BIOGRAPHICAL SKETCH

NAME: Eric J. Montemayor

eRA COMMONS USER NAME: emontemayor

POSITION TITLE: Associate Scientist

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Texas at Austin	B.S.	12/2003	Biochemistry
University of Texas at Austin	Ph.D.	08/2008	Physical Chemistry
University of Texas Health Science Center	Postdoctoral	12/2012	Structural Biology

A. Personal Statement

I am generally interested in the structure and function of essential protein and RNA complexes. To date, I have determined 14 unique structures of enzymes and protein-RNA assemblies. Although my previous work primarily used X-ray crystallography, recent technological advances have drawn my interests towards cryo-electron microscopy. I am therefore actively seeking opportunities to leverage my expertise in X-ray crystallography to rapidly develop a mature skillset in cryo-electron microscopy. To this end, I was a recent participant in the inaugural Cryo-EM course at Cold Spring Harbor Laboratories.

B. Positions and Honors

Professional Experience and Training

2004-2008 Graduate Research Assistant, University of Texas at Austin
2009-2012 Postdoctoral Fellow, University of Texas Health Science Center at San Antonio
2013-2014 Postdoctoral Research Associate, University of Wisconsin-Madison
2014-2016 Assistant Scientist, University of Wisconsin-Madison
2016-pres. Associate Scientist, University of Wisconsin-Madison

Other Experience and Professional Service

2009-pres. Member, American Crystallographic Association
2012-pres. Member, RNA Society
2012 Session Chair, American Crystallographic Association
2012 Chair, Young Scientist Interest Group, American Crystallographic Association
2013 Session Chair, American Crystallographic Association
2014 Member, Executive Council, American Crystallographic Association
2014-2018 Staff Representative to Faculty, Department of Biomolecular Chemistry, UW-Madison
2015 Session Chair, American Crystallographic Association
2016 Session Chair, American Crystallographic Association
2016-pres. Ad hoc peer reviewer for Nature, PNAS, RNA and Nature Communications
2018 Cold Spring Harbor Cryo-EM course
2018-pres. Member, Microscopy Society of America
2018-pres. Member, U.S. National Committee for Crystallography (USNC/Cr)

Honors

2003 Undergraduate Research Award, University of Texas at Austin
2003 BASF Endowed Scholarship, University of Texas at Austin
2009 NIH Postdoctoral Fellowship (T32-AG021890)
2010 NSF Postdoctoral Fellowship (DBI-0905865)
2014 Paul Boyer Award for Outstanding Postdoctoral Studies in Biochemistry, UW-Madison

C. Contributions to Science

1. **Mechanistic studies on spliceosomal proteins and RNA.** Relatively little is known about the structure and dynamics of the U6 small nuclear RNA, which plays a critical role in the normal expression of almost every human gene. In order to address this lack of knowledge, I have reconstituted the entire U6 small nuclear ribonucleoprotein particle (which contains nine molecules) from purified protein and RNA components, with the overarching goal of understanding the structure and function of this massive complex. As part of this process, I recently determined a crystal structure of the U6 snRNP core, consisting of U6 RNA and the Prp24 structural chaperone. The determined structure provides the first atomic-resolution image of U6 snRNA, and is the first view of a tetra-RRM protein bound to its cognate RNA. This structural information will serve as a paradigm for how multi-RRM proteins bind to RNA and drive structural remodeling of larger assemblies like the spliceosome.

    a. **Montemayor, E.J.**, Curran, E.C., Liao, H., Andrews, K.L., Treba, C.N., Butcher, S.E., Brow, D.A. (2014) Core structure of the U6 snRNP at 1.7 Å resolution. *Nature Structural and Molecular Biology* **21**, 544-551 (Cover article, also featured in NSMB "News and Views" and on F1000).
    b. **Montemayor, E.J.**, Didychuk, A.L., Sidhu, G.K., Yake, A.D., Brow, D.A., Butcher, S.E. (2018) Architecture of the U6 snRNP reveals specific recognition of 3′-end processed U6 snRNA. *Nature Communications* 9, 1749 (corresponding author).

