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## Education/Training/Professional Appointments

|           |   |
|-----------|---|
| 2019-pres | Associate Professor, Purdue University, Department of Biological Sciences   |
| 2014-2019 | Assistant Professor, Purdue University, Department of Biological Sciences   |
| 2008-2014 | Postdoctoral Fellow, NIDDK/NIH, Dr. Susan Buchanan  |
| 2003-2008 | PhD, Department of Molecular and Cellular Biochemistry, University of Kentucky College of Medicine, University of Kentucky, Dr. David Rodgers |
| 1999-2003 | B.A. in Chemistry, Berea College, Dr. Lee Roecker<br>B.A. in Mathematics, Berea College, Dr. Jan Pearce                                       |
| 2001-2002 | Certificate in Thai Studies, Payap University, Chiang Mai, Thailand   |

## Honors and Awards

2019 Purdue University Faculty Scholar  
2019 College of Science Mentoring Award  
2018 Excellence in Research Award  
2017 College of Science Team Award  
2013 Fellows Award for Research Excellence (FARE) Award Winner  
2012 Fellows Award for Research Excellence (FARE) Award Winner  
2008 Member of the Delta Epsilon Iota Academic Honor Society  
2007 X-Ray Methods in Structural Biology, Cold Spring Harbor Laboratory (Full Scholarship)  
2006 Best Poster - University of Kentucky Molecular and Cellular Biochemistry Symposium  
2006 National Institute on Drug Abuse (NIDA) Training Grant (2-years)  
2006 American Crystallographic Association Annual Meeting Travel Award  
2004 National Institute on Drug Abuse (NIDA) Training Grant (2-years)  
2003 Class of 1953 Chemistry Scholarship Award, Berea College

## Professional Memberships

|           |  |
|-----------|--|
| 2006-pres | American Crystallographic Association  |
| 2014      | International Union of Crystallography |
| 2012      | American Society for Microbiology      |

## Peer-Reviewed Publications (since joining Purdue) (\*contributed equally, <sup>1</sup>corresponding author)

23. Celia H, **Noinaj N**, Buchanan SK. Structure and Stoichiometry of the Ton Molecular Motor. *Int J Mol Sci* (2020) 21(2). pii: E375.
22. Imai Y, Meyer KJ, Iinishi A, Favre-Godal Q, Green R, Manuse S, Caboni M, Mori M, Niles S, Ghiglieri M, Honrao C, Ma X, Guo JJ, Makriyannis A, Linares-Otoya L, Böhringer N, Wuisan ZG, Kaur H, Wu R, Mateus A, Typas A, Savitski MM, Espinoza JL, O'Rourke A, Nelson KE, Hiller S, **Noinaj N**, Schäberle TF, D'Onofrio A, Lewis K. A new antibiotic selectively kills Gram-negative pathogens. *Nature* (2019) 576(7787):459-464.
21. Chen D, Li L, Diaz K, Iyamu ID, Yadav R, **Noinaj N**, Huang R. Novel Propargyl-Linked Bisubstrate Analogues as Tight-Binding Inhibitors for Nicotinamide N-Methyltransferase. *J Med Chem* (2019) 62(23):10783-10797.

