

## BIOGRAPHICAL SKETCH

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NAME Mark S. Parcels	POSITION TITLE Professor, Molecular Virology Departments of Animal and Food Sciences and Biological Sciences		
eRA COMMONS USER NAME (credential, e.g., agency login)			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
University of Delaware	BA	06/84	Biological Sciences
University of Delaware	PhD	06/94	Biological Sciences
University of Delaware	Postdoc.	11/96	Animal Science

## PERSONAL STATEMENT

**Research:** The major research focus of our laboratory is Marek's disease virus (MDV), a T-lymphoma inducing herpesvirus of chickens. Projects are focused on: the mechanism of MDV-mediated T-cell transformation, the evolution of MDV virulence, and MDV vaccine development and testing. In addition, there are projects focused on the immune mechanisms of anti-tumor immunity with MDV and canine hemangiosarcoma as models.

**Teaching:** The main courses currently being taught are Introduction to Animal Virology (ANFS 435/635), Paradigms in Cell Signaling (ANFS/PLSC 671), a Sophomore Career Class (ANFS 265), and a First Year Seminar course (UNIV 101).

**K-12 Outreach:** Our laboratory has consistently provided training to undergraduate, and high school students. Dr. Parcels serves as a Regional Science Fair judge in the topics of Biochemistry, Microbiology, Medicine and Health and Zoology. In addition, he has provided AP Biology lectures to area High Schools on Biotechnology, Cancer and Immunology. He has been working with UD researchers and area High Schools on developing a STEM project (SCEBA, Student Cloning and Expression for Bioimaging Applications) to synthesize concepts in genetics, molecular and cell biology through laboratory experiences. Although not funded, this proposal was ranked as competitive in the NSF-STEM ITEST program and a follow-up submission is planned.

**Diversity Outreach:** Dr. Parcels has served on several committees devoted to the increasing the diversity of graduate education at the University of Delaware. He was a committee that drafted the College of Agriculture and Natural Resources (CANR) Summer Institute (a 10-week summer fellowship for minority students seeking graduate education in Agriculture). He has hosted both Summer Institute and Ronald E. McNair Scholars students in his laboratory. He serves on the task force to increase minority student retention and success.

## EMPLOYMENT

Professor, ANFS, BISC (Joint Appointment), University of Delaware	2010 - present
Associate Professor (Joint Appointment), BISC, University of Delaware	2007 - 2010
Associate Professor, ANFS, University of Delaware	2004 - 2010
Associate Professor, POSC/CEMB, University of Arkansas	2001 – 2004
Assistant Professor, POSC/CEMB, University of Arkansas	1996 – 2001

## AWARDS, HONORS and GRANTS

Jozsef Marek Award, Hungarian Academy of Sciences, Veterinary Medical Research Institute, Lake Balaton, Hungary 2007

Jozsef Marek Centennial Lecture, 15<sup>th</sup> Annual Derzsy Napok, Lake Balaton, Hungary 2007

Presidential Citation for Distinguished Alumni, University of Delaware, August 2004

Keynote Address, 5<sup>th</sup> International Symposium on Marek's Disease, Oxford University, UK July 2004

HyLine International Research Award, 2002

University of Arkansas Mentoring Award, 2000, 2004

## **FEDERAL GRANTS**

### University of Delaware:

NIFA: "Functional Genomics of Infectious Laryngotracheitis Virus (ILTV)" \$ 274,000 (9/1/2011 – 8/31/2013),  
Co-PIs: C. Keeler, M.S. Parcells

USDA NRI, "Mutations in Glycoprotein L and Meq and Their Effect on Marek's disease virus (MDV) Virulence,"  
\$ 353,000. (*Rated #1 grant by Panel*) (9/1/2007 – 8/31/10) PI: M.S. Parcells

### University of Arkansas

NSF Equipment Grant, "Acquisition of a Laser Scanning Confocal Microscope for the Cell and Molecular Biosciences Program", \$ 296, 862 (with College match of \$220,226). Co-PIs: J. Kirby (Senior), J. Durdik, M. S. Parcells, W. Keunzel, and G.F. Erf (U. Arkansas, 2004)

USDA NRI "Characterization of a Marek's Disease Virus (MDV)-encoded Chemokine." \$275,000 (9/1/01 – 8/31/04) Co-PIs: Hsing-Jien Kung (UC-Davis) and Mark S. Parcells.

