# Professor John Hermon-Taylor

Division of Diabetes and Nutritional Sciences
Franklin-Wilkins Building King's College London SE1 9NH UK


# Curriculum Vitae

## Present Appointment

- Founder - Crohn's MAP Vaccine
- Visiting Professor - King's College London

## Degrees and Diplomas

| | | |
|---|---|---|
| BA (Hons) 2[1] | Natural Sciences, Cambridge University | 1957 |
| MB,BChir | Cambridge University | 1960 |
| FRCS | Royal College of Surgeons of England | 1963 |
| MChir | Cambridge University | 1968 |

## Surgical Appointments

SHO, Surgical Registrar, University Lecturer and Senior Surgical Registrar posts 1961-1968. 60/61 The London Hospital Whitechapel; 62/63 Bethnal Green Hospital; 63/64 The Brompton Hospital Fulham Road; 64 Royal National Orthopedic Hospital Stanmore; 65 Surgical Unit The London Hospital; 66 Queen Mary's Hospital Stratford; 67 The London Hospital. Then Medical Research Council Travelling Fellow to the Department of Gastrointestinal Physiology Mayo Clinic USA 1968-69. Senior Lecturer/Honorary Consultant to the London Hospital and Medical College 1970-71. Reader in Surgery, The London Hospital and Medical College 1971-76. Professor and Chairman of Surgery St.George's Hospital Medical School and Honorary Consultant Surgeon, St George's Hospital 1976-2002. Professor Emeritus 2002-present. Visiting Professor King's College London 2008-present.

## Other Professional and Scientific Appointments

Council of the Association of Surgeons of Great Britain and Ireland 1980-1983. Director James IV Association of Surgeons 1983-1986. Governing Council of St. George's Hospital Medical School 1977-1980, 1981-84, 1990-93 and 1996-1997. Visiting Professor, Mayo Clinic, USA.1980 and 1985. Pearce-Gould Visiting Professor Middlesex Hospital 1982. Visiting Professor Pakistan Institute of Medical Sciences, Islamabad 1989. Clinical Panel, The Wellcome Trust 1985-1988. Home Office Assessor, Animals Scientific Procedures Act 1986. International Scientific Review Committee Ludwig Institute for Cancer Research, Melbourne, Australia 1987. Council, Action Research 1988-1997. Civilian Consultant Advisor in Surgery to the Royal Navy 1989-2002. Scientific Committee, British Digestive Foundation 1991-1993. Scientific Committee. CICRA Crohn's in Childhood Research Association 1993-1998. Health Services Research & Clinical Epidemiology Advisory Committee, the Wellcome Trust 1996-2001. Working Group on Paratuberculosis and Crohn's Disease: Advisory Committee on Animal Health and Welfare. European Commission 1998-2000.

## Fields of Special Clinical Interest

- Gastrointestinal surgery.
- The care of people with Crohn's disease.

## Awards

- Shepherd-Churchill Open Major Entrance Scholarship to Harrow School.
- St. John's College Cambridge Travelling Scholarship to the USA.
- Open Entrance Scholarship to The London Hospital Medical College.
- Undergraduate Prizes in Pathology, Medicine, Gynaecology and Obstetrics, London Hospital Medical College.
- Hallett Prize, Royal College of Surgeons of England.
- Hutchison Prize for original research, The London Hospital Medical College.
- Medical Research Council Travelling Fellowship to the Mayo Clinic U.S.A.
- The Times Newspaper and Barclays Bank "Innovator of the Year" Award 1988.

## Principal Societies

- American Society of Microbiology.
- American Gastroenterology Association.
- British Society of Gastroenterology.
- Formerly: British Society of Cell Biology and Biochemical Society and others in which I had a major interest for many years.

## Field of Specialist Research Interest

Diseases of animals and humans caused by exposure to the multi-host pathogen Mycobacterium Avium Subspecies Paratuberculosis (MAP).

## Current Research at King's College London

- Progress towards the GMP manufacture and clinical trial of ChAdOx2.HAVprime/MVA.HAVboost therapeutic T-cell vaccination in people with Crohn's disease.
- Development and clinical trial of a simple quantitative clinically applicable diagnostic for MAP infection in humans.