20. Wu R, Stephenson R, Gichaba A, **Noinaj N**<sup>1</sup>. The big BAM theory: An open and closed case? *Biochim Biophys Acta Biomembr.* (2019) (*in press*).
19. Chen D, Dong G, **Noinaj N**, Huang R. Discovery of Bisubstrate Inhibitors for Protein N-Terminal Methyltransferase 1. *J Med Chem.* (2019) 62(7):3773-3779.
18. Ha L, Colquhoun J, **Noinaj N**, Das C, Dunman P, and Flaherty D. Crystal structure of the ribonuclease P protein subunit from *Staphylococcus aureus*. *Acta Cryst F* (2018) 74(Pt 10):632-637.
17. **Noinaj N** and Buchanan SK (Eds.) *Current Opinion in Structural Biology - Membranes* (2018) 51:vii-viii.
16. Lundquist K, Bakelar J, **Noinaj N**, Gumbart JC. C-terminal kink formation is required for lateral gating in BamA. *PNAS* (2018) 115(34):E7942-E7949.
15. Sikora AE<sup>\*1</sup>, Wierzbicki IH, Zielke RA, Ryner RF, Korotkov KV, Buchanan SK, and **Noinaj N**<sup>\*1</sup>. Structural and functional insights into the role of BamD and BamE within the  $\beta$ -barrel assembly machinery in *Neisseria gonorrhoeae*. *JBC* (2018) 293(4):1106-1119.
14. O'Neil P, Richardson L, Yamuna P, **Noinaj N**<sup>\*1</sup>, and Schnell D<sup>\*1</sup>. Molecular insight into the role of the POTRA domains of Toc75 in chloroplasts. *PNAS* (2017) 114(24):E4868-E4876.
13. Botos I, **Noinaj N**, Buchanan SK. Insertion of proteins and lipopolysaccharide into the bacterial outer membrane. *Proceedings of the Royal Society B* (2017) 372(1726).
12. **Noinaj N**<sup>\*1</sup>, Gumbart JC, Buchanan SK<sup>\*1</sup>. The  $\beta$ -barrel assembly machinery in motion. *Nature Reviews Microbiology* (2017), 4:197-204. (\*\*Highlighted on journal cover)
11. Bakelar J, Buchanan SK<sup>\*1</sup>, **Noinaj N**<sup>\*1</sup>. Structural snapshot of the BAM complex. *FEBS J.* (2016) doi: 10.1111/febs.13960.
10. Abeykoon A<sup>\*</sup>, **Noinaj N**<sup>\*1</sup>, Wise K, Chao CC, Wang G, Gucek M, Ching WM, Chock PB, Buchanan SK, and Yang DC<sup>\*</sup>. Structural insight into substrate recognition and catalysis in OmpB methyltransferases from *Rickettsia*. *JBC.* (2016) 291 (38):19962-74.
9. Celia H<sup>\*</sup>, **Noinaj N**<sup>\*1</sup>, Zakharov SD, Bordignon E, Botos I, Cramer WA, Lloubes R<sup>1</sup>, and Buchanan SK<sup>1</sup>. Structural insight into the role of the Ton complex in energy transduction. *Nature.* (2016) 538 (7623):60-65.
8. Tinoco AD, Saxena M, Sharma S, **Noinaj N**, Delgado Y, Quiñones González EP, Conklin SE, Zambrana N, Loza-Rosas SA, Parks TB. Unusual synergism of transferrin and citrate in the regulation of Ti(IV) speciation, transport, and toxicity. *JACS.* (2016) 138(17):5659-65.
7. Bakelar J, Buchanan SK, and **Noinaj N**<sup>1</sup>. The structure of the  $\beta$ -barrel assembly machinery complex. *Science* (2016) 351(6269):180-6.
6. **Noinaj N**<sup>\*1</sup>, Mayclin S, Stanley AM, Jao CC, and Buchanan SK<sup>1</sup>. From constructs to crystals – Towards structure determination of  $\beta$ -barrel outer membrane proteins. *J. Vis. Exp.* (2016) (113), e53245, doi:10.3791/53245.
5. Cash DR, **Noinaj N**, Buchanan SK, and Cornelissen CN. Beyond the crystal structure: Insight into the function and vaccine potential of TbpA expressed by *Neisseria gonorrhoeae*. *Infect Immun.* (2015) 83(11):4438-49.
4. Rollauer SE, Soorshjani MA, **Noinaj N**<sup>\*1</sup>, Buchanan SK<sup>\*1</sup>. Outer membrane protein biogenesis in Gram-negative bacteria. *Philos Trans R Soc Lond B Biol Sci.* (2015) 370(1679).
3. **Noinaj N**<sup>1</sup>, Rollauer SE, and Buchanan SK<sup>1</sup>. The  $\beta$ -barrel membrane protein insertase machinery from Gram-negative bacteria. *Curr Op Struct Bio* (2015), 31:35-42.
2. O'Neil PK, Rollauer SE, **Noinaj N**<sup>1</sup>, Buchanan SK<sup>1</sup>. Fitting the pieces of the  $\beta$ -barrel assembly machinery complex. *Biochemistry* (2015) 54(41):6303-11.
1. Shen HH, Leyton DL, Shiota T, Belousoff MJ, **Noinaj N**, Lu J, Holt SA, Tan K, Selkrig J, Webb CT, Buchanan SK<sup>M</sup>, Martin LL, Lithgow T. Reconstitution of a nanomachine driving the assembly of proteins into bacterial outer membranes. *Nat Commun.* (2014) 24;5:5078.

