in both breast cancer and also a range of endocrine cancers most notably thyroid cancer in collaboration with Prof McCabe. In addition their work is now embracing proteomic and metabolomic technologies with a view to identifying other iron stimulated pathways which impact ultimately on tumourigenesis.

Iron chelation as a platform for chemoprevention
From our ongoing studies we hypothesise that iron chelators possess potent chemopreventive properties. Thus a large aspect of the ongoing research is to identify chelators which as well as possessing potent iron chelating properties, are safe for human consumption and are non-absorbable within the gastrointestinal tract. To date several dietary agents which fulfil these criteria have been identified and these are the subject of further scrutiny, including manipulation of structure and assessing chemopreventive potential in-vivo and in-vitro model systems. In particular several of these agents are currently being worked up with a view to commencing several human clinical trials.

The role of obesity in cancer
It is clear that obesity is risk factor for developing cancer in particularly gastrointestinal cancer. However, at the molecular and cellular level how obesity influences risk is unclear. Interestingly obesity is associated with a poor functional iron status and the group is currently exploring whether this poor functional iron status is central to understanding the pathogenesis of obesity driven colorectal cancer. In addition utilising local expertise his group is also assessing which adipocyte secreted factors are important in modulating epithelial cell fate and ultimately cancer.

Other activities

In partnership with Dr Douglas Ward and Dr Tariq Iqbal pioneered and manage a hepcidin assay which is currently commercialised and run as an international service for the assessment of hepcidin both within the research and clinical context.

http://www.hepcidin.bham.ac.uk/ (http://www.hepcidin.bham.ac.uk/)

Publications

Cronin J, McAdam E, Danikas A, Tselepis C, Griffiths P, Baxter J, Thomas L, Manson J, Jenkins G. Epidermal growth factor receptor (EGFR) is overexpressed in high-grade dysplasia and adenocarcinoma of the esophagus and may represent a biomarker of histological progression in Barrett's esophagus. (2011) Am J Gastroenterol. 106:46-56.

Bryan RT, Tselepis C. Cadherin switching and bladder cancer. (2010) J Urol. 184:423-31.

Tselepis C, Ford SJ, McKie AT, Vogel W, Zoller H, Simpson RJ, Diaz Castro J, Iqbal TH, Ward DG. (2010) Characterization of the transition-metal-binding properties of hepcidin. Biochem J. 427:289-96.

Kroot JJ, Kemna EH, Bansal SS, Busbridge M, Campostrini N, Girelli D, Hider RC, Koliaraki V, Mamalaki A, Olbina G, Tomosugi N, Tselepis C, Ward DG, Ganz T, Hendriks JC, Swinkels DW. (2009) Results of the first international round robin for the quantification of urinary and plasma hepcidin assays: need for standardization. Haematologica. 94:1748-52.

Sharma N, Begum J, Eksteen B, Elagib A, Brookes M, Cooper BT, Tselepis C, Iqbal TH. (2009) Differential ferritin expression is associated with iron deficiency in coeliac disease. Eur J Gastroenterol Hepatol. 21:794-804.

Ward DG, Roberts K, Stonelake P, Goon P, Zampronio CG, Martin A, Johnson PJ, Iqbal T, Tselepis C. (2008) SELDI-TOF-MS determination of hepcidin in clinical samples using stable isotope labelled hepcidin as an internal standard. Proteome Sci. 6:28.

Oesophageal adenocarcinoma is associated with a deregulation in the MYC/MAX/MAD network. (2008) Boult JK, Tanière P, Hallissey MT, Campbell MJ, Tselepis C. Br J Cancer 98:1985-92.

Brookes MJ, Boult J, Roberts K, Cooper BT, Hotchin NA, Matthews G, Iqbal T, Tselepis C. (2008) A role for iron in Wnt signalling. Oncogene 27:966-75.