## Milestones in MAP Research

| | |
|---|---|
| 1979 | At St George's Hospital Medical School, London; establishment of a laboratory of molecular biology in the Department of Surgery. |
| 1985 | Discovery of a DNA repetitive element subsequently designated IS900, in 3 long term cultures of CD tissues developed by Dr Rod Chiodini. |
| 1988 | DNA sequencing led to the full GC-rich sequence of IS900. Since MAP from humans was extremely difficult to culture a specific DNA (PCR) Test was made to reveal the presence of MAP. |
| 1990 | DNA tests showed that most people with CD were infected with MAP. |
| 1992 | People with severe CD were treated with drug combinations including rifabutin and clarithromycin to which antibiotic resistant organisms similar to MAP were known to be more sensitive. Attenuation of MAP infection could lead to healing of CD. |
| 1990-95 | Live MAP identified in retail pasteurised milk from supermarkets throughout the South of England |
| 1995 | A low GC DNA element was discovered in MAP containing 6 genes for the biosynthesis, derivatisation and transport of fucose to the microbial surface. Since a surface fucose layer is common in cells and 'good' gut bacteria in the gut lining, this new element enabled MAP to be a 'wolf-in-sheeps-clothing'. It also provided a conceptual basis for the extreme robustness of the ZN negative form of MAP in humans. |
| 1997 | The decision to make a modern Virally vectored anti-MAP vaccine; gene selection and construction of the HAV Vaccine core. |
| 2000 | With a 5 year MRC/NERC award 'Special Initiative in Environment and Health' together with Prof. Roger Pickup at the Centre for Ecology & Hydrology and the University of Lancaster. Confirmation of MAP infection in 90% of people with CD using PCR (polymerase chain reaction) with verification by amplicon sequencing. Use Amoebae to capture and retain MAP from extracts of CD gut.<br><br>Environment work studying MAP in lakes, sedimentary cores, the rivers Taff and Towey, water treatment plants and domestic water systems. This provided an understanding of the seriousness of environmental contamination, the persistence of these robust pathogens and the widespread nature of opportunities for human exposure including in aerosols. |
| 2001 | Collaboration with Prof. Sarah Gilbert at the University of Oxford and Jenner Vaccine Institute. Optimisation of viral vectors for the MAP vaccine and completion of the first form of the vaccine comprising hAd5.HAV/MVA.HAV. |
| 2005 | prime/boost 'HAV' vaccination was safe, potent and effective in treatment and prevention of MAP infection in mice. |
| 2008 | At King's College London. Design and development of a simple quantitative clinical diagnostic for MAP. |
| 2009 | Modification of the HAV anti-MAP vaccine core to remove a short sequence so nothing matches anything in humans. |
| 2013 | A 3 year BBSRC multicentre study led by Dr Tim Bull at St George's shows hAd5.HAV/MVA.HAV vaccination to be safe, potent and highly effective against MAP infection in calves. |
| 2014 | A new priming vector ChAdOx2 developed by scientists at the Jenner Institute, Oxford University is adopted for human clinical trials. Process development for the ultra pure GMP manufacture of ChAdOx2.HAV for humans. |

## Funding the MAP Vaccine

The majority of the money to make and develop the core of the MAP vaccine has come from small private Trusts and donations from people with Crohn's disease and their families without which the present promising anti-MAP vaccination treatment for CD and the new clinical diagnostic for MAP would not exist.

## Publications in the MAP and Crohn's Disease Field


52.* Hermon-Taylor J. Mycobacterium avium subspecies paratuberculosis, Crohn's disease and the Doomsday scenario. Gut Pathog. 2009 Jul 14; 1(1):15.

51. Bull TJ, Linedale R, Hinds J, Hermon-Taylor J. A rhodanine agent active against non-replicating intracellular Mycobacterium avium subspecies paratuberculosis. Gut Pathog. 2009 Dec 23; 1(1):25.

50. Hermon-Taylor J. Gut pathogens: invaders and turncoats in a complex cosmos. Gut Pathog. 2009 Feb 3;1(1):3.

49.* Bull TJ, Gilbert SC, Sridhar S, Linedale R, Dierkes N, Sidi-Boumedine K, Hermon-Taylor J. A novel multi-antigen virally vectored vaccine against Mycobacterium avium subsp. paratuberculosis. PLoS One. 2007 Nov 28; 2(11):e1229.

48.* Scanu AM, Bull TJ, Cannas S, Sanderson JD, Sechi LA, Dettori G, Zanetti S, Hermon-Taylor J. Mycobacterium avium subspecies paratuberculosis infection in cases of Irritable Bowel Syndrome and comparison with Crohn's disease and Johne's disease: common neural and immune pathogenicities. J Clin Microbiol 2007: 45:3883-3890.