2. **Structural enzymology - intron processing.** During my postdoctoral training, I successfully crystallized the RNA intron debranching enzyme Dbr1 from *E. histolytica* and determined its three-dimensional structure at 2.0 Angstrom resolution. The resulting structural data resolved a decades long question regarding how this class of enzyme specifically recognizes lariat branchpoint RNA, a byproduct of spliceosome-mediated intron excision from precursor messenger RNA.

    a. **Montemayor, E.J.**, Katolik, A., Taylor, A.B., Clark, N.E., Schuermann, J.P., Combs, D.J., Johnsson, R., Holloway, S.P., Damha, M.J., Stevens, S.W., Hart, P.J. (2014) Structural basis of lariat RNA recognition by the intron debranching enzyme. *Nucleic Acids Research* **42**, 10845-10855 (Cover article, recognized as a "breakthrough" by NAR editorial staff, and featured on F1000).

3. **Structural enzymology - polyamine catabolism.** During my graduate training, I determined the structure of spermine/spermidine-N^1-acetyltransferase (SSAT) in complex with its substrate spermine, thereby providing insights into polyamine catabolism in humans. Notable discoveries include the fact that polyamines can remain mostly hydrated when bound to an enzyme active site, and that associated solvent generates a "proton wire" that plays a direct role in enzymatic catalysis.

    a. **Montemayor, E.J.**, Hoffman, D.W. (2008) The crystal structure of spermidine/spermine N^1-acetyltransferase in complex with spermine provides insights into substrate binding and catalysis. *Biochemistry* **47**, 9145-9153.

4. **Professional service and outreach.** I am very active in the American Crystallographic Association, having chaired four scientific sessions at annual meetings and recently serving on the association's executive council. I was also elected by my peers to serve as Chair of the "Young Scientists – Scientific Interest Group". A common vein of my service to the ACA has been the provision of networking and career development opportunities to other young investigators, and creation/management of a high school scientific outreach project.

    a. High School Outreach project that I established with my colleague Karen Allen at Boston University: www.bu.edu/chemistry/2012/06/05/bu-chemistry-welcomes-students-as-part-of-the-aca-high-school-outreach-program/

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1tWdkpcl78bkg/bibliography/48010074/public/?sort=date&direction=ascending

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Wright, Elizabeth Rose

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

POSITION TITLE: Professor

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
Columbus State University, Columbus, GA	B.S	05/1995	Biology
Columbus State University, Columbus, GA	B.S	05/1997	Chemistry
Emory University, Atlanta, GA	Ph.D.	05/2003	Chemistry
University of Southern California, Los Angeles, CA	Postdoctoral	09/2003	Materials Science
California Institute of Technology, Pasadena, CA	Postdoctoral	08/2008	Structural Biology

A. Personal Statement

I am a structural biologist with over 20 years of expertise in cryo-EM, cryo-ET, genetic engineering, protein expression and purification, and microbiology. The overarching goal of my research program is to determine the structures of protein assemblies, several bacterial species, selected bacteriophages, HIV-1, human respiratory syncytial virus (hRSV), measles virus (MeV), and other host-pathogen systems while simultaneously developing and using state-of-the-art correlative microscopy methods, cryo-electron microscopy (cryo-EM), cryo-electron tomography (cryo-ET), and novel imaging processing approaches. The structural information will provide insight into structure-function relationships that mediate diseases related to protein misfolding and aggregation, and bacterial and viral infectivity and pathogenesis. I have published many peer-reviewed articles in the field of cryo-EM based structural biology and have demonstrated a track record of productive research in this field, and specifically related to structural virology and structural cell biology. The research environment of my laboratory provides trainees with rich experiences in the use of advanced molecular biology and imaging approaches to investigations of complex structure-function questions in the biomedical sciences. I am also the Director of the newly established cryo-EM Research Center in the Department of Biochemistry at the University of Wisconsin, Madison.

