Curriculum vitae – Malcolm F. White FRSE

Current Position

Professor of Biochemistry, Biomedical Sciences Research Complex, School of Biology, University of St Andrews, Scotland.

Career

2014-2017	Head of School of Biology, University of St Andrews.
2007-2013	Director of Research, School of Biology, University of St Andrews.
2004-2017	Professor of Biochemistry, University of St Andrews.
2001-2004	Royal Society URF & Reader, School of Biology, University of St Andrews.
2000-2001	Royal Society URF & Lecturer, School of Chemistry, University of St Andrews.
1997-2000	Royal Society URF, Department of Biochemistry, University of Dundee.
1995-1996	Cancer Research Campaign Postdoctoral Fellow, with Professor David Lilley *FRS*. Department of Biochemistry, University of Dundee.
1993-1994	Fulbright Visiting Research Fellow, with Professor Jack F. Kirsch. M.C.B. Department, University of California, Berkeley.
1990-1992	Research Fellow, with Dr Linda Gilmore. Department of Biochemistry, University of Edinburgh.

Education

1982–1986	BSc Hons Biochemistry 1st Class, University of Aberdeen.
1986–1990	PhD Biochemistry, University of Edinburgh.

Recognition / Awards

2014	Royal Society Wolfson Research Merit Award
2010	Elected to the European Molecular Biology Organisation (EMBO)
2010	Appointed Deputy Chair of the Biochemical Journal
2008	Joined Editorial Board of the Biochemical Journal
2008	Elected to Royal Society of Edinburgh
2007	Appointment to BBSRC BMS grant panel (2008-10)
2004	Joined Faculty of 1000
2004	Promotion to Professor
2001	Promotion to Reader
1996	Royal Society University Research Fellowship
1992	Fullbright Visiting Research Fellowship

Summary of research activity

136 journal publications, 8 book chapters. (ORCID ID 0000-0003-1543-9342)
H – index 51 (Google Scholar); 44 (Scopus)
>£11.9 M in grant awards as Biology PI

Research

I lead a group in the inter-disciplinary Biomedical Sciences Research Complex at St Andrews University. My research expertise lies in the use of techniques in biochemistry, enzymology, molecular biology, proteomics, bioinformatics, biophysics and microbiology to identify and study proteins that interact with nucleic acids. Our primary area of interest is the CRISPR system for adaptive antiviral defence in prokaryotes, where we have focused on the Type III effector complexes, cyclic oligoadenylate signalling and adaptation. We are also interested in DNA repair mechanisms in the archaea and in humans.

Leadership Roles

2007-2013 Director of Research, School of Biology

Responsible for research management and strategy, and in particular the Biology submissions to the Research Excellence Framework (REF) in 2014. I coordinated the Biology REF submission and wrote the documentation. This included the development of six impact case studies for REF2014 all rated as 4* - world leading. I took a leading role in developing, researching and writing all six impact case studies. St Andrews Biology had the second highest score for impact in the UK, and each 4* case study is estimated to bring in ~£500k through REG (Research Excellence Grant) funding from SFC. I set up and coordinated teams of academics to read and score all potential REF papers, modelled the submission, and selected papers for REF. Our REF performance lead to an increase in REG funding to Biology of ~£400k per annum, against a backdrop of reduced funding.

2014-2017 Head of School of Biology

As HoS I was line manager for ~70 academics and responsible for a school with an annual turnover of ~£20M – about 10% of the University total. The School is spread over six building and 3 interdisciplinary research centres. One of my first acts was to introduce a comprehensive workload model for the school, which is widely supported by staff as it improves transparency and perceptions of fairness. In 2016 the School achieved a ranking of 1st in student satisfaction (NSS) for both biochemistry and zoology. Overall league table success has included a historically high ranking of 2nd in the UK in the 2018 Guardian University Guide. We were awarded an Athena Swan Bronze award in 2014 and a Silver award in Nov 2017.

Professional Contribution

2019-2021	Member of the "Cell and Molecular Biology" committee of the RSE
2018	Review Panel Member for German Research Foundation DFG Priority Programme
2017	Editorial Board member of "The CRISPR Journal"
2016	Designated "outstanding referee" for Nature Journals
2010-2015	Deputy Chair of the Biochemical Journal
2009-2010	Pool member for the BBSRC research grant panels
2008-2009	Member of the Biomolecular Sciences committee of the BBSRC
2008-2010	Editorial Board of the Biochemical Journal
2008-2011	Member of the "Cell and Molecular Biology" committee of the RSE
2006-2009	Member of the Society for General Microbiology Prokaryote Division
2005-2007	Editorial advisory board of the journal Molecular Microbiology
2004-2008	Contributing member of the Faculty of 1000 Biology (by invitation)
2004-2008	Member of the *Genes* Theme panel of the Biochemical Society

Selected recent papers as corresponding author

* joint corresponding authors

Cyclic oligoadenylate signalling mediates Mycobacterium tuberculosis CRISPR defence Grüschow S, Athukoralage JS, Graham S, Hoogeboom T and White MF (2019) **BioRxiv** 667758.

Ring nucleases deactivate type III CRISPR ribonucleases by degrading cyclic oligoadenylate Athukoralage JS, Rouillon C, Graham S, Grüschow S and White MF (2018) **Nature** 562, 277-280.

