



Marjory Stephenson Prize Lecture Nomination Form

Awarded annually to an individual who has made an outstanding contribution to the discipline of microbiology

The Marjory Stephenson Prize Lecture award is a competitive process. Please complete all sections of the form below and attach a copy of the requested supporting documentation required by the rules of the award – see the Microbiology Society website for details: www.microbiologysociety.org/prizelectures.

The Microbiology Society supports [Equality and Diversity](#) and asks that those making nominations consider the entire talent pool available.

We appreciate the time and effort it takes to complete a final nomination so please note: whilst recipients of prizes cannot be nominated again for the same prize, unsuccessful nominations can be resubmitted with amendments for one more round the following year.

1. Nominee

I wish to nominate:

Name Professor Gordon Dougan

[redacted]

Address

Email [redacted]

Subject area Medical and molecular bacteriology

2. Nomination information

(a) Distinction of candidate's work and contribution to microbiology. If appropriate, please suggest others who might be able to comment authoritatively.

This section should include but is not limited to significant discoveries in the candidate's field, invention or development of new tools and technologies and evidence of great originality or foresight. Max 300 words.

Professor Gordon Dougan's career spans five decades with his first work published in 1977. Now, over 500 publications later, his contribution and passion to his field of microbiology can be observed in its entirety. Gordon 'Doog' Dougan's research hasn't developed into the application of game-changing technologies to solve problems, rather, his research started with generating such pioneering technologies. He was the first to generate multivalent live salmonella vaccine strains through rational attenuation and genetic engineering, over 40 years ago. This work led to the development of vaccine candidates for numerous diseases both bacterial and viral. His move from industry to academia in the early 90's saw Gordon continue his vaccine development work but also saw him as a driving force, along with collaborators at the then Sanger Institute, in unravelling the genome sequences of several pathogens of global concern. These included the genomes of Plague (*Yersinia pestis*), Salmonellae and *Clostridium difficile* to name but a few. The avenues of further research that these papers led to, by

Gordon's team and others across the globe, cannot be overstated.

The collaborative work conducted by Gordon at Imperial College London eventually led him to move to the Wellcome Trust Sanger Institute. There, Gordon cultivated research with the mouse genetics team. This led to the game-changing avenue of using high throughput mutagenesis of mouse embryonic stem cells to identify host genes involved in immune function against pathogens and toxins. Findings from these studies were paradigm changing in terms of both technological advances and basic understanding of the biology of infectious disease. In parallel, Gordon harnessed the increasing power of next generation sequencing to tackle another branch of investigation into bacterial pathogens, epidemiology. This current research is at the fore of helping society to understand the spread of some of the world's most problematic pathogens.

(b) Describe the impact or potential impact of the candidate's work.

Please describe how the nominee's work has influenced their field and the across the breadth of microbiology. Please also whether there has been any, or there is the potential for a translational aspect to her or his work in industry, policy or in the wider society. Max 300 words.

Professor Dougan's approach of 'rational attenuation' generated bacterial strains that were both probes of immunity practical vaccine candidates. He organized the first human typhoid vaccine studies carried out in the UK for many years (performed at the Common Cold Unit in Salisbury) and has continued to pursue the development of a single dose oral typhoid vaccine. Despite many setbacks (due to lack of industrial funding for this neglected disease) a strain constructed in his laboratory completed a successful Phase IIb study in infants in Vietnam.

He exploited these strains as vectors for the delivery of heterologous antigens to the immune system and as probes of basic immune responses. His return to work on pathogenic *E. coli* quickly blossomed. Working together with Rino Rappuoli he proved that the adjuvant property of *E. coli* Heat labile toxin was not dependent on toxicity, opening up possible routes to their exploitation as mucosal adjuvants and immunogen. He developed a scheme based on sub-types of the protein intimin that is now used in EPEC diagnosis and classification and identified the first Type III secretion needles in *E. coli*. He elegantly pioneered the exploitation of *Citrobacter rodentium* as an *in vivo* model to investigate enteric infection and the relationship with inflammatory bowel disease.

Separately, Gordon and his team characterised pertactin of *Bordatella pertussis* both molecularly and immunologically. It went on to be a key antigen in the acellular whooping cough vaccines used around the world. Underpinning Gordon's research is his dedication to delivering improved vaccines for the developing world, especially those designed to boost the immune response of the mucous membranes that line the gastrointestinal tract. His peers recognised his leadership in research and clinical trials when, in 2014, they named him amongst the top ten most influential people in the vaccine field.

(c) Any other comments or information you feel relevant to the nomination

An example might be a contribution to the Society, in public engagement or education. Max 300 words.

Throughout his career Gordon has served as a referee, advisor and consultant for numerous respected institutions, universities, boards, committees and other organizations. He was a Trustee of the International Vaccine Institute in Korea and has worked with other global agencies including the World Health Organisation and Gavi, The Vaccine Alliance. He was elected a Fellow of the Academy of Medical Sciences (UK) in 2002. He is a member of EMBO and was elected Fellow of the Royal Society in 2012. He worked for over ten years in industry developing vaccines and novel drugs at an internationally renowned multinational company (The Wellcome Foundation/GSK). He has participated in early and late clinical studies on several antibacterial approaches. He was Chair of the Novartis Vaccines & Diagnostics SAB and has been involved in founding and advising new companies. He currently sits on the board of The Hilleman laboratories, a joint venture between Wellcome and Merck. He has founded several companies including VHSquared, a recent joint venture between Unilever and The Wellcome Trust and Microbiotica. He is currently an 'Expert in Residence' at The Wellcome Trust, advising them on vaccine strategy and drug resistant infections. He has published over 500 research papers (many in high impact journals), edited several books and has sat on the editorial boards of a number of prestigious journals.

He has served The Microbiology Society at several levels including Section Leader and Journal Editor. He has presented at multiple meetings and is the only scientist to have won both the Fleming and Colworth Lecturer awards. Moreover his contribution to early career researchers is and always has been impeccable. Gordon has been a key speaker at the Microbiology Society's Forums where he actively engages in his role at these sessions.

3. Concise CV

Please ask the nominee to provide a concise CV to supplement this application. The CV should include publications and work relevant to the Prize, and also a statement acknowledging understanding of the rules of the award scheme – see [here](#).

CV attached

4. Nominator(s)

I confirm that I am a Member of the Microbiology Society (*please put 'X' in box to confirm*).

Nominated by:

Name Stephen Michell Email [redacted]

Date 6th June 2018

Seconded by:

Name Gillian Douce Email [redacted]

Date 6th June 2018