

BIOGRAPHICAL SKETCH

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NAME: Andrew Mehle

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

POSITION TITLE: Associate 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
Villanova University, Villanova PA	BS	06/1998	Biology
Villanova University, Villanova PA	BA	06/1998	Honors
Harvard University, Cambridge MA mentor – Dana Gabuzda, MD	PhD	12/2004	Virology
University of California Berkeley, Berkeley CA mentor – Jennifer Doudna, PhD		08/2011	Postdoctoral training

A. Personal Statement

Influenza virus is a serious public health threat causing significant morbidity, mortality and socioeconomic consequences. Seasonal outbreaks are punctuated by the emergence of novel pandemic isolates that have even more potential for widespread infection and disease. Given the critical role of virus:host interactions during infection, and their attractiveness as a drug target, it is essential to clearly understand how influenza virus interfaces with cellular co-factors to express genes and replicate the genome while evading antiviral responses. My lab addresses this knowledge gap using complimentary approaches spanning from higher-level genome-wide genetic screens down to detailed biochemical and molecular studies. We have made significant progress in dissecting the regulatory mechanisms controlling the viral polymerase, especially post-translational modifications where we demonstrated that phosphorylation by host kinases regulates assembly of the viral replication machinery [1]. To accelerate these studies, we created a suite of highly sensitive influenza reporter viruses, now used by the community to rapidly analyze viral replication *in vivo*. This continued productivity resulted in being awarded a highly competitive Burroughs Wellcome Fund PATH fellowship and promotion to associate professor with tenure. Most recently, we identified cellular co-factors regulating influenza virus polymerase activity, leading to the exciting discovery that differential splicing of cellular co-factors reveals cryptic antiviral proteins and dictates viral host range and evolution [2-3]. A current major thrust stems from our CRISPR/Cas9 genetic screen that identified IFIT2 and IFIT3 as cellular co-factors that stimulate expression of influenza virus gene expression [4]. These results were rather surprising, as IFIT2 and IFIT3 are well known for their antiviral activity. However, our extensive analysis has shown that influenza virus usurps IFIT2 function, converting it from an antiviral protein into a proviral effector. Thus, the Mehle lab is highly motivated with the experience, new tools, preliminary data and collaborators needed to dissect the intracellular battle between influenza virus and the host. The lab also strives to be a supportive environment for training and professional growth, challenging trainees to expand their knowledge and scientific comfort zone. The close collaboration I have with my trainees fosters critical thinking skills, rigorous experimental design and effective scientific communication. The results and training opportunities in the lab have the potential to significantly impact our understanding of both viral and host mediators of disease.

1. Mondal A, Dawson AR, Potts GK, Freiburger EC, Baker SF, Moser LA, Bernard KA, Coon JJ, **Mehle A**. 2017. Influenza virus recruits host protein kinase C to control assembly and activity of its replication machinery. *eLife*. **6**:e26910. doi:10.7554/eLife.26910. PMC5791932
2. Baker SF, Ledwith MP, **Mehle A**. 2018. Differential splicing of ANP32A in birds alters its ability to stimulate RNA synthesis by restricted influenza polymerase. *Cell Reports*. **24(10)**:2581. PMC6157632.
3. Baker SF, Meistermann H, Tzouros M, Baker A, Golling S, Polster JS, Ledwith MP, Gitter A, Augustin A, Javanbakht H, **Mehle A**. 2020. Alternative splicing liberates a cryptic cytoplasmic isoform of mitochondrial MECP2 that antagonizes influenza virus. *BioRxiv*. 2020. doi:10.1101/2020.11.09.355982.

4. Tran V*, Ledwith MP*, Thamamongood T, Higgins CA, Tripathi S, Chang MW, Benner C, Garcia-Sastre A, Schwemmle M, Boon AC, Diamon MS, **Mehle A**. 2020. Influenza virus repurposes the antiviral protein IFIT2 to promote translation of viral mRNAs. *Nature Microbiology*. **5(12)**:1490-1503. PMC7677226.

B. Positions and Honors

Positions and Appointments

- 2022-2027 H. I. Romnes Faculty Fellows, University of Wisconsin-Madison
2018- **Associate Professor** (with tenure), Department of Medical Microbiology & Immunology, University of Wisconsin-Madison
2018- Independent Data Monitor for SurGene LLC and VIRIS Detection Systems Inc. administered by Montana State University
2011-2018 **Assistant Professor**, Department of Medical Microbiology & Immunology, University of Wisconsin-Madison
2005-2011 **Postdoctoral fellow**, Laboratory of Jennifer Doudna, PhD, University of California, Berkeley
2004-2005 **Postdoctoral fellow**, Laboratory of Dana Gabuzda, MD, Dana Farber Cancer Institute
1998-2004 **Graduate student**, Laboratory of Dana Gabuzda, MD, Harvard University

Honors

- 2022 H. I. Romnes Faculty Fellowship, UW Madison Named Professorship Selection Committee
2022 Wolfgang (Bill) Joklik Lecturer, plenary speaker, 41st American Society for Virology meeting
2021 Elected to the American Society for Virology executive council, Councilor for Animal Virology
2019 Invited speaker, Options for the Control of Influenza X (Singapore)
2018 Invited speaker, University of California Berkeley 10th Anniversary CEND Symposia
2017 Invited Instructor, 14th Hong Kong University – Pasteur Virology Course
2017 Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Disease
2016 Invited keynote speaker, 5th International Influenza Meeting (Munster, DEU)
2016 State-of-the-Art Lecturer, American Society for Virology annual meeting
2012 New Investigator Awardee, Wisconsin Partnership Education and Research Committee
2012 Shaw Scientist Awardee, James D. and Dorothy Shaw Fund, Greater Milwaukee Foundation
2009 K99/R00 NIH Pathways to Independence Award – NIGMS
2006 Kirschstein National Research Service Award Postdoctoral Fellowship – NIGMS
1998 National Science Foundation Predoctoral Fellowship
1998 John McClain Award (highest rank in major), Gregor Mendel Award (highest rank in sciences), and *summa cum laude* and Phi Beta Kappa, Villanova University
1994-1998 Presidential Scholar, Villanova University

