Kristopher J. Koudelka

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Education

Ph.D. The Scripps Research Institute, La Jolla, CA **2004-2008**
Tracks: Biology and Chemical Biology
Thesis Title: *Elucidation of Mammalian Binding and Entry of Cowpea Mosaic Virus Via Surface Vimentin; Implications for Nanotechnology and Virus Evolution*

B.A. University of Wisconsin-River Falls, River Falls, WI **1999-2003**
Major: Biology; Minor: Chemistry

Academic History

Full Professor
Point Loma Nazarene University, San Diego, CA **2020-Present**
Department of Biology

Associate Professor
Point Loma Nazarene University, San Diego, CA **2016-2020**
Department of Biology

Assistant Professor
Point Loma Nazarene University, San Diego, CA **2014-2016**
Department of Biology

Assistant Professor
Carthage College, Kenosha, WI **2010-2014**
Department of Chemistry and Department of Biology

Visiting Assistant Professor **2008-2010**
University of San Diego, San Diego, CA
Department of Chemistry and Biochemistry

Administrative Roles

PLNU COVID-19 Medical Team Co-Lead

- Developed health and campus policy in partnership with campus clinicians
- Created and directed on-site COVID-19 PCR testing lab for onboarding and weekly surveillance
- Wrote internal and external campus communications
- Created campus educational videos, white papers, and policy documents
- Presented and answered live questions at regular virtual campus town halls for students, parents of students, faculty, and staff
- Mentored and developed science students, nursing students, faculty, nurses, and clinicians

- Advised university President and Administration through weekly briefings and regular updates at Cabinet leadership meetings
- Bridged independent school of nursing with the biology department and student wellness center
- Responded directly to concerned faculty, staff, students, and alumni
- Partnered with Human Resources to host small group conversations and feedback sessions
- Supported organization of campus vaccination clinics
- **Key Successes:** Undergraduate Spring semester was almost entirely face-to-face, with near capacity residence halls, robust student life activities and a campus COVID positivity rate which remained less than half of the surrounding community rate. PLNU was the most "open" college campus in San Diego County and much of Southern California, resulting in significant student retention and maintained revenue

PLNU COVID-19 Testing Director

- Established, troubleshot, and implemented Saliva Direct pooled COVID-19 PCR testing procedure
- Managed personnel, training, and ordering
- Complete budget management
- Coordinated with the County of San Diego's Health and Human Services Agency (HHSA) to approve testing
- Created 12 medically and industry relevant undergraduate internships per semester
- During Spring 2021 ran over 8,000 tests, at a net cost savings of $300,000-$400,000
- Scaled weekly testing capacity to 2,400 tests/week for Fall 2021
- Initiated and developed a partnership to complete Fall 2021 COVID-19 testing for an additional local university (Commercial value $1.25-$1.75 million dollars)
- **Key Successes:** Same day COVID-19 test results, approximately 1/3 of all Spring campus cases were caught asymptomatically or pre-symptomatically through surveillance testing which reduced community spread, influential local university partnership strengthened

Creation of PLNU Experience Scotland Program

- Created and sustaining partnership with Experience Scotland
- Allows students to engage in a robust international, residential experience
- Enables rotation of PLNU professors on-site in Scotland, using the curriculum of their choice
- Supports the ability for more science majors to study abroad, and receive campus science credit
- Net PLNU tuition gain averaging $7,000 per student enrolled in Experience Scotland
- PLNU receives $19,500 to help offset costs of sending first faculty member
- **Key Successes:** Residential international option that supports both PLNU students and faculty, both curricularly and financially beneficial to the University

PLNU Faculty Council

- Faculty elected position
- Highest honored faculty committee
- Publicly and/or confidentially ascertained the concerns of the faculty and developed programs of improvement
- **Key Successes:** COVID-19 teaching modality support (remote, near/far, and hybrid), COVID-19 personal faculty support (home schooling, remote access, etc), improve faculty input into ongoing departmental realignments, continued developmental work on campus diversity statement and policies, solving individual faculty grievances