a. C. M. Hampton, J. D. Strauss, Z. Ke, R. S. Dillard, J. E. Hammonds, E. Alonas, T. M. Desai, M. Marin, R. E. Storms, F. Leon, G. B. Melikyan, P. J. Santangelo, P. W. Spearman, & E. R. Wright. Correlated Fluorescence Microscopy And Cryo-Electron Tomography Of Virus-Infected And Transfected Mammalian Cells. *Nature Protocols*. 2017: 12 (1): 150-167. PMID: 27977021; PMCID: PMC5385890
b. E. H. Egelman, C. Xu, F. DiMaio, E. Magnotti, C. Modlin, X. Yu, E. Wright, D. Baker, & V. P. Conticello. Structural Plasticity of Helical Nanotubes Based on Coiled-coil Assemblies. *Structure*. 2015: 23 (2): 280-9. PMID: 25620001; PMCID: PMC4318749
c. H. Yi, J. D. Strauss, Z. Ke, E. Alonas, R. S. Dillard, C. M. Hampton, K. M. Lamb, J. E. Hammonds, P. J. Santangelo, P. W. Spearman & E. R. Wright. Native Immunogold Labeling of Cell Surface Proteins and Viral Glycoproteins for Cryo-Electron Microscopy and Cryo-Electron Tomography Applications. *Journal of Histochemistry and Cytochemistry*. 2015: 63 (10): 780-792. PMID: 26069287; PMCID: PMC4823802
d. G. Kiss, X. Chen, M. A. Brindley, P. Campbell, A. L. Afonso, Z. Ke, J. M. Holl, R. C. Guerrero-Ferreira, L. A. Byrd-Leotis, J. Steel, D. A. Steinhauer, R. K. Plemper, D. F. Kelly, P. W. Spearman, & E. R. Wright. Capturing Enveloped Viruses On Affinity Grids For Downstream Cryo-Electron Microscopy Applications. *Microscopy and Microanalysis*. 2014: 20: 164-174. PMID: 24279992; PMCID: PMC4073796

B. Positions and Honors

Professional Experience

2003	Postdoctoral Research Associate: Materials Science Department, University of Southern California
2003-2008	Postdoctoral Scholar: Division of Biology, California Institute of Technology
2008-2018	Assistant Professor: Department of Pediatrics, Division of Infectious Diseases, Emory University School of Medicine
2008-2018	Director, The Robert P. Apkarian Integrated Electron Microscopy Core Emory University
2009-2018	Adjunct Assistant Professor: School of Biology, Georgia Institute of Technology
2014-2018	Secondary Appointment: Department of Microbiology & Immunology, Emory University School of Medicine
2016-2018	Associate Professor: Department of Pediatrics, Division of Infectious Diseases, Emory University School of Medicine
2018 -	Adjunct Associate Professor: Department of Pediatrics, Division of Infectious Diseases, Emory University School of Medicine
2018 -	Professor: Department of Biochemistry, University of Wisconsin, Madison
2018-	Affiliate Investigator, Morgridge Institute for Research
2018 -	Director, Cryo-Electron Microscopy Center, Department of Biochemistry, University of Wisconsin, Madison

Other Experience and Professional Memberships

1997-	American Chemical Society (ACS)
1998-	Microscopy Society of America (MSA)
2008-	Biophysical Society
2009-	American Society of Microbiology (ASM)
2009-	NIH Study Section: S10 Shared Instrumentation Grants, ad hoc reviewer
2009, 2010	NSF Peer Review Committee: NSF Major Research Instrumentation Program
2014, 2017	NIH Study Section: MSF-C, ad hoc reviewer
2014, 2015	Member of NIH Special Emphasis Panel (ZRG1 OBT-A (40) P), (ZRG1 IMST-J (51) R)
2015-	Southeastern Microscopy Society (SEMS)
2015	The Hercules Foundation (Flemish), Research Infrastructure Development
2015	Scientific Review of MRC Laboratory of Molecular Biology, Cambridge (LMB): Structural Studies Division (2015 Quinquennial Review)
2016	Chair of NIH Special Emphasis Panel (ZRG1 BCMB-S (40) P)
2016, 2016	Member of NIH Special Emphasis Panel (ZRG1 AARR-P (02)), (ZRG1 CB-R (40) P)
2016	M. J. Murdock Charitable Trust
2017	Member of NIH Special Emphasis Panel (ZRG1 BCMB-P (50) P)
2018	Medical Research Council (MRC)

Editorial Service

2016 -	Biological Applications Editor, *Microscopy and Microanalysis*
2017	*Viruses*, Guest Editor, Special Issue: Advances in Structural Virology via Cryo-EM