Editorial Boards and service

- 2022- *PLOS Biology*, Academic Editor
2021-2024 Elected to the American Society for Virology executive council, Councilor for Animal Virology
2021 *Ad hoc reviewer*: Dutch Research Council (NWO)
2019-2023 Standing Member VirA study section
2019-2022 ASM Press Committee
2018- *PLOS Pathogens*, editorial board - Pearls editor
2018 *Ad hoc reviewer*: NIH Study section Topics in Virology – ZRG1 IDM-W (02)
2017, 19 *Ad hoc reviewer*: Agence Nationale de la Recherche (ANR)
2017 *Ad hoc reviewer*: Department of Defense Congressionally Directed Medical Research Programs
2016, 19 *Ad hoc reviewer*: NIH Study Section - VirA
2016, 17, 19, 21 *Ad hoc reviewer*: Wellcome Trust (and 2016 Wellcome Trust DBT India Alliance)
2016-2018 American Society for Virology Program Committee
2015-2018 *Viruses*, Associate Editor
2015, 20 *Ad hoc reviewer*: Medical Research Council (MRC, UK)

Editorial board member: *Frontiers in Virology* (2010-2021); *Journal of Virology* (2015-); *Viruses* (2015-); *Virology* (2015-); *Current Research in Virological Science* (2020-)

Selected speaker, session chair and invited seminars (since 2011)

2011: Bay Area Symposia on Viruses; **2012**: Loyola University Stritch School of Medicine; Keystone Symposia:

Cell Biology of Virus Entry, Replication, & Pathogenesis session chair; Great Lakes Regional Center of Excellence annual meeting; **2013**: Promega Corporation; Montana State; University of Wisconsin Raper Symposium; **2014**: Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis speaker and session chair; Society of Nuclear Medicine & Molecular Imaging national meeting; Ichan School of Medicine at Mount Sinai; **2015**: University of Wisconsin La Crosse; Stanford University School of Medicine; XVI International Conference on Negative Strand Viruses; 34th American Society for Virology annual meeting speaker and session convener; **2016**: Viruses2016, Basel CHE; 35th American Society for Virology annual meeting State-of-the-Art Lecturer; 5th International Influenza Meeting, Munster, DEU (keynote lecturer); Merck (West Point, PA), Options IX (Chicago, IL); **2017**: University of Georgia, UT Austin, Harvard Medical School, Gordon Research Conference: Viruses and Cells, 36th American Society for Virology annual meeting session convener, 14th Hong Kong University – Pasteur Virology Course (Hong Kong, invited instructor), Montana State University, Duke; **2018**: University of California Berkeley 10th CEND Symposia, University of Michigan, University of Texas Southwestern, University of Arkansas for Medical Sciences, XVII International Conference on Negative Strand Viruses, University of Illinois, University of Vermont; **2019**: Dalhousie University, University of Kansas, Cornell University, Oklahoma State University, Options for the Control of Influenza X; **2020**: (postponed due to COVID19); **2021**: University of Arizona, University of Minnesota, University of Chicago, University of Washington, 40th American Society for Virology annual meeting Satellite Symposia, CZBiohub, Indiana University, University of Pittsburgh, Emory University, 8th ESWI Influenza Conference; **2022**: 41st American Society for Virology annual meeting plenary speaker and convener; Negative Strand Virus meeting (and convener); **2023**: NYU

C. Contribution to Science

Exploiting the host during infection. During viral infection, a struggle exists between the host and the virus. Cells contain antiviral factors that selectively target and inhibit viral proteins and nucleic acids, whereas viruses neutralize these inhibitors and co-opt other cellular factors necessary for their replication. The balance between these opposing forces influences the outcome of a viral infection, which ranges from abortive infections and rapid clearance, to systematic subversion of the host cell and chronic viral infection, to highly pathogenic acute infections with occasional lethality. We characterized this nexus between the HIV-1 Vif protein, the cellular antiviral protein APOBEC3G, and the host ubiquitin machinery. This theme has continued in my own group. Unbiased genetic screening identified the cellular protein EPS8 as an important factor during uncoating of incoming influenza virions. More recently, results from a genome-wide CRISPR/Cas9 knockout screen identified a large class of presumptive antiviral factors that unexpectedly act as important pro-viral enhancers. We show that one of these, IFIT2, increases translation of cellular mRNAs to support antiviral responses and explain how influenza virus uses this same activity to redirect a classically antiviral protein into a proviral effector. Our work in this area dramatically expanded our knowledge of virus:host interactions and the battle that occurs as viruses attempt to infect an unwilling host.

Mehle A, Goncalves J, Santa-Marta M, McPike M and Gabuzda D. 2004. Phosphorylation of a novel SOCS-box regulates assembly of the HIV-1 Vif-Cul5 complex that promotes APOBEC3G degradation. *Genes Dev.* 18:2861-2866. PMC534646. highlighted on the cover

Mehle A, Strack B, Ancuta P, Zhang C, McPike M and Gabuzda D. 2004. Vif overcomes the innate antiviral activity of APOBEC3G by promoting its degradation in the ubiquitin-proteasome pathway. *J Biol Chem.* 279:7792-7798.