47.* Pickup, R. W., Rhodes, G., Bull, T.J., Arnott, S., Sidi-Boumedine, K., Hurley, M., Hermon-Taylor, J. Mycobacterium avium subspecies paratuberculosis in lake catchments, in river water sourced for domestic supply and in effluent from domestic sewage treatment works: diverse opportunities for environmental cycling and human exposure. Appl. Environ. Microbiol 2006; 72:4067-77.

46.* Mura M, Bull TJ, Evans H, Sidi-Boumedine K, McMinn L, Rhodes G, Pickup R, Hermon-Taylor J. Replication and long-term persistence of bovine and human strains of Mycobacterium avium subsp. paratuberculosis within Acanthamoeba polyphaga. Appl Environ Microbiol. 2006; 72:854-9.

45.* Pickup RW, Rhodes G, Arnott S, Sidi-Boumedine K, Bull TJ, Weightman A, Hurley M, Hermon-Taylor J. Mycobacterium avium subsp. paratuberculosis in the catchment area and water of the River Taff in South Wales, United Kingdom, and its potential relationship to clustering of Crohn's disease cases in the city of Cardiff. Appl Environ Microbiol 2005; 71:2130-9.

44. Cheng J, Bull TJ, Dalton P, Cen S, Finlayson C, Hermon-Taylor J. Mycobacterium avium subspecies paratuberculosis in the inflamed gut tissues of patients with Crohn's disease in China and its potential relationship to the consumption of cow's milk: a preliminary study. World J Microbiol Biotechnol 2005; 21:1175-79.

43. Hermon-Taylor J and El-Zaatari FAK. The Mycobacterium avium subspecies paratuberculosis problem and its relation to the causation of Crohn disease. In: Pedley S, Bartram J, Rees G, Dufour A, Cotruvo JA, editors. Pathogenic Mycobacteria in Water: A Guide to Public Health Consequences, Monitoring and Management. London, IWA Publishing, 2004:74-94.

42.* Bull TJ, McMinn EJ, Sidi-Boumedine K, Skull A, Durkin D, Neild P, Rhodes G, Pickup R, Hermon-Taylor J. Detection and verification of Mycobacterium avium subsp. paratuberculosis in fresh ileocolonic mucosal biopsy specimens from individuals with and without Crohn's disease. J Clin Microbiol 2003; 41:2915-23.

41. Bull TJ, Sidi-Boumedine K, McMinn EJ, Stevenson K, Pickup R, Hermon-Taylor J. Mycobacterial interspersed repetitive units (MIRU) differentiate Mycobacterium avium subspecies paratuberculosis from other species of the Mycobacterium avium complex. Mol Cell Probes 2003; 17:157-64.

40. Sheridan JM, Bull TJ, Hermon-Taylor J. Use of bioinformatics to predict a function for the GS element in Mycobacterium avium subspecies paratuberculosis. J Mol Microbiol Biotechnol. 2003; 5:57-66.

39. Hermon-Taylor J. Treatment with drugs active against Mycobacterium avium subspecies paratuberculosis can heal Crohn's disease: more evidence for a neglected public health tragedy. Dig Liver Dis. 2002; 34:9-12.

38. Hermon-Taylor J, Bull TJ. Crohn's disease caused by Mycobacterium avium subspecies paratuberculosis: a public health tragedy whose resolution is long overdue. J Med Microbiol 2002; 51:3-6.

37. Hermon-Taylor J. Bull TJ, Sumar N, Sheridan J, Cheng J, Stellakis M. The causation of Crohn's disease by Mycobacterium avium subsp.paratuberculosis. Canadian J.Gasterenterol 2000; 14:521-539.

36. Bull TJ, Hermon-Taylor J, Pavlik I I, El-Zaatari F, Tizard M. Characterization of IS900 loci in Mycobacterium avium subsp. paratuberculosis and development of multiplex PCR typing. Microbiology 2000; 146:2185-97.

35. Bull TJ, Sheridan JM, Martin H, Sumar N, Tizard M, Hermon-Taylor J. Further studies on the GS element. A novel mycobacterial insertion sequence (IS1612), inserted into an acetylase gene (mpa) in Mycobacterium avium subsp. silvaticum but not in Mycobacterium avium subsp. paratuberculosis. Vet Microbiol 2000; 77:453-63.

34.* Tizard M, Bull T, Millar D, Doran T, Martin H, Sumar N, Ford J, Hermon-Taylor J. A low G+C content genetic island in Mycobacterium avium subsp. paratuberculosis and M. avium subsp. silvaticum with homologous genes in Mycobacterium tuberculosis. Microbiology 1998; 144:3413-23.

