

BIOGRAPHICAL SKETCH

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NAME: Parcels, Mark S.

eRA COMMONS USER NAME (credential, e.g., agency login): MParcells

POSITION TITLE: Professor, Molecular Virology

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Delaware, Newark DE	B.A.	06/1984	Biological Sciences
University of Delaware, Newark DE	Ph.D.	06/1994	Biological Sciences
University of Delaware, Newark DE	Postdoctoral	11/1996	Molecular Virology

A. Personal Statement

My role in the current proposal is to direct and participate in all aspects of the proposed work. My expertise in the study of Marek's disease from the generation of recombinant viruses, examination of specific gene products, to vaccine development, testing and immune functional analysis. I have over 25 years of experience or working with MDV, from it's genomic DNA to cell culture infections, cell line establishment, pathogenicity characterization, and immune responses to infection. Specific expertise areas are detailed in 1 – 3, below.

B. Positions and Honors**Positions and Employment**

1984 - 1985 DuPont Company, Glasgow site, Immunodiagnostics (contract technician)
 1985 - 1987 DuPont Company, Glenolden site, Immunopharmacology and signal transduction of IL-1 β
 1987 – 1989 DuPont Company, Experimental Station, Development of a blood test for HIV-1 and -2
 1989 – 1994 University of Delaware, Graduate Research Assistant, Dept. of Biology
 1994 – 1996 University of Delaware, Post-doctoral Associate/Independent Researcher, Dept. of Animal Science and Agricultural Biochemistry
 1996 – 2001 University of Arkansas, Assistant Professor, Dept. of Poultry Science
 2001 – 2004 University of Arkansas, Associate Professor, Dept. of Poultry Science, Cell and Molecular Biology Faculty
 2004 – 2010 University of Delaware, Associate Professor, Dept. of Animal and Food Sciences, Dept. of Biological Science (Joint Appt.)
 2010 –> University of Delaware, Professor, Dept. of Animal and Food Sciences, Professor, Dept. of Biological Sciences

Other Experience and Professional Memberships**Memberships**

1992 – 2004 American Association for the Advancement of Science
 1992 – 2004 American Society of Microbiology
 1997 – 2004 Poultry Science Association
 2004 - present American Association of Avian Pathologists

Advisory Boards

1998 – 2002 Institutional Biosafety Committee, BIOMUNE, INC.

2014 – present Arkion Life Sciences, LLC, Newcastle, DE
2012 – present Global Advisory Board, Bayer Animal Health, Mannheim, Germany
2012 – present Poultry Advisory Board, Bayer Animal Health, Shawnee Mission, KS

Editorial Boards

2002 – present Medical Science Monitor
2004 – present Avian Diseases
2008 – present Poultry Science
2014 – present BMC-Genomics

Grant Panel Service

1998 USDA-NRI, CGP
2003 – 2005 USDA-NRI, CGP
2007 – 2009 NSF – Ecology of Infectious Diseases
2014 – 2015 NIFA-AFRI

Peer Review (Journals)

Avian Diseases, Avian Pathology, BMC-Genomics, BMC-Veterinary Research, Cell, Gene, J. Clinical Microbiology, J. Gen. Virology, J. Infectious Diseases, J. Virology, Medical Science Monitor, PLoS-ONE, PLoS – Pathogen, PNAS – USA, Poultry Science, Veterinary Microbiology, Veterinary Research, Virology, Virology J., Virus Genes

Honors

2002, 2004 University of Arkansas, Undergraduate Student Mentoring Award
2002 Hyline International Research Award
2004 Keynote Address, 5th International Symposium on Marek's Disease, St. Catherine's College, Oxford University, UK
2004 Presidential Citation, Distinguished Alumnus, University of Delaware
2007 Jozsef Marek Award, Hungarian Academy of Sciences, Veterinary Medical Research Institute, Balatonfürad, Hungary
2007 Jozsef Marek Centennial Lecture, 15th Annual Derzsy Napok, Lake Balaton, Hungary 2007
2008 Invited Speaker, 6th International Symposium on Marek's Disease, James Cook University, Townsville, Australia
2012 Session chair, 7th International Symposium on Marek's Disease, Berlin, Germany
2016 Session chair, 8th International Symposium on Marek's Disease and Avian Herpesviruses, Tours, France

C. Contributions to Science

1. **Generation of First Oncogenic Recombinant Marek's Disease Virus.** I have published seminal papers on the genetic analysis of Marek's disease through constructing the first recombinant MDVs that retained oncogenicity. Prior to this time, all recombinants were constructed using attenuated, cell-culture adapted, MDV strains. By generating these recombinants, we, and others have been able to functionally characterize the genes encoded by MDV as they relate to host-virus interactions such as pathogenicity, oncogenicity and immune evasion. Using this genetic approach, we were able to characterize the functions of several MDV genes important to replication and pathogenicity.
 - a. **Parcells, MS**, Anderson, AS, and Morgan, RW. 1995. Retention of oncogenicity by a Marek's disease virus lacking six unique short region genes. J Virol. 69:7888-98.
 - b. Anderson, AS, **Parcells, MS**, and Morgan RW. 1998. The glycoprotein D (US6) homolog is not essential for oncogenicity or horizontal transmission of Marek's disease virus. J. Virol. 72:2548-53.
 - c. Dienglewicz RL, **Parcells MS**. 1999. Establishment of a lymphoblastoid cell line using a mutant MDV containing a green fluorescent protein expression cassette. Acta Virol. 43:106-12
 - d. **Parcells, MS**, Lin SF, Dienglewicz, RL, Majerciak, V, Robinson, DR, Chen HC, Wu Z, Dubyak GR, Brunovskis, P, Hunt HD, and Kung, HJ. 2001. Marek's disease virus (MDV) encodes an interleukin-8 homolog (vIL8): characterization of the vIL-8 protein and a vIL-8 deletion mutant MDV. J. Virol. 75:5159-73