Larson GP, Tran V, Yú S, Cai Y, Higgins CA, Smith DM, Baker SF, Radoshitzky SR, Kuhn JH, **Mehle A**. 2019. EPS8 facilitates uncoating of influenza A virus. *Cell Rep.* 29:2175-2183.e4. PMC6929677

Tran V*, Ledwith MP*, Thamamongood T, Higgins CA, Tripathi S, Chang MW, Benner C, Garcia-Sastre A, Schwemmle M, Boon AC, Diamon MS, **Mehle A**. 2020. Influenza virus repurposes the antiviral protein IFIT2 to promote translation of viral mRNAs. *Nature Microbiology.* 5(12):1490-1503. PMC7677226.

"Hacking" the viral genome to quantify influenza virus replication. Animal models have proven invaluable in understanding the *in vivo* replication of influenza virus and immune responses by the host. Existing methods for infections in animals relied on indirect measures of viral levels, or used laborious assays, and in most cases required the sacrifice of the animal, and hence the end of the experiment. There was no capacity to monitor viral dynamics in real time, severely limiting the ability to quickly screen the efficacy of antiviral treatments, the pathogenicity of emerging influenza virus, or the protection afforded by new vaccine formulations. *We have overcome these limitations by developing an influenza reporter virus suitable for in vivo imaging in the mouse and ferret models.* For the first time, our newly developed tool permits non-invasive, longitudinal measures of

viral load and dissemination within the same animal over the entire course of infection. Building on the rules we established for inserting foreign sequence, we engineered molecularly barcoded gene segments to create incredibly rich and diverse virus populations. *These barcode populations afford unprecedented quantification and resolution of population dynamics during infection*, revealing highly compartmentalized replication within a host that tempers the effects of positive selection. The papers below describe our development of these powerful new technology and highlight unexpected findings in replication dynamics, transmission and vaccination that would not have been possible using traditional approaches.

- Tran V, Moser LA, Poole DS and **Mehle A**. 2013. Highly sensitive real-time in vivo imaging of an influenza reporter virus reveals dynamics of replication and spread. *J Virol*. **87**:13321-13329. PMC3838222.
- Karlsson EA*, Meliopoulos VA*, Savage C, Livingston B, **Mehle A**#, Schultz-Cherry S#. 2015. Visualizing Real-Time Influenza Virus Infection, Transmission and Protection in Ferrets. *Nature Communications*. 6:6378. # = co-corresponding. PMC4366512.
- Czakó R, Vogel L, Lamirande EW, Bock KW, Moore IN, Ellebedy AH, Ahmed R, **Mehle A**, Subbarao K. 2017. *In Vivo* Imaging of Influenza Virus Infection in Immunized Mice. *mBio*. 8:3 e00714-17. PMC5449660.
- Amato KA, Haddock LA, Braun, KM, Meliopoulos V, Livingston B, Honce R, Schaack GA, Boehm E, Higgins CA, Barry GL, Koelle K, Schultz-Cherry S, Friedrich TC, **Mehle A**. 2022. Influenza A virus undergoes compartmentalized replication in vivo dominated by stochastic bottlenecks. 13(1):3416. 10.1038/s41467-022-31147-0.

Regulation of the influenza virus replication machinery. Influenza virus assembles large ribonucleoprotein (RNP) complexes that direct replication and transcription of the viral genome. These RNPs contain the polymerase, genomic RNA and oligomeric copies of nucleoprotein (NP). RNP formation and polymerase activity are essential for successful infection, and as such are prime targets for antiviral interventions. It is therefore critical to understand how these massive RNPs assemble and their activities are regulated. *We identified key features of both the viral polymerase and NP that are required for RNP assembly. We elucidated critical phospho-regulatory mechanisms controlling polymerase output and RNP assembly, and in some instances the specific host kinases that mediate these events.* Our data show that dynamic phosphorylation of NP is a major regulator of RNP assembly and modulates progression through the viral life cycle. The evolutionary conservation of these phospho-sites suggests that our results are broadly applicable across viral strains and genera and reveal a global regulatory strategy for *Orthomyxoviridae*. By identifying host kinases as essential partners in RNP activity, we have dramatically expanded the target space for antiviral intervention.

- Mondal A, Potts GK, Dawson AR, Coon JJ, **Mehle A**. 2015. Phosphorylation at the homotypic interface regulates nucleoprotein oligomerization and assembly of the influenza virus replication machinery. *PLOS Pathogens*. 11:e1004826. doi: 10.1371/journal.ppat.1004826. PMC4395114.
- Mondal A, Dawson AR, Potts GK, Freiberger EC, Baker SF, Moser LA, Bernard KA, Coon JJ, **Mehle A**. 2017. Influenza virus recruits host protein kinase C to control assembly and activity of its replication machinery. *eLife*. 6:e26910. doi:10.7554/eLife.26910. PMC5791932
- Dawson AR, **Mehle A**. 2018. Flu's cues: Exploiting host post-translational modifications to direct the influenza virus replication cycle. *PLOS Pathogens*. 14:e1007205. doi: 10.1371/journal.ppat.1007205. PMC6147566.
- Dawson, AR, Wilson GM, Freiberger EC, Mondal A, Coon JJ, **Mehle A**. 2020. Phosphorylation controls RNA binding and transcription by the influenza virus polymerase. *PLoS Pathogens*. 16:e1008841. doi: 10.1371/journal.ppat.1008841. PMC7494117

Crossing species barriers. Influenza viruses circulating in avian reservoirs represent a significant public health threat as a potential source of human pandemic viruses. Transmission of influenza viruses into the human population requires surmounting barriers to cross-species infection that involve a complex interplay between the virus and host. Understanding the mechanisms by which influenza viruses acquire the ability to infect multiple species is thus imperative to controlling future outbreaks. *We have shown that the influenza virus polymerase is a major determinant of viral tropism.* We further defined the molecular consequences of restriction and identified multiple adaptive strategies exploited by influenza virus as it evolves in new hosts. We have recently shown that ANP32A, a key co-factor of the viral polymerase, exhibits species-specific patterns in splicing that dictate ANP32A activity and impact viral host range and evolution. Moreover, our results provide the foundation to focus prevention efforts on the viruses most likely to establish infections in humans, and possibly exploit naturally occurring inhibitory mechanisms for general antiviral therapy.