### Selected Patents

1. 8,632,989 (Mutant insulin degrading enzyme and methods of use), January 21, 2014

## Research Support

### Active Support

NIGMS 1R01GM127896-01 (Noinaj) 05/01/18 - 03/31/23

*Structural Characterization of the TOC Protein Translocon Machinery*

The goal of this proposal is to structurally and functionally characterize the TOC complex, the gateway complex for import into the chloroplast. Role: PI

NIAID 1R01AI127793-01 (Cornelissen) 07/01/17 - 09/30/21

*Neisseria gonorrhoeae metal transporters that subvert nutritional immunity*

The goal of this proposal is to determine how *Neisseria* use surface proteins to evade host immunity. Role: Sub-contractor (Structural studies of TdfH)

NIGMS 1R01GM127884 (Noinaj) 07/08/19 - 05/31/23

*Unraveling the mechanism by which the BAM complex mediates OMP biogenesis*

The goal of this proposal is to determine substrate interactions of the BAM complex which is responsible for folding OMPs into the outer membrane of Gram-negative bacteria. Role: PI

Purdue U. (Noinaj) 05/01/19 - 12/31/19

*State-of-the-Art Crystallization at Purdue with Rock Imager 1000 Duo*

Internal Purdue Univ. equipment grant for the purchase of a state-of-the-art crystallization imaging and plate hotel system, can automatically record high-resolution images of all these experiments on a user-designed schedule, both documenting and analyzing each condition for crystal growth. Role: PI

NIGMS SC1 (Sun) 05/01/19 - 12/31/21

*Membrane interaction of Mycobacterium tuberculosis virulence*

The goal of this project is to characterize the structure and function of ESAT6 which is essential for pathogenesis. Role: Sub-contractor (Structural studies of ESAT6)

### Completed Support

Sponsored Support - Achaogen (Noinaj) 11/31/17 - 12/01/18

*Expression and purification of the BAM complex from Acinetobacter baumannii*

The goal of this proposal is to express and purified active BAM complex from *A. baumannii* for downstream therapeutics development and for structural studies. Role: PI

Purdue U. (Noinaj) 01/01/18 - 12/31/18

*Acquisition of Automated Robotics for Innovative Crystallization Screen Preparation*

Internal Purdue Univ. equipment grant for the purchase of a department shared 96-channel automated pipetting instrument and automated microplate heat sealer for crystallization screen preparation for the crystallization core facility. Role: PI

NIAID/NIH K22 AI113078-02 (Noinaj) 07/15/15 - 06/30/18

The role of BamA in the biogenesis of beta-barrel membrane proteins

The goal of this project is to determine the structural features of BamA which directly play a role within the BAM complex for the folding and insertion of OMPs in Gram-negative bacteria. Role: PI

Indiana CTSI Pilot Funding (Noinaj) 05/01/15 - 06/30/18

Investigating substrate recognition by the  $\beta$ -barrel assembly machinery complex

The goal of this proposal is to gather preliminary data on substrate recognition by the BAM complex using the cryoEM facilities at Purdue University. Role: PI

Purdue U. EVPRP (Noinaj) 06/01/18 - 5/31/19

*The role of LbpB in mediating Neisserial pathogenesis*

Internal Purdue Univ. award that is intended to assist in gathering preliminary data for future NIH funding. Role: PI

Showalter Trust Award (Noinaj) 07/01/16 - 09/30/17

*Targeting the BAM Complex for Antibiotic Development against Neisseria Gonorrhoeae*

The goal of this proposal is to develop an assay for drug discovery targeting the NgBAM complex. Role: PI

Sponsored Support - Achaogen (Noinaj) 08/01/16 - 07/31/17

*Expression and purification of the BAM complex from Acinetobacter baumannii*

The goal of this proposal is to express and purified active BAM complex from *A. baumannii* for downstream therapeutics development and for structural studies. Role: PI

Purdue Univ. Award (Barker)

05/01/15 - 12/31/16

*Structural dynamics of psychostimulants at dopamine transporters*

To study the dynamics of dopamine transporters upon ligand recognition and signal transduction.