Ad hoc reviewer for *Applied & Environmental Microbiology, Biopolymers, Cell, Chemical Communications, eLife, Emerging Infectious Diseases, ISME Journal, Journal of Chemical Biology, Journal of Molecular Biology, Journal of Structural Biology, JoVE, Journal of Virology, Micromachines, Microscopy & Microanalysis, Nature Microbiology, Nature Methods, Nature Protocols, PLoS Biology, PLoS Pathogens, Proceedings of the National Academy of Sciences (USA), Retrovirology, Science Reports, Virology*

Honors

1996-1997	American Institute of Chemists Award for Outstanding Chemistry Senior, Department of Chemistry and Geology, Columbus State University
2000-2001	Graduate Assistance in Areas of National Need Fellow, Department of Chemistry, Emory University
2001	Microscopy Society of America Presidential Student Award, Microscopy Society of America

2001	Dr. Osborne Robinson Quayle Fellowship for Excellence in Graduate Research, Department of Chemistry, Emory University
2003-2005	Rosalind Alcott Postdoctoral Fellowship, Biology Division, California Institute of Technology
2005-2007	NIH NRSA Postdoctoral Fellowship (F32 GM075543)
2008-	Emory Center for AIDS Research (CFAR) Investigator
2008-	Georgia Research Alliance (GRA) Distinguished Investigator
2011-2013	Microscopy Society of America, Director for the Biological Sciences
2012	Junior Faculty Researcher of the Year, Department of Pediatrics, Emory University
2014-2016	Division Officer, American Society of Microbiology, J: Division of Cell and Structural Biology

C. Contributions to Science

1. Cryo-EM Structural Studies Of Enveloped Viruses. My interest in protein assembly has further developed to studies of virus replication and how viruses assemble from the simplest constituents to form a population of infectious virus particles. Through the development and use of cryo-EM technologies, I have studied the maturation process of HIV-1, namely the first principles that govern the arrangement of the Gag polyprotein of immature HIV-1. During the course of these studies, we applied novel sub-volume averaging approaches and revealed that the capsid (CA) domain is locked into a specific conformation at its C-terminal end by a six-helix bundle formed by SP-1. I have expanded the scope of my work to include cryo-EM structural studies of paramyxoviruses, namely measles virus (MeV) and respiratory syncytial virus (RSV). Publications in this area have reported on the 3D structure of MeV and its glycoproteins, RNA-sensitive probe delivery for imaging of RSV in cells, and the 3D structure of purified RSV particles. To further improve cryo-EM studies of HIV and RSV, correlative imaging schemes were developed to support examinations of processes associated with virus fusion and entry as well as assembly in the context of the whole cell environment.

a. Z. Ke*, J. D. Strauss*, C. M. Hampton, M. A. Brindley, R. S. Dillard, F. Leon, K. M. Lamb, R. K. Plemper, & E. R. Wright. The Measles Virus Matrix-Protein Regulates Organization Of Virus Assembly. *Nature Communications*. 2018: 9: 1736. PMID: 29712906; PMCID: 5928126
b. C. C. Stobart, C. A. Rostad, Z. Ke, R. S. Dillard, C. M. Hampton, J. D. Strauss, H. Yi, A. L. Hotard, J. Meng, R. J. Pickles, K. Sakamoto, S. Lee, M. G. Currier, S. M. Moin, B. S. Graham, M. S. Boukhvalova, B. E. Gilbert, J. C. G. Blanco, P. A. Piedra, E. R. Wright†, & M. L. Moore†. A Live-Attenuated RSV Vaccine With Increased Incorporation Of Pre-Fusion F Exhibits Enhanced Thermal Stability And Immunogenicity. *Nature Communications*. 2016: 7: 13916. PMID: 28000669; PMCID: PMC5187593
c. G. Kiss, J. M. Holl, G. M. Williams, E. Alonas, D. Vanover, A. W. Lifland, M. Gudheti, R. C. Guerrero-Ferreira, V. Nair, H. Yi, B. S. Graham, P. J. Santangelo, & E. R. Wright. Structural Analysis of Respiratory Syncytial Virus Reveals the Position of M2-1 Between the Matrix Protein and the Ribonucleoprotein Complex. *Journal of Virology.* 2014: 88(13): 7602-7617. PMID: 24760890; PMCID: PMC4054448
d. E. R. Wright*, J. B. Schooler*, H. J. Ding, C. Kieffer, C. Fillmore, W. I. Sundquist, & G. J. Jensen. Electron Cryotomography of Immature HIV-1 Reveals the Structure of the CA and SP1 Domains of Gag. *The EMBO Journal*. 2007: 26 (8), 2218-2226. PMID: 17396149; PMCID: PMC1852790