33. Hermon-Taylor J, Barnes N. Clarke C, Findlayson C. Mycobacterium paratuberculosis cervical lymphadenitis followed five years later by terminal ileitis similar to Crohn's disease. Br.Med.J. 1998; 316:449-453.

32.* Gui GP, Thomas PR, Tizard ML, Lake J, Sanderson JD, Hermon-Taylor J. Two-year-outcomes analysis of Crohn's disease treated with rifabutin and macrolide antibiotics. J Antimicrob Chemother 1997; 39:393-400.

31. Doran T, Tizard M, Millar D, Ford J, Sumar N, Loughlin M, Hermon-Taylor J. Targeting of translation initiation signals in Mycobacterium paratuberculosis by IS900 facilitates expression of its hed gene. Microbiology 1996; 147: 547-553.

30.* Millar D, Ford J, Sanderson J, Withey S, Tizard M, Doran T, Hermon-Taylor J. IS900 PCR to detect Mycobacterium paratuberculosis in retail supplies of whole pasteurized cows' milk in England and Wales. Appl Environ Microbiol 1996; 62:3446-52.

29. Millar D, Withey SJ, Tizard MLV, Ford J, Hermon-Taylor J. Solid-Phase Hybridization Capture of Low-Abundance Target DNA Sequences: Application to the Polymerase Chain Reaction Detection of Mycobacterium paratuberculosis and Mycobacterium avium subsp. silvaticum. Analytical Biochem. 1996; 226: 325-330.