- Mehle A** and Doudna JA. 2008. An inhibitory activity in human cells restricts the function of an avian-like influenza virus polymerase. *Cell Host Microbe*. **4**:111-122. PMC2597520. [a “Featured Article”](#)
- Mehle A** and Doudna JA. 2009. Adaptive strategies of the influenza virus polymerase for replication in humans. *Proc Natl Acad Sci U S A*. **106**:21312-21316. PMC2789757. [a “Top Story” for PNAS](#)
- Poole D, Yú S, Cai Y, Dinis JM, Müller MA, Jordan I, Friedrich TC, Kuhn JH, **Mehle A**. 2014. Influenza A virus polymerase is a hot spot for adaptive changes during experimental evolution in bat cells. *J Virol*. **88**:12572-85. PMC4248895
- Baker SF, Ledwith MP, **Mehle A**. 2018. Differential splicing of ANP32A in birds alters its ability to stimulate RNA synthesis by restricted influenza polymerase. *Cell Reports*. **24(10)**:2581-2588. PMC6157632.

Full bibliography available here: <https://www.ncbi.nlm.nih.gov/myncbi/andrew.mehle.1/bibliography/public/>.
Citation metrics are available at http://scholar.google.com/citations?user=zi6ekpQAAAAJ&hl_.

D. Research Support (full support history appended at end)

NIH NIAID R01 AI164690

02/01/2022-01/31/2027

PI = Andrew Mehle

“RNA:protein interactions that dictate the success of influenza virus infection”

Here we investigate how interactions between viral RNA and cellular proteins, and cellular RNAs and viral proteins, regulate infection.

NIH NIAID R21 AI160779

09/01/2021-8/31/2023

PI = Andrew Mehle

“Dissecting ADP-ribosylation as an innate immune response countering influenza virus replication”

This application investigates the post-translation modification ADP-ribosylation and its role during antiviral responses.

NIH NIAID R01 AI125271

07/01/2016-06/30/2021 (in an NCE until 5/31/2022)

PI = Andrew Mehle

“Regulation of the influenza virus polymerase”

Here we use biochemical approaches to understand how post-translational modifications control the influenza replication machinery.

NIH NIAID R01 AI125392 + 5R01AI125392-S1

04/01/2017-03/31/2022

co-PI = Andrew Mehle

“Mechanisms of influenza transmission bottlenecks: impact on viral evolution”

This proposal defines intra- and interhost viral evolution and its impact on disease pathogenicity and transmission.

Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Disease

07/01/2017-06/30/2023

PI= Andrew Mehle

“Defining the functional landscape between intracellular pathogens and the host”

The award funds research into understanding how canonical anti-viral proteins can be subverted to function as pro-viral effectors during infection.

Shaw Scientist Award

PI=Andrew Mehle

“Catching the flu: regulating and restricting the influenza virus polymerase”

The early career award supports our structural and genomic studies of influenza polymerase function.

Mehle CV extended honors, awards, service and full bibliography

amehle@wisc.edu • mehlelab.com • [@mehlelab](https://twitter.com/mehlelab)

Positions and Honors

Positions

- 1998-2004 **Graduate student**, Laboratory of Dana Gabuzda, MD, Division of Medical Science, Harvard University. Ph.D. thesis title: "HIV-1 Vif: a novel SOCS-box protein that targets APOBEC3G for proteasomal degradation"
- 1999 **Teaching Assistant**, Harvard University, Division of Medical Science – Molecular Biology. Coordinated by Steve Buratowski, PhD.
- 2004-2005 **Postdoctoral fellow**, Laboratory of Dana Gabuzda, MD, Dana Farber Cancer Institute
- 2005-2011 **Postdoctoral fellow**, Laboratory of Jennifer Doudna, PhD, University of California, Berkeley
- 2011-current **Assistant Professor**, Department of Medical Microbiology & Immunology, University of Wisconsin-Madison
- 2018- **Associate Professor** (with tenure), Department of Medical Microbiology & Immunology, University of Wisconsin-Madison