PLNU Research Associates Faculty Co-Lead

- Research Associates is an alumni group, who all previously participated in summer undergraduate research at PLNU
- Raised funds are specifically designated to support student summer research and yearly scholarships
- Annual giving over the last five years has increased from ~$50,000/yr to ~$80,000/yr
- Increased electronic communications
- Instituted early recruitment drive for recent graduates
- **Key Successes:** increased overall giving, transition to establishment of an endowment to maximize long-term funding stability

Organizer for the Annual West Coast Biological Sciences Undergraduate Research Conference

- Regular hosting and coordination of research conference at PLNU (~500 attendees, keynote speaker, ~100 oral presentations, ~150 poster presentations)
- Support hosting of conference at other campuses
- Direct communications and conference advertising
- **Key Successes:** continued strong stability of 40+ year conference that focused exclusively on undergraduate science research

Teaching Activities

Instructor of Record – Point Loma Nazarene University **2014-Present**

Cell Biology and Biochemistry Lecture, Cell Biology and Biochemistry Lab, Molecular Biology Lecture, Molecular Biology Lab, Research Methodology, Biochemistry Lecture, Biochemistry Lab, Molecular Biology of Infectious Disease, Biotechnology and Society, Masters Level Genetics and Molecular Biology.

Instructor of Record – Carthage College **2010-2014**

Genetics Lecture, Genetics Lab, Energetics and Strength, Senior Chemistry Thesis, Biochemistry Lecture, Biochemistry Lab, General Chemistry Lecture, General Chemistry Lab.

Instructor of Record – University of San Diego **2008-2010**

DNA Science and Technology, Molecular Biology, General Chemistry.

High School Outreach Instructor – The Scripps Research Institute **2005-2009**

Continuing education Virology and Forensics Science classes for high school teachers and students.

High School Outreach Curriculum Coordinator – The Scripps Research Institute **2007-2008**

Organization of classes taught by outreach programs for high school educators and high school students.

Research Experience

Principle Investigator – PLNU/Carthage College **2010-Present**
Projects: (I) Modification of non-mammalian viruses for use as adaptive drug delivery vehicles. (II) Mammalian specific uptake of non-host viruses. (III) Sequencing viral diversity within the course of an infection.

Research Consultant – Thermagen LLC **2012-2014**
Goal: Provide undergraduates with research experiences externally supported by industry partners.

Postdoctoral Researcher – University of California – San Diego **2008-2010**
Principle Investigator: Marianne Manchester, Ph.D.
Projects: (I) Development of bacteriophage lambda procapsids for use as a novel nanoscaffold for biomedical applications. (II) Structural elucidation of the binding interface between cowpea mosaic virus and vimentin.

Doctoral Candidate – The Scripps Research Institute **2005-2008**
Advisor: Marianne Manchester, Ph.D.
Project: Identification and characterization of mammalian cell surface binding proteins for cowpea mosaic virus nanoparticles; applications for human vascular imaging agents, vaccine development, targeted drug delivery, and picornavirus evolution.

Graduate Rotation – The Scripps Research Institute **Fall 2004**
Advisor: Erica Ollmann Saphire, Ph.D.
Project: Work toward the crystallization and structural elucidation of dengue virus envelope protein, and nipah virus V and W proteins.

Interim Biology Lab Manager – University of Wisconsin – River Falls **Summer 2004**
Reagent preparation for laboratory classes, equipment maintenance, and management of 2-3 work-study students.

Undergraduate Lab Researcher – University of Wisconsin – River Falls **2003-2004**
Advisor: E. Katherine Miller, Ph.D.
Project: Hyperthermic cellular expression of heat shock proteins HSP70, HSC70, and GRP78 in murine brain and lung.

Undergraduate Lab Researcher – University of Wisconsin – River Falls **Spring 2001**
Advisor: Karl Peterson, Ph.D.
Project: Product separation of palladium-catalyzed stereospecific reactions.