USDA NRI Meeting Grant, "6th International Symposium on Marek's Disease" (Meeting Grant), \$ 8, 000 (10/00-8/01); PI: Mark Parcells.

## **INDUSTRY-SPONSORED RESEARCH**

### University of Delaware

*Bayer Animal Health*: total of ~ \$140,000 since 2008  
*CEVA-Biomune, CEVA-Phylaxia*: total of ~\$20,000 since 2007  
*Cobb-Vantress, Inc.*: total of \$50,000 since 2007)  
*Embrex, Inc.*: total of \$20,000 in 2007  
*Intervet, (Schering-Plough Animal Health)*: total of ~\$120,000 since 2005  
*Merial, Inc.* (Lyon, France): total of ~ \$ 250,000 since 2007  
*Pfizer Animal Health*: total \$35,000, since 2012

### University of Arkansas

*Merial, Inc.* (Lyon, France): total of \$379,433.00 (2001 - 2004)

## **NATIONAL ORGANIZATION-SPONSORED RESEARCH**

### University of Delaware

US Poultry and Egg Association: The Role of Glycoprotein L Mutations in Marek's Disease Virus (MDV) Evolution of Virulence (\$31,500), 6/05 – 5/07, PI: M.S. Parcells

### University of Arkansas

US Poultry and Egg Association (renewal), "Mutations in Marek's Disease Virus Glycoproteins gL and gH and Their Relationship to Enhanced Virulence of MDV Strains", with collaborators: Dr. Lucy F. Lee and Dr. Sanjay Reddy (USDA-ADOL, East Lansing, MI), and Dr. Carl J. Schmidt, University of Delaware. \$ 80,000 total award (2 years of funding, 2002 - 2004)

## **STATE AND COLLEGE GRANTS**

### University of Delaware

Avian Bioscience Center: "Mutations in the Meq Oncoprotein of Marek's Disease Virus and Their Impact on Increased Virulence and Immune Evasion" 1/07 – 7/07, \$17, 000, PI: M.S. Parcells

Avian Bioscience Center: "Molecular Cloning and Characterization of a Highly-pathogenic Infectious Laryngotracheitis Virus Field Strain", 1/08- 12/08, \$25,000, PI: M.S. Parcells

CANR Seed Grant: "Development and Testing of Cell-based Anti-tumor Vaccines for Two Common and Deadly Malignancies of Companion Animals", \$20,000, 6/1/08 – 5/31/10, PI: M.S. Parcells

### University of Arkansas

Arkansas Biotechnology Institute (ABI): Latent Virus Genome Expression of Marek's Disease Virus (MDV) and Its Contribution to Lymphomagenesis. \$ 150,000 (3 yrs, \$ 50,000 per year 2003 - 2005). PI: M. S. Parcells

State Undergraduate Research Fellowship (SURF). Roles of Virion-host Shut-off Protein (vhs, UL41 gene product) and US3-encoded Protein Kinase in Major Histocompatibility Class I (MHC-I) Downregulation in Marek's Disease Virus (MDV)-infected Cells. \$ 3,900, Student: Eric J. Wright, Mentor: Dr. Mark S. Parcells

Animal Health Grant, UA-AG: "Functional Analysis of the Marek's Disease Virus (MDV) Meq Oncoprotein in the Regulation of Latency and Transformation", Dr. Mark S. Parcells \$ 10,000 per year (2 years of funding)

Research Incentive Grant, UA-AG: "Mutations of the Meq Oncoprotein and Their Effects on Cell Proliferation, Apoptosis Inhibition, and Transactivation and Repression", Co-PIs: Mark S. Parcells, Vaithilingaraja Arumugaswami (PhD student), \$ 10,000 (5/02 – 4/03)

## PROFESSIONAL SOCIETIES AND ADVISORY COMMITTEES

**Peer Review:** Avian Diseases, Avian Pathology, BMC – Veterinary Research, BMC – Genomics, J. Clinical Microbiology, J. Gen. Virology, J. Infectious Diseases, J. Virology, Medical Science Monitor, PLoS-ONE, PLoS – Pathogen, PNAS-USA, Poultry Science, Vaccine, Veterinary Microbiology, Veterinary Research, Virology, Virology Journal, Virus Genes