Honors

- 1993 Villanova University-NSF-HHMI Young Scholar
- 1996 HHMI Summer Undergraduate Research Program at the University of Pittsburgh
- 1994-1998 Presidential Scholar, Villanova University
- 1998 Phi Beta Kappa Honor Society Induction
- 1998 John McClain Award for outstanding academic performance in biology (highest rank in major), Villanova University
- 1998 Gregor Mendel Award for academic excellence in the sciences (highest rank in sciences), Villanova University
- 1998 *Summa cum laude*, Villanova University
- 1998-2001 National Science Foundation Predoctoral Fellowship
- 2004 Travel fellowship, 11th Conference on Retroviruses and Opportunistic Infections
- 2005 Travel fellowship, 12th Conference on Retroviruses and Opportunistic Infections
- 2006 Kirschstein National Research Service Award Postdoctoral Fellowship - NIGMS
- 2008 Travel fellowship, Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
- 2009 Selected speaker, Gordon Research Conference: Viruses and Cells
- 2009 K99/R00 NIH Pathways to Independence Award – NIGMS
- 2010 Selected speaker, XIV International Conference on Negative Strand Viruses
- 2010 Selected speaker, Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
- 2011 Invited speaker, Bay Area Symposia on Viruses
- 2011 Mirus Bio Research Award
- 2012 Shaw Scientist Awardee, James D. and Dorothy Shaw Fund, Greater Milwaukee Foundation
- 2012 New Investigator Awardee, Wisconsin Partnership Education and Research Committee
- 2012 Session Chair, Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
- 2014 Selected speaker, Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
- 2014 Session Chair, Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
- 2014 Invited speaker, Society of Nuclear Medicine & Molecular Imaging national meeting
- 2015 Selected speaker, XVI International Conference on Negative Strand Viruses
- 2015 Session Convener and speaker, 34th American Society for Virology annual meeting
- 2016 Selected speaker, Viruses 2016, (Basel, CHE)
- 2016 "State of the Art" Lecturer, 35th American Society for Virology annual meeting
- 2016 Invited keynote speaker, 5th International Influenza Meeting (Munster, DEU)
- 2017 Selected speaker, Gordon Research Conference: Viruses and Cells
- 2017 Invited Lecturer, 14th Hong Kong University – Pasteur Virology Course (Hong Kong)
- 2017 Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Disease
- 2018 Invited Speaker, 10th Center of Emerging and Neglected Diseases Symposia, University of California Berkeley

- 2019 Invited speaker, Options for the Control of Influenza X (Singapore)
- 2021 Invited speaker, 40th American Society for Virology annual meeting Satellite Symposia
- 2021 Elected to the American Society for Virology executive council, Councilor for Animal Virology
- 2022 plenary speaker, 41st American Society for Virology annual meeting

Seminars and Presentations

- 2008: 27th American Society for Virology annual meeting
- 2009: Gordon Research Conference: Viruses and Cells
28th American Society for Virology annual meeting
- 2010: XIV International Conference on Negative Strand Viruses
Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis
29th American Society for Virology annual meeting
- 2011: Bay Area Symposia on Viruses
University of Wisconsin Madison Virology Seminar Series
- 2012: Loyola University Stritch School of Medicine
Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis session chair
Great Lakes Regional Center of Excellence annual meeting
- 2013: Promega Corporation
Montana State University
University of Wisconsin Raper Symposium
University of Wisconsin Madison Virology Seminar Series
- 2014: Keystone Symposia: Cell Biology of Virus Entry, Replication, & Pathogenesis (and session chair)
Society of Nuclear Medicine & Molecular Imaging national meeting
Ichan School of Medicine at Mount Sinai
- 2015: Stanford University School of Medicine
XVI International Conference on Negative Strand Viruses
University of Wisconsin La Crosse
34th American Society for Virology annual meeting
- 2016: Viruses 2016, (Basel, CHE)
“State of the Art” Lecturer at 35th American Society for Virology annual meeting
Invited keynote speaker, 5th International Influenza Meeting (Munster, DEU)
Merck (West Point, PA)
Options IX (Chicago, IL)
- 2017: University of Georgia
University of Texas Austin
Harvard Medical School
36th American Society for Virology annual meeting (session convener)
Invited Lecturer, 14th Hong Kong University – Pasteur Virology Course (Hong Kong)
Gordon Research Conference: Viruses and Cells
Montana State University
Duke University
- 2018: 10th Center of Emerging and Neglected Diseases Symposia, University of California Berkeley
University of Michigan
University of Texas Southwestern
University of Arkansas for Medical Sciences
University of Illinois
University of Vermont
17th Negative Strand Virus meeting (Verona, Italy)
37th American Society for Virology annual meeting (session convener)
- 2019: Dalhousie University
Cornell University
Oklahoma State University
Options for the Control of Influenza X
University of Kansas
- 2020: University of Iowa (postponed due to COVID19)
(others postponed due to COVID19)

2021: University of Chicago
 University of Washington
 University of Arizona
 University of Minnesota
 40th American Society for Virology annual meeting Satellite Symposia
 Chan Zuckerberg Biohub
 Indiana University
 Emory University
 University of Pittsburgh
 8th European Scientific Working group on Influenza (ESWI) Influenza Conference
 2022: 41st American Society for Virology annual meeting plenary speaker
 18th Negative Strand Virus meeting (speaker and convener)

Editorial Boards and service

2010-2021 *Frontiers in Virology*, editorial board
 2012 *Ad hoc* reviewer for ICTR
 2013 *Ad hoc* reviewer for ICTR
 2014 *Ad hoc* reviewer for ICTR
 2015-2018 *Viruses*, Associate Editor
 2015- *Journal of Virology*, editorial board
 2015, 2020 *Ad hoc* reviewer for the Medical Research Council (MRC, UK)
 2015 Selection committee for international 2016 *Viruses* travel award
 2015 *Virology*, editorial board
 2016-2018 American Society for Virology Program Committee
 2016, 2021 *Ad hoc* reviewer for the Wellcome Trust (and 2016 Wellcome Trust DBT India Alliance)
 2016 *Ad hoc* reviewer for NIH Study Section – Virology A
 2017 *Ad hoc* reviewer for the Wellcome Trust (UK)
 2017 *Ad hoc* reviewer for the Agence Nationale de la Recherche (France)
 2017 *Ad hoc* reviewer for the Department of Defense Congressionally Directed Medical Research Programs
 2018 *Ad hoc* reviewer for NIH Topics in Virology – ZRG1 IDM-W (02)
 2018 *Ad hoc* reviewer for NIH Study Section – Virology A
 2018- editorial board, *Viruses*
 2018- editorial board, *PLOS Pathogens*, Pearls editor
 2019 *Ad hoc* reviewer for the Agence Nationale de la Recherche (ANR), Wellcome Trust
 2019-2022 ASM Press Committee
 2019-2023 Standing Member VirA study section
 2020- *Current Research in Virological Sciences*, founding editorial board member
 2021 *Ad hoc* reviewer: Dutch Research Council (NWO)
 2021-2024 Elected to the American Society for Virology executive council, Councilor for Animal Virology
 2022- *PLOS Biology*, Academic Editor

