

IRISH SOCIETY FOR IMMUNOLOGY

PUBLIC LECTURE AWARD – 27TH APRIL 2017



The ISI are pleased to announce that **Professor Andrew Bowie** (School of Biochemistry and Immunology, Trinity Biomedical Sciences Institute, TCD) is the 2017 recipient of their Public Lecture Award, which will be hosted on 27th April in association with the Irish Times.

Prof. Bowie will present his public lecture entitled:

"Viruses and us: playing host to the enemy"

In his lecture, Prof. Bowie will discuss the fascinating relationship between us and viruses – how viruses invade our cells, how our cells are equipped to detect and thwart such an invasion, and why the same cellular anti-viral detectors that protect us from these invaders can also cause damage, chronic inflammation and autoimmunity.

This public lecture will take place in the Tercentenary Hall,
Floor 2, Trinity Biomedical Sciences Institute, 152-160 Pearse Street, Dublin 2.
at 7.00 pm on Thursday, 27th April 2017.

(Doors will open for the event from 6.30pm and no pre-booking of tickets is required)

This lecture will also mark part of the ISI's contribution to the
European Day of Immunology 2017

BIOGRAPHY

Professor Andrew G. Bowie, PhD, FTCD, MRIA
School of Biochemistry and Immunology, Trinity Biomedical Sciences Institute,
Trinity College Dublin.

Summary

Andrew Bowie obtained his PhD in Biochemistry from Trinity College Dublin in 1997. He was elected a Fellow of TCD in 2008, and a member of the Royal Irish Academy in 2014. He is currently Head of Immunology in the School of Biochemistry and Immunology, TCD.

His main research interests are pathogen detection and innate immune signalling, and how such detection processes are subverted by viruses. Work in his laboratory has shed light on how pattern recognition receptors (PRRs) recognise pathogens, leading to the induction of interferons and cytokines, which control infection locally as well as coordinating the adaptive immune response. He also investigates how PRRs and inflammasomes drive inflammation through the recognition of nucleic acid such as mislocalised self-DNA.

His seminal discoveries in these areas have redefined our understanding of how viruses engage with human cells, and he has regularly published research papers, opinion pieces and reviews in leading international journals including *Nature Immunology*, *Immunity*, *The Journal of Experimental Medicine*, *Nature Reviews Immunology* and *The EMBO Journal*. In particular, he is interested in how the immune system responds to foreign and self DNA, and discovered one of the key cellular sensors of DNA in 2010, which has subsequently been shown to be critical in understanding viral pathogenesis of diverse viruses including HIV and herpes viruses.

He has recently identified novel roles for a number of innate immune proteins in regulating inflammation via cytokine modulation, and is currently exploring their mechanisms of action.

Publications

Prof. Bowie's research discoveries and scholarly activities have significantly contributed to TCD's global reputation as a place of excellence for Immunology teaching and research. During his Ph.D. he wrote an opinion piece in *Biochemical Pharmacology* (Bowie and O'Neill, 2000: 59, 13-23) where he presented some of the implications of his PhD findings. This article, published in 2000, continues to attract regular new citations (cited over 800 times to date).

During his postdoctoral research in 2000, he was the first to show that viruses could inhibit Toll-like receptor (TLR) function (Bowie et al, *Proc. Natl. Acad. Sci. USA*. 97, 10162-10167 (455 citations)), a discovery that was recognised by a Commentary in PNAS by one of the 'Fathers' of innate immunity, Prof. Charles Janeway (Janeway and Medzhitov, 2000, *Proc. Natl. Acad. Sci. USA* 97, 10682). This discovery predicted that TLRs would have an important role in sensing viruses, which indeed turned out to be true: TLRs 1, 2, 3, 4, 6, 7, 8, 9 and 13 have all subsequently been shown to participate in viral detection.

As a PI since 2001, he continued researching how viruses subvert detection by innate immunity, leading to papers in *The Journal of Experimental Medicine* in 2003 (Harte et al, 197, 343-351 (347 citations)) and in 2005 (Stack et al, 201, 1007-1018 (329 citations)). Further key papers in this field that he published from 2005 - 2015 appeared in *The Journal of Biological Chemistry*, *The Journal of Immunology*, *The Journal of Virology* and in *PLoS Pathogens*.

As well as discovering how viruses *evade* innate immunity, he contributed significant conceptual advances to our understanding of how viruses are *detected* by innate immunity. In 2006, he published a paper in *Nature Immunology* showing for the first time that an ancient evolutionary conserved protein termed SARM has an important regulatory role in mammalian innate immunity (Carty et al, 7, 1074-1081 (446 citations)). This was the first demonstration of a role for mammalian SARM, and was accompanied by a 'News and Views' article in the journal.

He was also the first to show that the protein DDX3 is involved in viral detection, leading to interferon induction in a study published in *The EMBO Journal* (220 citations*). He discovered in 2010 that IFI16 was a cellular sensor of viral DNA

and mis-localised. This paper published in *Nature Immunology* (Unterholzner et al, 11, 997-1005) was chosen as ‘Article of the Month’, was accompanied by a News and Views piece highlighting its significance, and has been cited 762 times. Many research groups have subsequently shown the importance of IFI16 in anti-herpesvirus innate immunity, and IFI16 has also been implicated in sensing of HIV-1.

Contribution to Immunology teaching

Prof. Bowie established the first and only Immunology undergraduate degree course in Ireland (in TCD in 2002), and was course coordinator from 2002 – 2006. Has graduated 14 PhD students. He is currently Head of Discipline for Immunology.

Selected career highlights

- Publications: >13,000 citations, h-index 48 (Google Scholar).
- Peer-reviewer for all major Immunology journals, and for grant agencies including the European Research Council (ERC).
- 1999: Sheldon Wolff Prize in Cytokine Research (International Cytokine Society).
- 2001-present: Secured grants totalling circa €9m from Irish, European and American grant agencies.
- 2006-present: Editorial Board Member of *Biochemical Pharmacology*.
- 2008: Elected Fellow of Trinity College Dublin.
- 2010-2014: Associate Editor for *The Journal of Immunology*.
- 2013-2015: Editor for *The Biochemical Journal*.
- 2014: Elected to the Royal Irish Academy (RIA).
- 2015-present: Editorial Board of *The Journal of Biological Chemistry*.
- 2017-present: Board of Reviewing Editors, *Science Signaling*.
- 2017: Awarded the Irish Society for Immunology (ISI) Public Lecture Award (PLA) Medal for outstanding contribution to Irish Immunology.