28. Hermon-Taylor J. Causation of Crohn's disease: the impact of clusters. Gastroenterology 1993;104;643-6.

## Publications in the MAP and Crohn's Disease Field cont...


29. Millar D, Withey SJ, Tizard MLV, Ford J, Hermon-Taylor J. Solid-Phase Hybridization Capture of Low-Abundance Target DNA Sequences: Application to the Polymerase Chain Reaction Detection of Mycobacterium paratuberculosis and Mycobacterium avium subsp. silvaticum. Analytical Biochem. 1996; 226: 325-330.
28. Hermon-Taylor J. Causation of Crohn's disease: the impact of clusters. Gastroenterology 1993;104;643-6.
27.* Sanderson JD, Moss MT, Tizard ML, Hermon-Taylor J. Mycobacterium paratuberculosis DNA in Crohn's disease tissue. Gut 1992; 33:890-6.
26. Moss MT, Malik ZP, Tizard MLV, Green EP, Sanderson JD, Hermon-Taylor J. IS902, an insertion element of the chronic-enteritis-causing Mycobacterium avium subsp.silvaticum. J.Gen.Microbiol. 1992; 138:139-145.
25. Moss, M.T., Sanderson, J.D., Tizard, M.L.V., Hermon-Taylor, J., El-Zaatari, F.A.K., Markesich, D.C, Graham D.Y. PCR detection of Mycobacterium paratuberculosis in long term cultures from Crohn's disease tissues. Gut 1992; 33: 1209-1213.
24. Tizard, M.L.V., Moss, M.T., Sanderson, J.D., Austen, B.M., Hermon-Taylor, J. p43 the protein product of the atypical insertion sequence IS900 is expressed in Mycobacterium paratuberculosis. J.Gen. Micro. 1992; 138:1729-36.
23. Moss, M.T., Green, E.P., Tizard, M.L., Malik, Z.P, Hermon-Taylor J. Specific detection of Mycobacterium paratuberculosis by DNA hybridization with a fragment of the insertion element IS900. Gut 1991; 32:395-398.
22. Hermon-Taylor, J., Moss, M., Tizard M., Malik, S., Sanderson, J. Molecular biology of Crohn's disease mycobacteria. Bailliere's Clinical Gastroenterology 1990; 4:23-42.
21. Vary, P.H., Andersen, P.R., Green, E., Hermon-Taylor, J. & McFadden, J.J. Use of Highly specific DNA probes and the polymerase chain reaction to detect Mycobacterium paratuberculosis in Johne's disease. J Clin Microbiol. 1990; 28: 933-937.
20.* Green EP, Tizard ML, Moss MT, Thompson J, Winterbourne DJ, McFadden JJ, Hermon-Taylor J. Sequence and characteristics of IS900, an insertion element identified in a human Crohn's disease isolate of Mycobacterium paratuberculosis. Nucleic Acids Res 1989; 17:9063-73.
19. Hampson, S.J., Portaels F, Thompson, J., Green, E.P., Moss, M.T., Hermon-Taylor, J., and McFadden, J.J. DNA probes demonstrate a single highly conserved strain of Mycobacterium avium infecting AIDS patients. Lancet 1989; 1(8629):65-8.
18. Hampson, S.J., Parker, M.C., Saverymuttu, S.H., Joseph, A.E., McFadden, J.J, Hermon-Taylor, J. Quadruple antimycobacterial chemotherapy in Crohn's disease: results at 9 months of a pilot study in 20 patients. Aliment Pharmacol Therap. 1989; 3:343-352.
17. Green, E.P., Moss, M.T, Hermon-Taylor, J. Insertion Elements in Mycobacteria. Acta Leprologica 1989; 7:239-242.
16. Visuvanathan S., Moss, M.T., Stanford, J.L., Hermon-Taylor, J. & McFadden, J.J. Simple enzymic method for isolation of DNA from diverse bacteria. J.Microbiol.Methods 1989; 10: 59-64.
15. Hampson, S.J., McFadden, J.J., and Hermon-Taylor J. Mycobacteria and Crohn's disease. Gut 1988; 29:1017-19.
14. McFadden, J.J., Thompson J., Hull E., Hampson S., Stanford J , Hermon-Taylor J. The use of cloned DNA probes to examine organisms isolated from Crohn's disease tissue. In: MacDermott R.P. ed. Inflammatory Bowel Disease: Current status and future approach. Elsevier Science Publishers 1988, 515-520.
13. Butcher PD, McFadden JJ, Hermon-Taylor J. Investigation of mycobacteria in Crohn's disease tissue by Southern blotting and DNA hybridisation with cloned mycobacterial genomic DNA probes from a Crohn's disease isolated mycobacteria. Gut. 1988; 29:1222-8.
12. McFadden JJ, Butcher PD, Thompson J, Chiodini R, Hermon-Taylor J. The use of DNA probes identifying restriction-fragment-length polymorphisms to examine the Mycobacterium avium complex. Mol Microbiol. 1987; 1:283-91.
11. McFadden J.J., Butcher P.D., Chiodini R.J. and Hermon-Taylor J. Determination of Genome Size and DNA homology between an unclassified Mycobacterium Species Isolated from patients with Crohn's disease and other mycobacteria. J.Gen.Microbiol. 1987; 133: 211-214.
10.* McFadden JJ, Butcher PD, Chiodini R, Hermon-Taylor J. Crohn's disease-isolated mycobacteria are identical to Mycobacterium paratuberculosis as determined by DNA probes that distinguish between mycobacterial species. J Clin Microbiol 1987; 25:796-801.
9. Butcher, P.D., McFadden J.J. and Hermon-Taylor J. Electrophoretic analysis of low molecular weight nucleic acids from Crohn's disease tissue. Arch.Virol. 1986; 88:113-120.
8. Butcher PD, McFadden JJ, Murray AM, Hermon-Taylor J. Immunoprecipitation of antigen-associated 32P-labelled nucleic acids from Crohn's disease mesenteric lymph nodes. Br J Exp Pathol. 1985; 66:679-87.
7. McFadden JJ, Butcher PD, Winterbourne DJ, Hermon-Taylor J. No evidence for increased incidence of common cellular antigens recognized by Crohn's disease antisera. J Clin Lab Immunol. 1985; 18:87-90.
6. Butcher, P.D., Strange C.M., McFadden J.J. and Hermon-Taylor J. Comparison of human low molecular weight RNA from normal and Crohn's disease derived blood and mesenteric lymph node Biochem.Soc.Trans 1984;12:1112-3.
5. Hermon-Taylor J. A new look at Crohn's disease. The Practioner 1983; 227: 563-68.
4. Rang EH, Brooke BN, Hermon-Taylor J. Association of Ulcerative Colitis with multiple sclerosis. Lancet. 1982; 4; 2(8297):555
3. Phillpotts RJ, Hermon-Taylor J, Teich NM, Brooke BN. A search for persistent virus infection in Crohn's disease. Gut. 1980; 21:202-7.
2. Phillpotts RJ, Hermon-Taylor J, Brooke BN. Virus isolation studies in Crohn's disease: a negative report. Gut 1979; 20:1057-62.
1. Phillpotts RJ, Weston-Underwood J, Brooke BN, Hermon-Taylor J. Immune-electron microscopy of stool specimens from patients with Crohn's disease. Lancet 1977; 1(8023):1213.

*major steps forward


## Best of the other 76 Original Papers

Grant DA and Hermon-Taylor J. The purification of human enterokinase by affinity chromatography and immunoadsorption. Some observations on its molecular characteristics and comparisons with the pig enzyme. Biochem J. 1976; 155:243-54.