Ad hoc reviewer for *ACS Chemical Biology*, *ACS Infectious Diseases*, *Bioessays*, *Cell*, *Cell Host and Microbe*, *Cell Reports*, *eLife*, *Frontiers in Virology*, *Journal of General Virology*, *Journal of Virology*, *Nature*, *Nature Chemical Biology*, *Nature Communications*, *Nature Microbiology*, *Nature Structure and Molecular Biology*, *PLOS Biology*, *PLOS One*, *PLOS Pathogens*, *PNAS*, *Review Commons*, *Scientific Reports*, *Virology*, *Viruses*

Full Bibliography—Publications since starting in Madison listed below beginning at #11 and available here: <https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/40317733> and here scholar.google.com/citations?user=zi6ekpQAAAAJ&hl.

1. Gorry PR, Taylor J, Holm GH, **Mehle A**, Morgan T, Cayabyab M, Farzan M, Wang H, Bell JE, Kunstman K, Moore JP, Wolinsky SM and Gabuzda D. (2002) Increased CCR5 affinity and reduced CCR5/CD4 dependence of a neurovirulent primary human immunodeficiency virus type 1 isolate. *J Virol.* **76**:6277-6292. PMID:136234.

2. Ancuta P, Rao R, Moses A, **Mehle A**, Shaw SK, Luscinskas FW and Gabuzda D. (2003) Fractalkine preferentially mediates arrest and migration of CD16+ monocytes. *J Exp Med.* **197**:1701-1707. PMID: PMC2193954.
3. **Mehle A**, Goncalves J, Santa-Marta M, McPike M and Gabuzda D. (2004) Phosphorylation of a novel SOCS-box regulates assembly of the HIV-1 Vif-Cul5 complex that promotes APOBEC3G degradation. *Genes Dev.* **18**:2861-2866. PMID:534646.
- highlighted on the cover
4. **Mehle A**, Strack B, Ancuta P, Zhang C, McPike M and Gabuzda D. (2004) Vif overcomes the innate antiviral activity of APOBEC3G by promoting its degradation in the ubiquitin-proteasome pathway. *J Biol Chem.* **279**:7792-7798.
5. **Mehle A**, Thomas ER, Rajendran KS and Gabuzda D. (2006) A zinc-binding region in Vif binds Cul5 and determines cullin selection. *J Biol Chem.* **281**:17259-17265.
6. Gorry PR, Dunfee RL, Mefford ME, Kunstman K, Morgan T, Moore JP, Mascola JR, Agopian K, Holm GH, **Mehle A**, Taylor J, Farzan M, Wang H, Ellery P, Willey SJ, Clapham PR, Wolinsky SM, Crowe SM and Gabuzda D. (2007) Changes in the V3 region of gp120 contribute to unusually broad coreceptor usage of an HIV-1 isolate from a CCR5 Δ 32 heterozygote. *Virology.* **362**:163-178. PMID: PMC1973138.
7. **Mehle A**, Wilson H, Zhang C, Brazier AJ, McPike M, Pery E and Gabuzda D. (2007) Identification of an APOBEC3G binding site in human immunodeficiency virus type 1 Vif and inhibitors of Vif-APOBEC3G binding. *J Virol.* **81**:13235-13241. PMID: PMC2169136.
8. **Mehle A** and Doudna JA. (2008) An inhibitory activity in human cells restricts the function of an avian-like influenza virus polymerase. *Cell Host Microbe.* **4**:111-122. PMID: PMC2597520.
- selected as the "Featured Article"
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- a "Top Story" for PNAS in the News
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- selected as an "Article of Significant Interest"
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41. King CR and **Mehle A.** 2020. The later stages of viral infection: an undiscovered country of host dependency factors. *PLoS Pathogens.* **16**:e1008777
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44. Amato KA, Haddock LA, Braun, KM, Meliopoulos V, Livingston B, Honce R, Schaack GA, Boehm E, Higgins CA, Barry GL, Koelle K, Schultz-Cherry S, Friedrich TC, **Mehle A**. 2022. Influenza A virus undergoes compartmentalized replication in vivo dominated by stochastic bottlenecks. 13(1):3416. 10.1038/s41467-022-31147-0.

Full Research Support History

Current

NIH NIAID R01 AI164690

02/02/2022-01/31/2027

PI = Andrew Mehle

“RNA:protein interactions that dictate the success of influenza virus infection”

Here we investigate how interactions between viral RNA and cellular proteins, and cellular RNAs and viral proteins, regulate infection.

NIH NIAID R21 AI160779

09/01/2021-08/31/2023

PI = Andrew Mehle

“Dissecting ADP-ribosylation as an innate immune response countering influenza virus replication”

This application investigates the post-translation modification ADP-ribosylation and its role during antiviral responses.

NIH NIAID R01 AI125271

PI = Andrew Mehle

07/01/2016-06/30/2021 (NCE to 06/30/2022)

“Regulation of the influenza virus polymerase”

Here we use biochemical approaches to understand how post-translational modifications control the influenza replication machinery.

NIH NIAID R01AI125392 plus AI125392-Supplement

co-PI = Andrew Mehle

04/01/2017-03/31/2022 (NCE to 03/31/2023)

“Mechanisms of influenza transmission bottlenecks: impact on viral evolution”

This proposal defines intra- and interhost viral evolution and its impact on disease pathogenicity and transmission.

Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Disease

PI= Andrew Mehle

07/01/2017-08/30/2023

“Defining the functional landscape between intracellular pathogens and the host”

The award funds research into understanding how canonical anti-viral proteins can be subverted to function as pro-viral effectors during infection.

Shaw Scientist Award, Greater Milwaukee Foundation

PI=Andrew Mehle

07/01/2012-06/30/32

“Catching the flu: regulating and restricting the influenza virus polymerase”

The early career award supports our structural and genomic studies of influenza polymerase function.

Completed Research Support

UW Madison Fall Competition 2021

PI = Andrew Mehle

“RNA:protein interactions that dictate the success of influenza virus infection” (selected for funding, declined upon activation of R01)

NIH NIAID R21 AI125897

PI = Andrew Mehle

“Identifying host factors and the mechanisms used to control influenza virus replication”

This exploratory grant funds studies to determine the mechanisms by which influenza virus exploits anti-viral factors and apoptosis to maximize viral replication.
ended 5/31/19

UW2020 Initiative

PI = Andrew Mehle

“Genomic Approaches to Identify Host Factors and Mechanisms that Modulate Pathogen Infections”

This project develops new genetic approaches to identify critical host factors exploited by pathogens during infection.

ended 03/31/2017

Roche Postdoctoral Fellowship

PI/Mentor = Andrew Mehle

“Functional characterization of host factors the control influenza polymerase activity”

This award provides funds for a joint postdoctoral research in the lab of Dr. Mehle and Roche.

ended 1/14/17

American Lung Association Basic Research Grant RG-310016

PI=Andrew Mehle

“Understanding the role of inflammation during influenza virus-mediated lung damage”

ended 5/31/2016

UW Madison Fall Competition 2015

PI= Andrew Mehle

“Defining host factors that regulate and restrict the influenza virus polymerase” (selected for funding, declined upon activation of R01)

K99GM88484/R00GM088484 Pathways to Independence + Administrative Supplement to Promote Diversity

PI=Andrew Mehle

“Regulating Influenza Polymerase Structure and Function by Phosphorylation”

ended 12/31/2015

New Investigator Program – Wisconsin Partnership Education and Research Committee (#2563)

PI =Andrew Mehle

“Dissecting Cross-Species Transmission of Influenza Virus”

ended 12/31/2014

Kirschstein National Research Service Award Postdoctoral Fellowship F32GM077931

PI=Andrew Mehle

“Structure And Activity Of A Cellular IRES Element”

ended 4/6/2009

NSF Graduate Research Predoctoral Fellowship

PI = Andrew Mehle

ended August 2001

Teaching Summary

Course	Year	Enrollment	Lectures/year
MMI/BIOCHEM575: Biology of Viruses	Spring 2013	77	~9-11 (50 min)
	Spring 2014	105	
	Spring 2015	61 ^b	
	Spring 2016 ^a	45	
	Spring 2017 ^a	59	
	Spring 2018	60	
	Spring 2019	35	
	Spring 2020 ^a	55	

	Spring 2021 ^a	81	
	Spring 2022	28	
14 th Hong Kong University – Pasteur Virology Course	Summer 2017	27	1 (2 hr)
MMI750: Virus Host Interactions in Vertebrate Viral Disease	Spring 2016	~10	1 (90 min)
	Spring 2014	~10	2 (90 min)
BIG Ideas Seminar Series	Summer 2013	~25	1 (90 min)
	Summer 2014	~25	
MMI810: Topics in Microbiology	Fall 2012	16	2 (50 min)

^aCourse Director as well as instructor for 2016 and 2017; ^bwith the elimination of the MMI major, MMI575 was no longer a required course for graduation and the class size adjusted accordingly.

University Service

2011 – current	Graduate student thesis committee member outside of my lab: 16 completed, 13 ongoing
2011 – 2012	Microbiology Doctoral Training Program Admission Committee
2012 – 2014	ICTR <i>ad hoc</i> reviewer
2012 – 2015	<i>Chair</i> , Microbiology Doctoral Training Program Admission Committee
2012 – current	Medical Microbiology and Immunology Curriculum Committee
2014	Award selection committee, Raper Symposia
2016 – 2019	Faculty Advisor to incoming Microbiology Doctoral Training Program class
2017	MMI Faculty Search and Recruitment Committee
2018	Pathways to Promotion Tenure Track Workshop speaker
2018, 19, 21	Virology Cluster Hire Faculty Search and Recruitment Committee
2018 – 2019	Cellular and Molecular Biology Admissions Committee
2020 – current	<i>Chair</i> , Cellular and Molecular Biology Admissions Committee
2020 – current	Pre-tenure Teaching Evaluator for MMI
2021 – 2022	<i>Research Forward</i> review committee
2021 – current	Faculty mentoring committee for Adam Bailey, also mentor for his NIH Director's Early Independence Award (DP5)
2022	Chair search committee, Department of Pediatrics

Trainees

Lab Member	Position ^a	Dates	Degree (current position)
James Kirui	graduate student (CMB)	2011-2016	PhD, NIH postdoc
Daniel S. Poole	lab manager	2011-2015	
Cait Hamele	undergraduate research	2012-2014	BS, Duke graduate school
Chris Andrews	undergraduate research	Summer 2012, 2013	BS
Vy Tran	graduate student (MDTP) MBTG Trainee ^b	2013-2016	PhD, medical liaison NovoNordisk
	Postdoctoral Fellow	2016-2017	
Arindam Mondal	Postdoctoral Fellow	2013-2016	Assistant Professor, IIT Kharagpur
Katie Welsh	student hourly	2013-2014	BS
Michael Donohue	undergraduate research	Summer 2013	graduate student Medical College of Wisconsin
Danielle Marie Smith	student hourly	2014-2015	BS, nursing school CU Ft Collins, currently a nurse
	undergraduate research	2015-2016	
Olivia Cottrell	undergraduate research	2014-2015	BS, ibidi
Gloria Larson	graduate student (MDTP) VTG Trainee ^c	2014-2019	PhD, ORISE Fellow CDC
	Postdoctoral Fellow	2020	
Anthony Dawson	graduate student (CMB) VTG Trainee ^c	2014-2020 2020	PhD, postdoc at NEB
	Postdoctoral fellow		
Steven Baker	Postdoctoral Fellow MHD Trainee ^d	2015-2021	Assistant Professor, Lovelace Biomedical Research Institute