**Editorial Boards:** Avian Diseases (2004 – present), Medical Science Monitor (2002 – present) Poultry Science (2008 – present)

**Peer Reviews (Grants):** NSF-EID (Panel member 2007 – 2009), USDA-NRI (Panel member, 1998, 2003 - 2005), US-AID, BARD, CRD, USDA-SBIR

**Advisory Boards:** Avian Diseases, BIOMUNE, INC., Institutional Biosafety committee (1998 – 2002), Hyline International Research Award Selection Committee (Chair) 2005; Poultry Advisory Board, Bayer Animal Health (2012-present)

### Committee Service

U. Arkansas: Animal Biotechnology Committee (2003 – 2004), Institutional Biosafety Committee (2000 – 2004), Bioinformatics Committee (2001 – 2004), Nominations and Elections Committee (2000 – 2004), Poultry Health Laboratory (1997 – present, Interim Director, 1999-2000)

U. Delaware: Institutional Biosafety Committee (2008 – present, chair 2010-present), Department Promotion and Tenure Committee (2005, chair; 2012), College Promotion and Tenure Committee (2006 – 2007, 2010 - 2011), Department Graduate Committee (2006 – present, current chair), College Facilities and Equipment Committee (2006 – present), College Graduate Advisory Board (2008 – present), University Committee on Student Life (2008 – present, Chair 2009 - present), UD Speaks (Distinguished Lecturer Program) (2009 – 2011), Faculty Fellow (2010 – 2012), First Year Experience/Seminar (FYE/FYS): 2009, 2011, 2012

## PUBLICATIONS

**Anobile, J., V. Arumugaswami, D. Downs, K. Czymmek, M. S. Parcells and C. J. Schmidt.** 2006. Nuclear Localization and Dynamic Properties of the Marek's Disease Virus Oncogene Products Meq and Meq/vIL8. J. Virol. 80:1160-1166.

**Arumugaswami, V., P. M. Kumar, V. Konjufca, R. L. Dienglewicz, S. M. Reddy and M. S. Parcells.** 2009. Latency of Marek's Disease Virus (MDV) in a Reticuloendotheliosis Virus-Transformed T-cell Line. I: Uptake and Structure of the Latent MDV Genome. Avian Dis. **53**:149-155.

**Arumugaswami, V., P. M. Kumar, V. Konjufca, R. L. Dienglewicz, S. M. Reddy and M. S. Parcells.** 2009. Latency of Marek's Disease Virus (MDV) in a Reticuloendotheliosis Virus-Transformed T-cell Line. II: Expression of the Latent MDV Genome. Avian Dis. **53**:156-165.

**Burgess, S.C., J. R. Young, B. J. G. Baaten, L. Hunt, L. N. J. Ross, M. S. Parcells, P. M. Kumar, C. A. Tragaskes, L. F. Lee and T. F. Davison.** 2004. Marek's disease is a natural model for lymphomas overexpressing Hodgkin's disease antigen (CD30). PNAS USA 101:13879-13884.