- e. Hunt, HD, Lupiani B, Miller MM, Gimeno I, Lee LF, and **Parcells MS**. 2001. Marek's disease virus down-regulates surface expression of MHC (B complex) Class I (BF) glycoproteins during active, but not latent, infection of chicken cells. *Virology* 282:198-205.
 - f. Trapp S, **Parcells MS**, Kamil JP, Schumacher D, Tischer BK, Kumar PM, Nair, VK, and Osterrieder N. 2006. A virus-encoded telomerase RNA promotes T cell lymphomagenesis. *J. Exp. Med.* 203: 1307-17.
2. **Evolution of MDV Virulence.** My laboratory was the first to identify mutations in the principal oncogene of MDV, *meq*, that correlated with the evolution of field strains of higher virulence in the US. In addition, we identified a mutation in the signal peptide of glycoprotein L, that has been apparently selected via the use of vaccines in hosts of a particular MHC-I haplotype (B²¹), common to commercial breeds of chickens.
- a. Shamblin, C.E., N. Greene, V. Arumugaswami, R. L. Dienglewicz, and **M. S. Parcells**. 2004. Comparative Analysis of Marek's Disease Virus (MDV) Glycoprotein-, Lytic Antigen pp38- and Transformation Antigen Meq-encoding Genes: Association of Meq Mutations with MDVs of High Virulence. *Vet. Microbiol.* **102**:147-167.
 - b. Santin, E. , C.E. Shamblin, J. T. Prigge, V. Arumugaswami, R. L. Dienglewicz and **M.S. Parcells**. 2006. Examination of a Naturally-occurring Mutation in Glycoprotein L (gL) on Marek's Disease Virus Pathogenesis. *Avian Dis.* **50**:96-103.
 - c. Tavlarides-Hontz, P., P. M. Kumar, J. R. Amortegui, N. Osterrieder, and **M. S. Parcells**. 2009. A deletion within glycoprotein L of Marek's disease virus (MDV) field isolates correlates with a decrease in bivalent MDV vaccine efficacy in contact-exposed chickens. *Avian Dis.*53:287-296.
 - d. Shaikh, S. A. R., U. K. Katneni, H. Dong, S. Gaddamanugu, P. Tavlarides-Hontz, K. W. Jarosinski, N. Osterrieder, and **M. S. Parcells**. 2013. A Deletion in the Glycoprotein L (gL) Gene of U.S. Marek's Disease Virus (MDV) Field Strains Is Insufficient to Confer Increased Pathogenicity to the Bacterial Artificial Chromosome (BAC)-Based Strain, RB-1B. *Avian Dis* 57:509-18.
 - e. Morgan R, Anderson A, Bernberg E, Kamboj S, Huang E, Lagasse G, Isaacs G, Parcells M, Meyers BC, Green PJ, Burnside J. Sequence conservation and differential expression of Marek's disease virus microRNAs. 2008. *J Virol.* 82:12213-20
 - e. Padhi, A. and **M.S. Parcells**. 2016. Positive Selection Drives Rapid Evolution of the *meq* Oncogene of Marek's Disease Virus. *PLoS-ONE* (embargo until 9/23/16)
3. **Functional Analysis of the Meq Oncoprotein of MDV.** A main focus of my laboratory has been on the oncoprotein of MDV, *meq*, and it's splice variants. Meq is a basic leucine zipper protein (bZIP) that is expressed from an unspliced mRNA during early virus replication in vivo, but is expressed as unspliced and splice variant-derived forms during latency and the transformation of T-cells. We have identified changes in mobility associated with these splice variant-derived forms, which have increased affinity for the C-terminal binding protein (CtBP-1) and cell cycle/apoptosis regulatory protein, Bmi-1. The significance of this work is that similar pathways have been identified in Epstein-Barr Virus (EBV)-associated malignancies, and hence, MDV appears to be a very tractable model for Hodgkin's lymphoma.
- a. Anobile JM, Arumugaswami V, Downs D, Czymbek K, **Parcells MS** and Schmidt C. 2006. Nuclear localization and dynamic properties of the Marek's disease virus oncogene products Meq and Meq/vL8. *J. Virol.* 80:1160-6.
 - b. Levy AM, Izumiya Y, Brunovskis P, Xia L, **Parcells MS**, Reddy SM, Lee LF, Chen HW, Kung HJ. 2003. Characterization of the chromosomal binding sites and dimerization partners of the viral oncoprotein Meq in Marek's disease virus-transformed T cells. *J. Virol.* 77:12841-51.
 - c. Burgess SC, Young JR, Baaten BJ, Hunt L, Ross LN, **Parcells MS**, Kumar PM, Tregaskes CA, Lee LF, and Davison TF. 2004. Marek's disease is a natural model for lymphomas overexpressing Hodgkin's disease antigen (CD30). *Proc. Natl. Acad. Sci USA* 101: 13879-84.

Complete List of Published Work in MyBibliography (NCBI):

<http://www.ncbi.nlm.nih.gov/sites/myncbi/mark.parcells.1/bibliography/50113607/public/?sort=date&direction=ascending>