2. Development Of Cryo-EM And Correlative Microscopy Imaging Tools. I am dedicated to the advancement of cryo-EM, cryo-ET, and microscopy methods in general. I have been a principal investigator or collaborative investigator on the development of cryo-EM methods, including methods associated with sample preservation, sample imaging, and image analysis. Many of the technologies and methods are commonly employed throughout the cryo-EM community. Many viruses that are studied by EM may be difficult to prepare or purify. To circumvent this problem, my research group developed affinity capture methods to selectively capture enveloped viruses on EM support grids. In addition, we have also developed a native immunolabeling strategy for cell surface proteins and viral glycoproteins that enhances our ability to locate and target regions of interest under cryo-EM imaging conditions as well as determine variation in biological states of complex systems. My lab continues to develop Zernike-style (ZPC) and hole-free (HF) phase contrast electron microscopy to improve data collection and subsequent structure determination. Published studies have illustrated the value of employing ZPC cryo-ET to determine the 3D structures of whole bacterial cells and viruses. Correlative imaging strategies, including the development of labeling methods and imaging platforms, have also been developed to further our structural studies of bacteria, viruses, and mammalian cells.

a. C. M. Hampton, J. D. Strauss, Z. Ke, R. S. Dillard, J. E. Hammonds, E. Alonas, T. M. Desai, M. Marin, R.

E. Storms, F. Leon, G. B. Melikyan, P. J. Santangelo, P. W. Spearman, & E. R. Wright. Correlated Fluorescence Microscopy And Cryo-Electron Tomography Of Virus-Infected And Transfected Mammalian Cells. *Nature Protocols*. 2017: 12 (1): 150-167. PMID: 27977021; PMCID: PMC5385890

b. H. Yi, J. D. Strauss, Z. Ke, E. Alonas, R. S. Dillard, C. M. Hampton, K. M. Lamb, J. E. Hammonds, P. J. Santangelo, P. W. Spearman & E. R. Wright. Native Immunogold Labeling of Cell Surface Proteins and Viral Glycoproteins for Cryo-Electron Microscopy and Cryo-Electron Tomography Applications. *Journal of Histochemistry and Cytochemistry*. 2015: 63 (10): 780-792. PMID: 26069287; PMCID: PMC4823802

c. R. C. Guerrero-Ferreira, & E. R. Wright. Zernike Phase Contrast Cryo-Electron Tomography Of Whole Bacterial Cells. *Journal of Structural Biology*. 2014: 185(1): 129-133. PMID: 24075950; PMCID: PMC4240974

d. G. Kiss, X. Chen, M. A. Brindley, P. Campbell, A. L. Afonso, Z. Ke, J. M. Holl, R. C. Guerrero-Ferreira, L. A. Byrd-Leotis, J. Steel, D. A. Steinhauer, R. K. Plemper, D. F. Kelly, P. W. Spearman, & E. R. Wright. Capturing Enveloped Viruses On Affinity Grids For Downstream Cryo-Electron Microscopy Applications. *Microscopy and Microanalysis*. 2014: 20: 164-174. PMID: 24279992; PMCID: PMC4073796

3. Structural Studies Of A Model Host-Pathogen System. I study the structure-function dynamics associated with a model bacterial system, *Caulobacter crescentus* and its bacteriophage. These studies serve as a platform for understanding the basic principles associated with virus replication because φCbK bacteriophage infection is in synchrony with the *C. crescentus* cell-cycle and the presence of the polar flagellum and pili. The investigations determined that φCbK evolved a head-filament for adsorption to the *Caulobacter* flagellum. I also explore flagellum biosynthesis and how it's regulated by the cell-cycle.