- Farkas, T., B. Fey, E. Hargitt III, M. Parcels, M. Murgia, and Y. Saif.** 2012. Molecular detection of novel picornaviruses in chickens and turkeys. *Virus Genes* 44:262-72.
- Kumar, P. M., V. Arumugaswami, H. Dong, D. Yannessa, R. L. Dienglewicz, P. Tavlarides-Hontz, and M. S. Parcels.** 2012. Spliced gene products of the Meq oncoprotein of Marek's disease virus (MDV) are expressed during latency, bind to the MDV genome, are potent transcriptional repressors, and induce cellular proliferation. *J Virol.* (in revision).
- Kumar, P. M., H. Dong, D. Lenihan, S. Gaddamanugu, U. Katneni, S. Shaikh, P. Tavlarides-Hontz, S. Reddy, and M. S. Parcels.** 2012. Selection of a recombinant Marek's disease virus (MDV) in vivo through expression of the Meq oncoprotein: characterization of an rMd5-based mutant expressing the Meq protein of strain RB-1B. *Avian Dis.* 56:328-340.
- Lee, S.-H., H. S. Lillehoj, S. I. Jang, C. Baldwin, D. Tompkins, B. Wagner, M. Parcels, E. Del Cacho, Y.-H. Hong, W. Min, and E. P. Lillehoj.** 2011. Development and Characterization of Mouse Monoconal Antibodies Reactive with Chicken Interleukin-2 Receptor Alpha Chain (CD25). *Veterinary Immunol. and Immunopathol.* 15:396-404.
- Levy, A. M., Y. Izumiya, P. Brunovskis, L. Xia, M. S. Parcels, S. M. Reddy, L. Lee, H. W. Chen, and H. J. Kung.** 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.
- McCarthy, F. M., T. J. Mahony, M. S. Parcels, and S. C. Burgess.** 2009. Understanding Animal Viruses Using the Gene Ontology and AgBase. *Trends in Microbiology*, 17: 328 - 335.
- Morgan, R. W., A. Anderson, E. Bernberg, S. Kamboj, E. Huang, G. Lagasse, G. Isaacs, M. Parcels, B.C. Myers, P. J. Green, and J. Burnside.** 2008. Sequence Conservation and Differential Expression of Marek's Disease Virus microRNAs. *J. Virol.* 82:12213-12220.
- Parcels M. S., Arumugaswami V., Prigge J. T., Pandya K., Dienglewicz R. L.** 2003. Marek's disease virus reactivation from latency: changes in gene expression at the origin of replication. *Poultry Sci.* 82:893-898.
- Parcels, M.S., J. Burnside and R. W. Morgan.** 2012. Marek's Disease Virus (MDV)-induced T-cell Lymphomas. Chapter 13 in E. Robertson (ed.), *Cancer-associated Viruses*. Springer, New York
- Parcels, M.S. and S. C. Burgess.** 2008. Immunological Aspects of Marek's Disease Virus (MDV)-Induced Lymphoma Progression. In: *Selected Aspects of Cancer Progression: Metastasis, Apoptosis, and Immune Response*. H. E. Kaiser, ed., Springer, the Netherlands, p. 169-191.
- Parcels, M. S., S. F. Lin, R. L. Dienglewicz, V. Majerciak, D. R. Robinson, H. C. Chen, Z. Wu, G. R. Dubyak, P. Brunovskis, H. D. Hunt, L. F. Lee, and H. J. Kung.** 2001. Marek's disease virus (MDV) encodes an interleukin-8 homolog (vIL-8): characterization of the vIL-8 protein and a vIL-8 deletion mutant MDV. *J Virol.* 75:5159-73.
- Prigge, J. T., V. Majerciak, H. D. Hunt, R. L. Dienglewicz, and M. S. Parcels.** 2004. Construction And Characterization of Marek's Disease Viruses (MDVs) Having Green Fluorescent Protein Expression Tied Directly Or Indirectly To Phosphoprotein 38 (pp38) Expression. *Avian Dis.* 48:471-487. **(Received P.P. Levine Award for Best Paper in Avian Diseases, 2004)**
- Rath, N. C., M. S. Parcels, H. Xie, and E. Santin.** 2003. Characterization of a spontaneously transformed chicken mononuclear cell line. *Vet Immunol Immunopathol.* 96:93-104.
- Santin, E. , C.E. Shamblin, J. T. Prigge, V. Arumugaswami, R. L. Dienglewicz and M.S. Parcels.** 2006. Examination of a Naturally-occurring Mutation in Glycoprotein L (gL) on Marek's Disease Virus Pathogenesis. *Avian Dis.* 50:96-103.
- Shaikh, S. A. R., U. K. Katneni, H. Dong, S. Gaddamanugu, P. Tavlarides-Hontz, K. W. Jarosinski, N. Osterrieder, and M. S. Parcels.** 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., (in press).

**Shamblin, C.E., N. Greene, V. Arumugaswami, R. L. Dienglewicz, and**

**M. S. Parcels.** 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.

**Tavlarides-Hontz, P., P. M. Kumar, J. R. Amortegui, N. Osterrieder, and M. S. Parcels.** 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.

**Trapp, S., M.S. Parcels, J.P. Kamil, D. Schumacher, B. K. Tischer, P. M. Kumar, V. K. Nair, and N. Osterrieder.** 2006. A virus-encoded telomerase RNA promotes malignant T cell lymphomagenesis. J. Exp. Med. 203:1307-1317.