Service

PLNU COVID-19 TUG/GPS/CEL Task Force **2020-Present**
Charge: Predict, prepare, train, and inform faculty of changes to teaching, scholarship, and policies in response to COVID-19 pandemic.

Pre-Health Interviewer **2020-Present**
Charge: Review application materials and interview pre-health students to prepare them for the graduate interview process.

PLNU Program Assessment and Review Committee **2018-Present**
Charge: Assess, evaluate, and provide constructive feedback on program performance and educational quality assurance.

Western Institutional Review Board Biosafety Committee Member **2017-Present**
Charge: Review, investigate, evaluate, and provide feedback concerning compliance of companies and institutions to NIH Biosafety Guidelines.

Reviewer for Discipline Specific Journals and Conferences **2014-Present**
Charge: Evaluate the scientific merit of publications and presentations for Biomacromolecules, ACS Applied Materials and Interfaces, Nanotheranostics, WIRE Nanomedicine, Archives of Virology, Molecular Pharmaceutics, NCUR Proceedings, American Biology Teacher, and Posters on the Hill.

PLNU J-Term Vocation Planning Group **Fall 2020**
Charge: Help organize vocational content for TUG students to increase engagement to calling during the J-Term.

PLNU Summer Governance Committee **Summer 2020**
Charge: Temporarily serves as full faculty representation to respond over the summer to urgent issues due to COVID-19.

PLNU Faculty Mentor for New Faculty **2018-2019**
Charge: Educate, advise, and regularly meet with new faculty member to aid in transition into tenure-track employment at PLNU.

Biology Representative for the Student Success Collaborative (SSC) **2015-2019**
Charge: Aid and train biology faculty members in the use of the SSC advising platform.

PLNU Graduate and Extended Studies Committee **2016-2017**
Charge: Review, assess, and make recommendations to the faculty concerning graduate and extended studies policies, and programs.

PLNU Faculty Resource Committee **2015-2016**
Charge: Evaluate and rank grant and sabbatical proposals.

Bio-Chem Program Review Member **2015-2016**

Charge: Evaluation of the Bio-Chem major's strengths and weakness, and investigation of possible future improvements and curriculum changes.

Leadership in Higher Education Strategic Planning Group **Spring 2014**

Charge: Articulate development plan to position Carthage as an innovative leader in higher education through leveraging the College's strengths, enhancing visibility, and developing signature programming.

Chemistry search committee member **Spring 2014**

Charge: Evaluate, screen, and recruit a chemistry tenure-track faculty member.

Faculty advisor for the student service organization Carthage World Relief **2011-2014**

Charge: Guide and participate in group's mission to increase awareness of global health initiatives and actively partake in projects that increase healthcare for those in need due to disaster or poverty.

Chemistry thesis archivist **2010-2014**

Charge: Inventory and maintain senior theses from the chemistry department both electronically and in print.

Nursing Advisory Committee **Fall 2013**

Charge: Explore strengths, opportunities, and concerns for the possible addition of a nursing program at Carthage College.

Textbook reviewer **Summer 2013**

Charge: Evaluate, advise, and edit seven chapters for a new text publication entitled, "Modern Molecular Biology: Genomes to Proteomes" by Garland Science.

Chemistry search committee member **Spring 2013**

Charge: Evaluate, screen, and recruit a chemistry term faculty member.

Honors and Professional Affiliations

Member, Council on Undergraduate Research **2011-Present**

Member, American Society for Virology **2006-Present**

Member, Sigma Xi **2011-2014**

The Joint USD-Scripps Training for Future Faculty Members (JUST) Post-Doctoral Fellowship **2008-2010**

Member, American Academy of Nanomedicine **2007-2010**

ARCS Foundation Scholar **2007-2008**

Research Articles

6. Page D, King JK, Maskiewicz, T, and **Koudelka KJ.** Effectiveness of bi-weekly COVID-19 pooled PCR surveillance testing on a residential undergraduate campus during Spring 2021. (In Preparation).