Control of cyclic oligoadenylate synthesis in a type III CRISPR system Rouillon C, Athukoralage JS, Graham S, Grüschow S and White MF (2018) **eLife** 7:e36734.

Prespacer processing and specific integration in a Type I-A CRISPR system Rollie C, Graham S, Rouillon C and White MF (2018) **Nucleic Acids Res**. 46, 1007-1020. (designated "Breakthrough Article" top 3%)

Mechanism of DNA loading by the DNA Repair helicase XPD Constantinescu Aruxandei D, Petrovic-Stojanovska B, Penedo JC, White MF* and Naismith JH* (2016) **Nucleic Acids Res** 44, 2806-2815.

Intrinsic sequence specificity of the Cas1 integrase directs new spacer acquisition Rollie C, Schneider S, Brinkmann AS, Bolt EL and White MF (2015) **eLife** 10.755/eLife.08716.

Cas6 specificity and CRISPR RNA loading in a complex CRISPR-Cas system Sokolowski RD, Graham S and White MF (2014) **Nucleic Acids Res.** 42, 6532-41.

Structure of the CRISPR Interference Complex CSM reveals key similarities with Cascade Rouillon C, Zhou M, Zhang J, Politis A, Beilsten-Edmands V, Cannone G, Graham S, Robinson CV*, Spagnolo L* and White MF* (2013) **Mol. Cell** 52, 124-134.

Structure and mechanism of the CMR complex for CRISPR-mediated antiviral immunity Zhang J, Rouillon C, Kerou M, Reeks J, Brugger K, Graham S, Reimann J, Cannone G, Liu H, Albers SV, Naismith JH, Spagnolo L* and White MF* (2012), **Mol. Cell**, 45, 303-313. PMID: 22227115.

Displacement of the canonical single stranded DNA binding protein in the thermoproteales Paytubi S, McMahon SA, Graham S, Liu H, Botting CH, Makarova KS, Koonin EV, Naismith JH* and White MF* (2011) **Proc. Natl. Acad. Sci. USA**, 109, E398-405.

Structural and functional characterization of an archaeal CASCADE complex for CRISPR-mediated viral defense Lintner NG, Kerou M, Brumfield SK, Graham S, Liu H, Naismith JH, Sdano M, Peng N, She Q, Copie V, Young MJ, White MF* and Lawrence CM* (2011) **J. Biol. Chem.** 286, 21643-21656

The DNA repair helicase XPD unwinds bubble structures and is not stalled by extrahelical DNA lesions Rudolf J, Rouillon C, Schwarz-Linek U and White MF (2010) **Nucleic Acids Res.** 38, 931-941.

PCNA stimulates catalysis by structure specific nucleases using two distinct mechanisms: substrate targeting and catalytic step Hutton, RD, Roberts JA, Penedo JC* and White MF* (2008) **Nucleic Acids Res**. 36, 6720-6727.

Structure of the DNA repair helicase XPD Liu H, Rudolf, J, Johnson KA, McMahon SA, Oke M, Carter L, McRobbie A-M, Brown SE, Naismith JH* and White MF* (2008) **Cell**, 133, 801-812.

Single-stranded DNA-binding protein hSSB1 is critical for genomic stability Richard DJ, Bolderson E, Cubeddu L, Wadsworth RIM, Savage K, Sharma GG, Nicolette ML, Tsvetanov S, McIlwraith MJ, Pandita RK, Takeda S, Hay RT, Gautier J, Paull TT, Pandita TK, White MF* and Khanna, KK* (2008) **Nature** 453, 677-682.

Structure of the DNA repair helicase Hel308 reveals DNA binding and autoinhibitory domains J.D. Richards, K.A. Johnson, H. Liu, A-M McRobbie, S. McMahon, M. Oke, L. Carter, J.H. Naismith* and M.F. White* (2008) **J. Biol. Chem.** 283, 5118-5126.

Current Grant Awards as PI

BBSRC Project Grant – *Nucleotide Excision Repair: lighting up a dark pathway*, 08/18-12/21, £510k.
BBSRC Project Grant – *Cyclic oligoadenylate signalling, a new type of antiviral response*, 01/19-12/21, £460k.

Patents

1. UK Patent Application No. 1902256.5: Novel Enzyme for phage therapy. Filed 19/2/2019
2. PCT/AU2008/000181: NOVEL HUMAN ssDNA BINDING PROTEINS AND METHODS OF CANCER DIAGNOSIS. Inventors Khanna, Richard & White. Filed 07/03/2008.

Service to the University

04/17 – 07/20	Member of Science Faculty Promotions Committee
04/16 – 02/17	Member of working group on Teaching and Academic Careers
06/14 – 07-17	Head of the School of Biology
06/14 – 07/17	Member of Academic Council
09/06 – 12/13	Biology Director of Research (covering RAE2008 and REF2014)
09/06 – 07/17	School of Biology Management Committee
05/09 – 07/17	BSRC Management Committee
09/06 – 12/13	University Research Forum
10/07 – 12/13	University Chemical and Biological Hazards sub-committee
09/05 – 12/13	School of Biology Research Committee
10/05 – 09/06	Coordinator of Biology BBSRC DTG award,
10/05 – 09/06	School of Biology Postgraduate Committee