

JOHN A. MCRAE

Dr. John Alexander McRae, M.A. (Queen's), Ph.D., D.Sc. (Manchester), LL.D. (Queen's), F.R.I.C., F.R.S.C., was Head of the Department of Chemistry from 1941 to 1956 and member of the chemistry staff for 44 years. After retiring, Dr. McRae was Emeritus Professor of Chemistry until his death in 1960.

Dr. McRae graduated from Queen's University with an M.A. in 1909 and joined the University as a lecturer this same year. From 1910 to 1911, he was a lecturer at the University of Toronto, returning to Queen's the following year. With the exception of the years 1919-1921, during which he attended Manchester University to obtain his Ph.D. and D.Sc., he carried out the remainder of his career at Queen's.

John McRae was elected a Fellow of the Royal Society of Chemistry in 1938 and was a fellow of the Royal Institute of Chemistry and of the Chemical Institute of Canada. After retiring in 1956, Dr. McRae was honoured with a degree of Doctor of Laws from Queen's.

The McRae memorial lectures were established by donations from former students, with the first J.A. McRae Memorial lecture being given by R.H.F. Manske in 1964.

SELECTED RECENT PUBLICATIONS

- J. L. Jeffrey, J. A. Terrett, D. W. C. MacMillan "O-H Hydrogen bonding promotes H-atom transfer from a C-H bonds for C-alkylation of alcohols" *Science*, 349, 1523-1536 (2015)
- J. Jin, D. W. C. MacMillan "Alcohols as alkylating agents in heteroarene C-H functionalization" *Nature*, 525, 87-90 (2015)
- J. A. Terrett, J. D. Cuthbertson, V. W. Shurtleff, D. W. C. MacMillan "Switching on elusive organometallic mechanisms with photoredox catalysis" *Nature*, 524, 330-334 (2015)
- C. C. Le, D. W. C. MacMillan "Fragment Couplings via CO₂ Extrusion-Recombination: Expansion of a Classic Bond-Forming Strategy via Metallaphotoredox" *JACS*, 137, 11938-11941 (2015)
- C. C. Nawrat, C. R. Jamison, Y. Slutskyy, D. W. C. MacMillan, L. E. Overman "Oxalates as Activating Groups for Alcohols in Visible Light Photoredox Catalysis: Formation of Quaternary Centers by Redox-Neutral Fragment Coupling" *JACS*, 137, 11270-11273 (2015)
- E. R. Welin, A. A. Warkentin, J. C. Conrad, D. W. C. MacMillan "Enantioselective α -Alkylation of Aldehydes by Photoredox Organocatalysis: Rapid Access to Pharmacophore Fragments from β -Cyanoaldehydes" *Angew. Chem. Int. Ed.*, 54, 9668-9672 (2015)
- J. Jeffrey, F. R. Petronijevic, D. W. C. MacMillan "Selective Radical-Radical Cross-Couplings: Design of a Formal β -Mannich Reaction" *J. Am. Chem. Soc.*, 137, 8404-8407 (2015)



Department of Chemistry Queen's University

is honoured to host the
2015 McRae Lecturer:

Prof. David W.C. MacMillan, FRS
James S. McDonnell Distinguished
University Professor of Chemistry

Princeton University



"The Development of New
Photoredox Reactions"

Friday, December 4, 2015
11:30 AM
Room 117, Chernoff Hall

PROFESSOR DAVID MACMILLAN



David W.C. MacMillan, FRS

**James S. McDonnell Distinguished University Professor
of Chemistry**

**Princeton University
Merck Center for Catalysis
Princeton, NJ**

Professor David MacMillan was born in Bellshill, Scotland and received his undergraduate degree in chemistry at the University of Glasgow before beginning his doctoral studies with Professor Larry Overman at the University of California, Irvine. After graduate work developing enantioselective methodology and carrying out total syntheses, MacMillan moved to Harvard University as a postdoctoral fellow with Professor David Evans. In the Evans lab, he studied enantioselective catalysis with chiral Lewis acids.

MacMillan began his independent research career at the University of California, Berkeley in 1998 and moved to the California Institute of Technology in June of 2000. In 2004, he was appointed as the Earle C. Anthony Professor of Chemistry at Caltech. He moved to Princeton University in September 2006 as the A. Barton Hepburn Professor of Chemistry and Director of the Merck Center for Catalysis. He became Chair of the Department in 2010 and since 2011 has been James S. McDonnell Distinguished University Professor. He has served on numerous editorial and scientific advisory boards and is a consultant for most of the major pharmaceutical companies.

Professor MacMillan's research is broadly characterized as challenging accepted norms and has resulted in significant changes in the way people do science. He was a pioneer in the area of asymmetric organocatalysis at a time when enzymes and metals were thought to be the only effective choices for these transformations. He has since started a second field, that of photoredox catalysis, an area that has rapidly evolved to become one of the most exciting areas in organic chemistry.

SELECTED HONOURS & AWARDS

- **2015** Ernst Schering Prize
- **2015** Cliff S. Hamilton Award
- **2014** Harrison Howe Award
- **2012** Elected Fellow of the Royal Society
- **2012** Elected member of the American Academy of Arts and Sciences
- **2011** ACS Award for Creative Work in Synthetic Organic Chemistry
- **2011** Mitsui Award in Catalysis
- **2007** Mukaiyama Award
- **2007** ISHC Award in Heterocyclic Chemistry
- **2007** ACS Cope Scholar Award
- **2006** Thieme-IUPAC Prize in Organic Synthesis
- **2005** Elias J. Corey Award for Outstanding Contribution in Organic Synthesis by a Young Investigator
- **2005** Tetrahedron Young Investigator Award
- **2005** Corday-Morgan Medal
- **2003** Camille and Henry Dreyfus Teacher-Scholar Award
- **2002** Sloan Fellowship
- **2002** Bristol-Meyers Squibb Award for Organic Synthesis
- **2002** Pfizer Award for Excellence in Synthesis
- **2001** Eli-Lilly Grantee Award
- **2001** GlaxoSmithKline Chemistry Scholar Award