Jonathan Divito	student hourly undergraduate research	2016-2017 2017-2018	BS
Grace Schaack	rotating student (MSTP) MD/PhD Student (MSTP) ^{e,f}	Summer 2016 2018-	in progress
Katie Amato	graduate student (MDTP) MBTG Trainee ^b	2016-2021	scientist, Genentech
Mitch Ledwith	graduate student (CMB)	2016-2022	bioinformatician, La Jolla Labs
Arianna Domek	student hourly	2017-2018	
Christina Higgins	lab manager	2017-2019	graduate student at NYU
Kaitlin Davis	Postdoctoral Fellow	2018-2020	program officer Additional Ventures
Cason King	LSRF Postdoctoral fellow	2018-	in progress
Collin Mowbray	student hourly	2018-2019	BS
Elizabeth Feltman	lab manager	2019-2022	lab manager, industry
Abigayle Hoover	undergraduate research	2019-2020	BS, NIH IRTA post-bac
Supasek Kongsomros	international research intern	2019-2020	Mahidal University
Owen Sullivan	graduate student (CMB)	2020-	in progress
Jordan Ranmum	undergraduate research, research intern	2020-2021 2021-	BS in progress
Thomas Nipper	graduate student (MDTP)	2021-	in progress
Zhenyu Zhang	Research associate	2022-	In progress

^aMDTP = Microbiology Doctoral Training Program; MSTP = Medical Scientist Training Program; CMB = Cell and Molecular Biology Graduate Program, ^bMolecular Biology Training Grant (T32GM07215), ^cVirology Training Grant (T32AI078985), ^dMicrobes in Health and Disease (T32AI055397), ^eRath 4-year Fellowship, ^fParasite Vector Biology Training Grant

Presentations by lab members

- 2012: James Kirui* (graduate student) – talk at the American Society for Virology annual meeting
- 2013: James Kirui (graduate student) and Vy Tran (graduate student) – posters at the American Society for Virology annual meeting
Vy Tran (graduate student) – talk in the University of Wisconsin Madison Virology Seminar Series
- 2014: Vy Tran (graduate student), Arindam Mondal (postdoc), Daniel Poole[#] (research scientist) – talks at the American Society for Virology annual meeting
James Kirui (graduate student) – University of Wisconsin Madison Virology Seminar Series
- 2015: Vy Tran (graduate student) – talk in the MDTP seminar series
Arindam Mondal (postdoc) – poster at the Gordon Research Conference: Viruses and Cells, University of Wisconsin Madison Virology Seminar Series, job interview for a faculty position at the India Institute of Technology
- 2016: Arindam Mondal (postdoc), Steve Baker (postdoc), Gloria Larson* (graduate student) and Tony Dawson* (graduate student) – talks at the American Society for Virology annual meeting; Gloria Larson (graduate student) gave a talk at the annual Wisc-e-sota UW/UMN virology symposia; Tony Dawson (graduate student) received the “best poster” prize at the Wisc-e-sota meeting
- 2017: Steve Baker* (postdoc), Gloria Larson (graduate student) and Tony Dawson (graduate student) – talks at the American Society for Virology annual meeting
Gloria Larson (graduate student) – Cell Symposia: Emerging and re-emerging viruses, poster
Steven Baker* – talk at 6th European Science Working group on Influenza (Latvia)
- 2018: Gloria Larson* (graduate student), Mitch Ledwith* (graduate student) and Tony Dawson* (graduate student) – talks at the American Society for Virology annual meeting
Steven Baker* – Keystone Symposia: Cells vs. Pathogens: Intrinsic Defenses and Counterdefenses (poster); Gloria Larson (graduate student) gave a talk at the annual Wisc-e-sota UW/UMN virology symposia; Tony Dawson (graduate student) received the “best poster” prize at the Wisc-e-sota meeting
- 2019: Gloria Larson** (poster) and Tony Dawson** (talk) - Gordon Research Conference: Viruses and Cells
Gloria Larson (graduate student), Mitch Ledwith (graduate student), Tony Dawson (graduate student), Steve Baker* (postdoc), Kaitlin Davis* (postdoc) – talks at the American Society for Virology annual meeting. Katie Amato also presented a poster; Kaitlin Davis (postdoc) – talk at the annual Wisc-e-sota UW/UMN virology symposia

- 2020: Mitch Ledwith (graduate student) – poster at Viruses2020, Barcelona and talk at Wisc-e-sota UW/UMN virology symposia. Five talks for ASV 2020 were canceled due to COVID19. Katie Amato, Cason King, Steven Baker – flash talk/poster at Wisc-e-sota
- 2021: Steven Baker (postdoc) – virtual talk at the European Scientific Working Group on Influenza (ESWI); Steve Baker (postdoc), Cason King* (postdoc), Grace Schaack (graduate student), Katie Amato* (graduate student) – talks at the American Society for Virology annual meeting; Katie Amato – talk at the Midwest Population Genetics VI.
- 2022: Cason King (postdoc) – Negative Strand Virus meeting

* travel award recipient, # UW Madison career development grant, ** UW travel grant recipient