a. C. K. Ellison, J. Kan, R. S. Dillard, D. T. Kysela, C. M. Hampton, Z. Ke, E. R. Wright, N. Biais, A. B. Dalia, & Y. V. Brun. Obstruction Of Pilus Retraction Stimulates Bacterial Surface Sensing. *Science*. 2017: 358 (6362): 535-538. PMID: 29074778; PMCID: PMC5805138

b. N. J. Davis, Y. Cohen, S. Sanselicio, C. Fumeaux, S. Ozaki, J. Luciano, R. C. Guerrero-Ferreira, E. R. Wright, U. Jenal, & P. H. Viollier. De- And Re-Polarization Mechanism Of Flagellar Morphogenesis During A Bacterial Cell Cycle. *Genes and Development*. 2013: 27 (18) 2049-2062. PMID: 24065770; PMCID: PMC3792480

c. R. C. Guerrero-Ferreira, P. H. Viollier, B. Ely, J. S. Poindexter, M. Georgieva, G. J. Jensen, & E. R. Wright. Alternative mechanism for bacteriophage adsorption to the motile bacterium *Caulobacter crescentus*. *Proceedings of the National Academy of Sciences U.S.A.* 2011: 108 (24), 9963 - 9968. PMID: 21613567; PMCID: PMC3116389

4. Structure-Function Studies Of Protein Self-Assembly Systems. During my early work, I sought to understand how alterations to amino acid sequences change the physiochemical nature of proteins. Using genetic engineering, I designed elastin-mimetic block-copolymers that undergo temperature-induced phase transitions to foster the assembly of nanostructured materials, such as micelles and hydrogels. The elastin-derived block copolymers developed in these studies have been widely used for drug delivery and tissue engineering applications. Both early and later work targeted the development and use of cryo-EM methods to determine the structures of the self-assembled peptides and proteins at macromolecular resolution and high-resolution. These technologies have also been applied to structural studies of misassembled proteins and peptides in isolation and associated with mammalian cells.

a. E. Magnotti, S. Hughes, L. Hough, R. Dillard, A. Karumbamkandathil, T. Lian, J. Wall, X. Zuo, E. Wright, and V. Conticello. Self-Assembly Of An Alpha-Helical Peptide Into A Crystalline Two-Dimensional Nanoporous Framework. *Journal of the American Chemical Society*. 2016: 138 (50): 16274-16282. PMID: 27936625; PMCID: PMC5739522

b. E. H. Egelman, C. Xu, F. DiMaio, E. Magnotti, C. Modlin, X. Yu, E. Wright, D. Baker, & V. P. Conticello. Structural Plasticity of Helical Nanotubes Based on Coiled-coil Assemblies. *Structure*. 2015: 23 (2): 280-9. PMID: 25620001; PMCID: PMC4318749

c. C. Xu, R. Liu, A. Mehta, R. C. Guerrero-Ferreira, E. R. Wright, S. Dunin-Horkawicz, K. Morris, L. Serpell, X. Zuo, J. Wall, & V. P. Conticello. Rational Design of Helical Nanotubes from Self-assembly of Coiled-coil Lock Washers. *Journal of the American Chemical Society*. 2013: 135 (41): 15565-15578. PMID: 24028069

d. E. R. Wright, R. A. McMillan, A. Cooper, R. P. Apkarian, & V. P. Conticello. Thermoplastic Elastomer Hydrogels via Self-Assembly of an Elastin-Mimetic Triblock Polypeptide. *Advanced Functional Materials*. 2002: 12 (2), 149-154.

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/elizabeth.wright.1/bibliography/44909211/public/?sort=date&direction=ascending

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

DE-FOA-0001540-#0000227107 Donohue (PI) 12/01/2018-09/30/2022
Great Lakes Bioenergy Research Center
The major goals of this proposal are to create a Bioenergy Research Center that is shared between the University of Wisconsin and Michigan State University. The Center will perform basic research that targets barriers to commercial viability of lignocellulosic biofuels and bioproducts. The aims of the Wright lab project are to develop and apply multimodal protocols for three-dimensional (3D) cryo-ET imaging of bacterial species, such as *Rhodobacter sphaeroides.*
Role: Co-I

9R01 GM132068-11A1 Spearman (PI) 09/15/2018-08/31/2023
Role of Vpu, Tetherin, and Siglec-1 in HIV-1 Replication
The overall goals of this project are to define the intracellular trafficking of tetherin and the mechanism by which Vpu overcomes tetherin-mediated restriction, and to understand the cellular factors involved in the formation and function of the virus-containing compartment (VCC) in macrophages.
Role: Co-I

R01 GM124216 Garfinkel (PI) 09/01/2018-07/31/2022
Effectors of retrotransposon movement
The goal of this project is to understand the mechanism of Ty1 copy number control (CNC) by a combination of genetic, cell biological, biochemical and structural approaches.
Role: Co-I