5. **Koudelka KJ,** Ippoliti S*, Medina E, Shriver LP, Trauger SA, Catalano CE, and Manchester M. Lysine addressability and mammalian cell interactions of bacteriophage lambda procapsids. Biomacromolecules. 2013 Dec 9; 14(12):4169-76. PMID: 24251756.

4. Shriver LP, **Koudelka KJ,** and Manchester M. Viral nanoparticles associate with regions of inflammation and blood brain barrier disruption during CNS infection. J Neuroimmunol. 2009 Jun 25; 211:66-72. PMID: 19394707.

3. **Koudelka KJ,** Destito G, Plummer EM, Trauger SA, Siuzdak G, and Manchester M. Endothelial targeting of cowpea mosaic virus (CPMV) via surface vimentin. PLoS Pathog. 2009 May; 5(5). PMID: 19412526.

2. Rae CS, **Koudelka KJ**, Destito G, Estrada MN, Gonzalez MJ, and Manchester M. Chemical addressability of ultraviolet-inactivated viral nanoparticles (VNPs). PLoS ONE 2008 Oct 2; 3(10). PMID: 18830402.

1. **Koudelka KJ,** Rae CS, Gonzalez MJ, and Manchester M. Interaction between a 54kD mammalian cell surface protein and cowpea mosaic virus. J. Virol. 2007 Feb; 81(4): 1632-40. PMID: 17121801.

* = Mentored undergraduate author

Research Reviews

3. **Koudelka KJ,** Pitek A, Manchester M, and Steinmetz N. Virus-based nanoparticles as versatile nanomachines. Annu Rev Virol. 2015 Nov; 2(1): 379-401. PMID: 26958921.

2. **Koudelka KJ,** and Manchester M. Chemically modified viruses: principles and applications. Curr Opin Chem Biol. 2010 Dec; 14(6): 810-7. PMID: 21036656.

1. **Koudelka KJ,** and Manchester M. Book Chapter: The Use of Viruses in Biomedical Nanotechnology. Emerging Topics in Physical Virology, Imperial College Press, 2010.

Published Teaching Materials

2. **Author for Albert.io General Biology, Biochemistry, and Chemistry Sections.** Created rigorous, application-based questions with thorough solutions, and advanced instructor analytics.
August 2016 – July 2018

1. **Created and Published Interactive Online Teaching Modules for the Text: Molecular Biology – Structure and Dynamics of Genomes and Proteomes.** ISBN: 9780815345046. August 2017

National Oral Presentations

8. **Koudelka KJ.** National COVID-19 Vaccination Education Town Hall. American Society for Virology. Zoom. May 2021

7. **Koudelka KJ**. Integration of a Virology-Based Research Agenda into a Mid-Majors Course at a Primarily Undergraduate Institution. America Society for Virology Annual Meeting, 2019, Minneapolis-St. Paul, Minnesota. *Undergraduate Teacher Travel Grant Awardee*

6. **Koudelka KJ**, Morin J*, Ziegler M*, Rowley N*, and Koshland K*. Dual Modified Bacteriophage Lambda Procapsids Designed for Targeted Cellular Delivery. America Society for Virology Annual Meeting, 2017, Madison, Wisconsin. *Undergraduate Teacher Travel Grant Awardee*

5. **Koudelka KJ,** Ippoliti S*, Medina E, Shriver LP, Trauger SA, Kent R*, Catalano CE, and Manchester M. Chemical addressability and mammalian interactions of bacteriophage lambda procapsids. American Society for Virology Annual Meeting, 2012, Madison, Wisconsin.

4. **Koudelka KJ,** Ippoliti S*, Medina E, Shriver LP, Trauger SA, Siuzdak G, Catalano CE, and Manchester M. Bacteriophage lambda as a novel nanoparticle: chemical addressability of procapsids, and procapsid-mammalian cell interactions. American Society for Virology Annual Meeting, 2010, Bozeman, Montana.

3. **Koudelka KJ,** Plummer EM, Destito G, Trauger SA, Siuzdak G, and Manchester M. Vascular endothelial targeting of cowpea mosaic virus using cell surface vimentin. American Society for Virology Annual Meeting, 2009, Vancouver, Canada.

