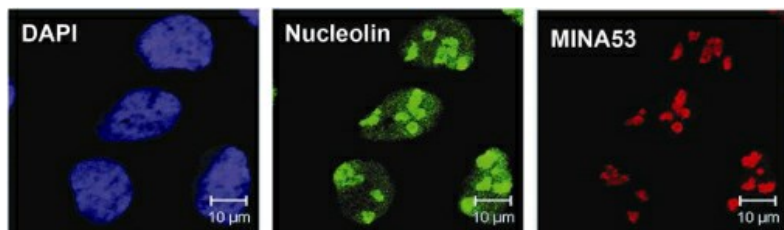


Oxygenases and Cancer

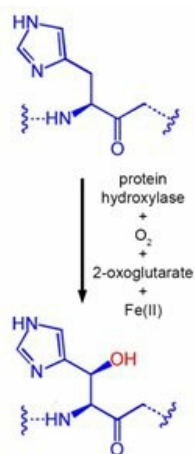


Group Leader: [Dr Mathew Coleman \(staff/profiles/cancer/coleman-matthew.aspx\)](http://staff/profiles/cancer/coleman-matthew.aspx)

Group Overview

Modification of proteins alters their function and allows cells to control critical processes such as cell growth and death. Inappropriate control of these modifications is a hallmark of several major diseases, including cancer. Our group studies proteins modified by oxygen, a process termed 'hydroxylation', and aims to understand how deregulated hydroxylation contributes to cancer.

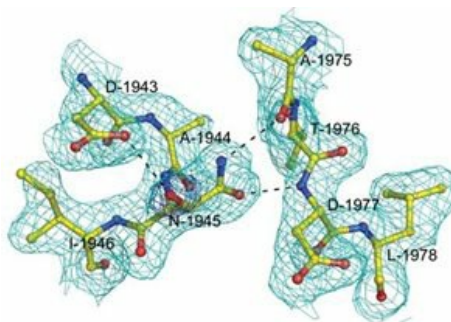
Our Research Group



Our group aims to explore the role of a novel family of enzymes known as '2-oxoglutarate oxygenases' in cancer. These enzymes depend on 2-oxoglutarate (2OG), oxygen and Fe(II) to catalyse oxidative modifications such as hydroxylation and demethylation. 2OG-oxygenases have been linked to cancer following their known involvement in hypoxia signalling and epigenetic regulation, and their altered expression, amplification and mutation observed in cancer genetics programs.

We have shown that a sub-set of 2OG-oxygenases hydroxylate substrates involved in the control of protein synthesis, including ribosomal proteins Rpl27a and Rpl8. Interestingly, the expression of these enzymes is deregulated in multiple tumour types. Since aberrant protein synthesis and translational control are critical features of cancer development and progression, our group aims to understand how regulation of protein translation by hydroxylation may contribute to tumourigenesis.

Our research on 2OG-oxygenases in cancer involves a multi-disciplinary approach that includes in vitro biochemical assays (interaction and enzyme modification assays, crystallography), gene knockout and RNA interference in tumour cell lines, and model organisms. In order to achieve this breadth of research we collaborate with several UK and international groups including Professor's Peter Ratcliffe, Christopher Schofield, Xin Lu, Benedikt Kessler and Adrian Harris (Oxford), Professor Anne Willis (Leicester), Associate Professor Mark Bix (Memphis), Dr Stephen Renshaw (Sheffield), Dr Marion Schmidt-Zachmann (Heidelberg) and Dr Elena Alkalaeva and Professor Ludmila Frolova (Moscow).



Recent publications...

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Staff members...

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Dr Mathew Coleman (</staff/profiles/cancer/coleman-matthew.aspx>)

Post-doctoral researchers

Dr Qinqin Zhuang

We always welcome enquiries from talented researchers interested in our work.

Research Associate

Dr Helen Smith

Students

Charlotte Eaton (PhD)

Athanasios Ploumakis (PhD)

Penny Feng (PhD, Oxford)

Sumayya Iqbal (Intern)

Naseeb Malhi (MRes)

Hasaam Uldin (medical student)

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