R01 HL143794 Li (PI) 08/01/2018-06/30/2022
Conformational activation of von Willebrand factor
The objective of this proposed project is to elucidate how VWF and its cleaving enzyme, ADAMTS13, are self-inhibited and conformational changes they undergo during their activation. Understanding these processes at the molecular level will have significant implications on the pathogenesis of several prothrombotic diseases.
Role: Co-I

1018803.01 Wright (PI) 06/01/2018-12/31/2019
Burroughs Wellcome Fund
At The Interface: Collaboration To Determine The Structures Of Neuron Regulatory Complexes
The overall goals of this project are to foster collaborative, synergistic structural biology in neuroscience and define the molecular basis for the interactions of the ion channels and pumps, and membrane and cell architecture that governs AIS function.
Role: PI

R01 AI128837 Derdeyn (PI) 07/01/2017-06/30/2022
Using DNA/MVA/Protein Immunization Of Rhesus Macaques To Investigate How The Background Of The HIV-1 Envelope And Nature Of The Protein Boost Shape The Genetic And Functional Antibody Landscape
We propose to utilize patient-informed Env immunogens delivered via DNA/modified vaccinia Ankara (MVA) to define how natural history and presentation of the Envs shape the antibody landscape in rhesus macaques.
Role: Co-I

U24 GM116788 Taylor (PI) 07/01/2016-06/30/2020
The Southeastern Consortium for Microscopy of MacroMolecular Machines
This funding is to support investigator access to high-throughput, high-resolution cryo-EM instrumentation.
Role: Co-PI

R01 GM114561 Wright and Santangelo (MPI) 01/01/2016-12/31/2019
Structural Investigations of Macromolecular Complexes Critical to HRSV Life Cycle
The aims of this project are to determine: 1) the structural and functional implications of cellular and viral membrane structure and composition; 2) the structures formed between structural proteins and the genomic RNA during assembly; and 3) develop labeling strategies specifically for cryo-EM/cryo-ET technologies.
Role: Co-PI

R01 GM104540 Wright (PI) 01/01/2013-12/31/2019
Structure and Function of Prokaryotic Appendages By Cryo-Electron Tomography
The biological aims are to determine: 1) how redundancy of the flagellins in multi-component flagellar filaments alters overall flagellum structure and function, and 2) the structural variation that exists between several classes of type IV pili at the macromolecular level. The third aim is to develop cryo-ET technologies.
Role: PI

Pending Research Support

R21 HL146299 Li and Wright (multi-PI) 03/01/2019-02/28/2021
Cryo-ET Structural Studies of Platelets
The aims of this project are to: 1) develop multimodal protocols for three-dimensional (3D) cryo-ET imaging of human and murine platelets; 2) apply the developed cryo-ET protocols to characterize the 3D ultrastructure of platelets with therapeutic implications.
Role: Co-PI

R01 AI137127 Wrammert (PI) 04/01/2018-03/31/2023
Human B Cell Responses To A Live Attenuated Cholera Vaccine
The goal of this project is to understand the human B cell responses to a recently FDA approved live attenuated cholera vaccine in healthy volunteers.
Role: Co-I

R01 GM0386600-33 Landick (PI) 07/01/2019-06/30/2024
Structure/Function of Transcription Complex Regulation
The major goal of this project is to define the interactions within transcription elongation complexes and with regulatory proteins that cause and control pausing and termination by RNA polymerase.
Role: Collaborator

Completed Research Support

R01 GM054787 Melikian (PI) 09/20/2016-07/31/2018
Biophysics of Protein-Mediated Membrane Fusion
The major goals are to: 1) Develop cryo-CLEM strategies to assess the effect of HIV-1 entry sites on dilation of a fusion pore; 2) Elucidate the role of cell-generated mechanical forces in completing HIV-1 fusion at the plasma membrane and in endosomes; and 3) Define the mechanism by which SERINC5 inhibits HIV-1 fusion.
Role: Co-I

R21AI101775-02 Wright (PI) 04/01/2013-03/31/2016
Structural Studies of Respiratory Syncytial Virus
The major goals of this project are to determine the native structure of RSV and define the structural and functional role of the RSV matrix (M) protein.
Role: PI