2. **Koudelka KJ,** Destito G, Trauger SA, Siuzdak G, and Manchester M. Cell surface-exposed vimentin is a receptor for cowpea mosaic virus in mammalian cells. International Congress of Virology, 2008, Istanbul, Turkey.

1. **Koudelka KJ,** Rae CS, Gonzalez MJ, and Manchester M. Plant Virus-Based Nanoparticles Interact Specifically With a Mammalian Cell Surface Receptor. American Society for Virology Annual Meeting, 2006, Madison, WI.

* = Mentored undergraduate author

Mentored Students' Presentations

25. Jones, N*, and **Koudelka KJ.** Cowpea Mosaic Virus Sequence Analysis over the Course of an Infection in Cowpea Plant. PLNU Senior Honor's Thesis. 2021.

24. Culver, R*, Julio A*, and **Koudelka KJ.** *In Vitro* Assembly of Bacteriophage Lambda Procapsid to Enable Payload Encapsulation for Targeted Drug Delivery. PLNU Senior Honor's Thesis. 2019.

23. Salgado B*, **Koudelka KJ**, and Shresta S. The Role of the Tumor Necrosis Factor Superfamily Members on Regulation of T Cell Response in Zika Virus. PLNU Senior Honor's Thesis. 2019.

22. Culver, R*, Julio A*, and **Koudelka KJ.** *In Vitro* Assembly of Bacteriophage Lambda Procapsid to Enable Payload Encapsulation for Targeted Drug Delivery. 44th West Coast Biological Sciences Undergraduate Research Conference, 2019, San Diego, CA.

21. Salgado B*, **Koudelka KJ**, and Shresta S. Regulation of T Cell Responses to Zika Virus Infection Through the Tumor Necrosis Factor Superfamily Members OX40 and GITR. 44th West Coast Biological Sciences Undergraduate Research Conference, 2019, San Diego, CA.

20. Avila D*, Banning G*, Julio A*, Roser T*, and **Koudelka KJ.** Assembly and Surface Modification of Viral Nanoparticles. 44th West Coast Biological Sciences Undergraduate Research Conference, 2019, San Diego, CA.

19. Julio A*, Roser T*, Morin J*, Ziegler M*, and **Koudelka KJ**. Assembly and Surface Modification of Viral Nanoparticles for Chemotherapeutic Drug Delivery. 43rd West Coast Biological Sciences Undergraduate Research Conference, 2018, Moraga, CA.

18. Morin J*, Ziegler M*, Rowley N*, Koshland K*, and **Koudelka KJ**. Modification to Bacteriophage Lambda Procapsids to Create a Targeted Therapeutic Delivery System. 42nd West Coast Biological Sciences Undergraduate Research Conference, 2017, Santa Clara, CA. *Honorable Mention, Best Talk in Section.*

17. Rowley N*, and **Koudelka KJ**. The Investigation of Cancer Cell Surface Proteins that Interact with Phage Procapsids. PLNU Senior Honor's Thesis. 2016.

16. Hatley K*, Perez B*, Van Horne S*, Feghali P*, and **Koudelka KJ**. Lambda Procapsids Have High Structural Stability, and Great Potential for Drug Delivery. 41st West Coast Biological Sciences Undergraduate Research Conference, 2016, San Diego, CA.

15. Rowley N*, Koshland K*, and **Koudelka KJ**. Modified Bacteriophage Lambda Procapsids for Use as a Drug Delivery Platform. 41st West Coast Biological Sciences Undergraduate Research Conference, 2016, San Diego, CA. *Best Talk in Section.*

14. Krings L*, Fenske H*, Jefferson D*, Machurick M*, and **Koudelka KJ.** Analysis of Bacteriophage Lambda Procapsids for Use as a Viral Nanoparticle for Early Cancer Detection and Targeted Delivery. Undergraduate Research Symposium in Biological Sciences and Psychology, 2014, Chicago, IL.

