David MacMillan

David William Cross MacMillan FRS FRSE (born 16 March 1968)[1] is a Scottish[2][3][4][5][6][7] chemist and the James S. McDonnell Distinguished University Professor of Chemistry at Princeton University, where he was also the Chair of the Department of Chemistry from 2010 to 2015.[8][9] He shared the 2021 Nobel Prize in Chemistry with Benjamin List "for the development of asymmetric organocatalysis".[10]

Contents

David MacMillan FRS FRSE	
Born	David William Cross MacMillan 16 March 1968 Bellshill, Scotland, UK
Citizenship	U.K., U.S.
Education	University of Glasgow (BSc) University of California, Irvine (MSc, PhD)
Awards	Corday-Morgan medal Member of the National Academy of Sciences (2018) Nobel Prize in Chemistry (2021)
Scientific career	
Institutions	Princeton University California Institute of Technology University of California, Irvine University of California, Berkeley Harvard University
Thesis	*Stereocontrolled formation of bicyclic tetrahydrofurans*

Education and early life

MacMillan was born in Bellshill, Scotland in 1968 and grew in nearby New Stevenston.[11] He received his undergraduate degree in chemistry at the University of Glasgow, where he worked with Ernie Colvin.[12][13]

In 1990, he left the UK to begin his doctoral studies under the direction of Professor Larry Overman at the University of California, Irvine. During this time, he focused on the development of new reaction methodology directed toward the stereocontrolled formation of bicyclic tetrahydrofurans. MacMillan's graduate studies culminated in the total synthesis of 7-(−)-deacetoxyalcyonin acetate, a eunicellin diterpenoid isolated from the soft coral *Eunicella stricta*.[14] He earned his Ph.D. in 1996.[13]

He hailed his Scottish upbringing as a reason for him winning the Nobel.[11]

Career and research

Upon receiving his Ph.D., MacMillan accepted a position with Professor David Evans at Harvard University. His postdoctoral studies centered on enantioselective catalysis, in particular, the

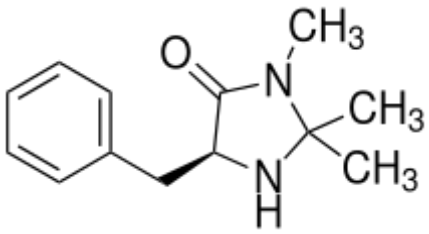
design and development of Sn(II)-derived bisoxazoline complexes (Sn(II)box).[13]

MacMillan began his independent research career as a member of the chemistry faculty at the University of California, Berkeley in July 1998. He joined the department of chemistry at Caltech in June 2000, where his group's research interests centered on new approaches to enantioselective catalysis. In 2004, he was appointed as the Earle C. Anthony Professor of Chemistry. He became the James S. McDonnell Distinguished University Professor at Princeton University in September 2006.[13]

He is considered to be one of the founders of organocatalysis.[15] In 2000, MacMillan designed small organic molecules that can provide or accept electrons and therefore efficiently catalyse reactions.[15][16] He developed catalysts that can drive asymmetric catalysis, in which a reaction produces more of the left-handed version of a molecule than the right-handed one, or vice versa.[15] MacMillan's research group has made many advances in the field of asymmetric organocatalysis, and they have applied these new methods to the synthesis of a range of complex natural products.[13][15] He developed chiral imidazolidinone catalysts.[17][16][18] MacMillan catalysts are used in various asymmetric syntheses. Examples include Diels-Alder reactions,[16] 1,3-dipolar cycloadditions,[19] Friedel-Crafts alkylations[20] or Michael additions.[18]

Between 2010 and 2014, MacMillan was the founding Editor-in-Chief of the journal *Chemical Science*, the flagship general chemistry journal published by the Royal Society of Chemistry.[13]

	and Enantioselective total synthesis of eunicellin diterpenes (https://www.proquest.com/docview/304225710/) (1996)
Doctoral advisor	Larry E. Overman
Other academic advisors	Ernest W. Colvin David A. Evans
Doctoral students	Vy Dong, Tehshik Yoon, Tristan Lambert
Website	Official website (http://chemlabs.princeton.edu/macmillan)



First generation MacMillan catalyst

Honours and awards

- 2002 Sloan Research Fellowship[21]
- 2004 Corday-Morgan medal of Royal Institute of Chemistry[22]
- 2012 Elected a Fellow of the Royal Society (FRS)[23]
- 2012 Elected as a member of the American Academy of Arts and Sciences[24]
- 2013 Elected a Corresponding Fellow of the Royal Society of Edinburgh (FRSE)[25]
- 2015 Harrison Howe Award[26]
- 2017 Ryoji Noyori Prize[27]
- 2018 Elected a member of the National Academy of Sciences[13]
- 2021 Nobel Prize in Chemistry[10]

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External links

- David MacMillan (https://www.nobelprize.org/laureate/1003) on Nobelprize.org