13. Fenske H*, Jefferson D*, Krings L*, Machurick M*, and **Koudelka KJ.** Visualization of Internalized Viral Nanoparticles (VNPs) for Imaging and Early Cancer Detection. 28th National Conference on Undergraduate Research (NCUR), 2014, Lexington, KY.

12. Fenske H*, Jefferson D*, Krings L*, Machurick M*, and **Koudelka KJ.** Visualization of Internalized Viral Nanoparticles (VNPs) for Imaging and Early Cancer Detection. Celebration of Scholars, 2014, Carthage College, Kenosha, WI.

11. Eschbach, J*, Goetz M*, Egner J*, Kendal E*, **Koudelka KJ,** and Martino P. The Effects of Whey Protein, Gatorade, and Creatine on Strength and Over-All Health. Celebration of Scholars, 2014, Carthage College, Kenosha, WI.

10. Fenske H*, Jefferson D*, and **Koudelka KJ.** Intracellular Visualization of Internalized Virus-Based Delivery Vehicles. Undergraduate Research Symposium in Biological Sciences and Psychology, 2013, St. Louis, MO.

9. Fenske H*, Machurick M*, and **Koudelka KJ.** Dye Modified Virus-Based Nanoplatforms for Cancer Imaging. 27th National Conference on Undergraduate Research (NCUR), 2013, La Crosse, WI.

8. Fenske H*, Machurick M*, and **Koudelka KJ.** Modified Viral Nanoparticles as Cancer Detecting Imaging Devices. Celebration of Scholars, 2013, Carthage College, Kenosha, WI.

7. Machurick M*, Fenske H*, and **Koudelka KJ.** Dye Modified Virus-Based Nanoplatforms for Cancer Imaging and Advanced Therapeutics. Celebration of Scholars, 2013, Carthage College, Kenosha, WI.

6. Seiler GS*, Weber M, and **Koudelka KJ.** Exploring Issues In Protein Quantitation by Visible Spectroscopic Techniques. Celebration of Scholars, 2013, Carthage College, Kenosha, WI.

5. Kendl E*, **Koudelka KJ,** and Martino P. Workout Supplementation and Their Effects on Strength and Body Gains. Celebration of Scholars, 2013, Carthage College, Kenosha, WI.

4. Fenske H*, Machurick M*, and **Koudelka KJ.** Chemical Modification of Cowpea Mosaic Virus (CPMV) to Create Advanced Cancer Therapeutics. Undergraduate Research Symposium in Biological Sciences and Psychology, 2012, Chicago, IL.

3. Kent R*, and **Koudelka KJ.** Characterization and Chemical Modification of Cowpea Mosaic Virus (CPMV). Celebrations of Scholars, 2012, Carthage College, Kenosha, WI.

2. Egner J*, **Koudelka KJ,** and Martin P. Evaluating the Effect of Carbohydrate-Electrolyte, Whey Protein, and Creatine Monohydrate Supplementation with Resistance Training. Celebration of Scholars, 2012, Carthage College, Kenosha, WI.

1. Ippoliti S*, and **Koudelka KJ.** Bacteriophage Lambda: Amine Specific Labeling and Evaluation of Mammalian Cell Interactions. Creative Collaborations, 2011, University of San Diego, San Diego, CA.

* = Mentored undergraduate author

Invited Panelist

5. Vaccine and Ethics, PLNU Science and Religion Club Presentation, 2021.

4. Loma Talks – COVID-19, Point Loma Nazarene University, 2020.

3. Biomolecular Visualization Workshop, University of San Diego, 2018.

2. Academic Career Roundtable, The Scripps Research Institute, 2016.

1. Graduate Program Alumni Symposium, The Scripps Research Institute, 2015.

External Awards and Honors

American Society for Virology Undergraduate Teacher Travel Grant	**2017 and 2019**
Auxin Partners Grant	**2012**
ARCS Foundation Scholar	**2007-2008**

Church

St. Agnes Catholic Church

Parishioners and Confraternity of Christian Doctrine