Role: co-PI

Purdue U. (Noinaj)

05/01/15 - 12/31/16

*Bringing Crystallography Back into Focus with a Suite of State-of-the-Art Microscopes*

Internal Purdue Univ. equipment grant for the purchase of department shared microscopes for the crystallization core facility. Role: PI

## Scientific Leadership

- Invited lecturer for the Cold Spring Harbor Lab course in X-ray Methods in Structural Biology (2019)
- Co-organizer/director of the Frontiers in Biophysics Seminar Series at Purdue University (2019-pres)
- Co-Editor, Volume entitled ‘Membranes’, Current Opinion in Structural Biology (2018)
- SURF Faculty Host/PI for summer undergraduate student (2018)
- Faculty advisor to the Structural Biology Club (2018 – pres)
- Have written several internal and external equipment grants to make the Crystallization Core in Hockmeyer Hall more usable for non-crystallographers with the goal of making structure determination more accessible to everyone on Purdue’s campus (2014, 2015, 2016, 2017 and 2018)
- Poster/oral presentation judge for the Hitchhiker’s Guide to the Biomolecular Galaxy symp. (2017, 2018)
- Poster judge for the Purdue Office of Interdisciplinary Graduate Programs Spring Symposium (2018)
- Faculty Advisor for Biology Graduate Student Association, Dept. of Biological Sciences (2018 – pres)
- Faculty mentor to ~10 biology major undergraduate students each semester in the Department of Biological Sciences Faculty Mentoring Program (2015 - pres)
- 20+ undergraduates are currently or have performed research in my lab (2015 – pres)
- Secured \$49,000 for lab instrumentation for my BIOL 195 course (2017)
- Reviewed grants for iCTSI Pilot Funding opportunities (2016 and 2017)
- Guest speaker at the Purdue Student Science Council showcase for undergraduate research (2017)
- Two undergraduates worked in my lab on independent research projects (Summer, 2016)
- Guest speaker at the Purdue Student Science Council showcase for undergraduate research (2016)
- Faculty advisor for the annual Hitchhiker’s Guide to the Biomolecular Galaxy symposium for undergraduates, graduates, and postdoctoral fellows (2016)
- Reviewed abstracts for the American Society for Microbiology Meeting (2016)
- Member of the PULSe program with membership to the two training groups: Biomolecular Structure and Biophysics and Membrane Biology (2015 – pres)
- Member of the Department of Biological Sciences Research Areas Structural and Computational Biology & Biophysics; and Microbiology, Immunology and Infectious Disease (2014 – pres)
- Member of the Purdue Institute of Inflammation, Immunology and Infectious Disease (2016 – pres)
- Faculty presenter for undergraduate recruitment, Dept of Biological Sciences (2016 – pres)
- Biology Undergraduate Honors Committee, Dept of Biological Sciences (2017 – pres)
- Founder and Faculty Advisor of the Structural Biology Journal Club within the Structural and Computational Biology & Biophysics research area (2016 – pres)
- Admissions Committee, Dept of Biological Sciences (2015 – pres)
- Co-organizer of the Tessman memorial symposium, Dept of Biological Sciences (2017)
- Faculty Search Committee to hire new faculty focusing on EM methods (2016 and 2017)
- Special Structural Biology Revitalization Committee (2015/2016)

## Invited Talks and Lectures

### National and International Meetings

Lorne Research Conference (45<sup>th</sup>) on Protein Structure and Function, Lorne, Australia, 2020

Gordon Research Conf. - Protein Transport Across Membranes, TX, 2020  
Gordon Research Conf. - Protein Transport Across Membranes, TX, 2018  
American Crystallographic Association Meeting, New Orleans, LA, 2017  
FASEB, Molecular Biophysics of Membranes, Snowmass, CO, 2016  
Midwest Protein Folding Conference, Notre Dame, IN 2016 (Plenary lecture)  
Membrane Protein Structures at APS, Argonne National Lab, 2015  
International Union of Crystallography, Montreal, 2014  
American Crystallographic Association, Albuquerque NM, 2014  
Gordon Research Conference - Protein Transport Across Membranes, Galveston TX, 2014

#### Regional Meetings and Workshops

Hitchhiker's Guide to the Protein Galaxy, Purdue Univ., 2015

#### Universities and Other Institutions

University of Kentucky, Department of Molecular and Cellular Biochemistry, 2019  
Dartmouth College, Department of Chemistry, 2019  
Georgia Institute of Technology, School of Physics, 2018  
Univ. of Tennessee, Biochemistry and Cellular and Molecular Biology, 2017  
Indiana University School of Medicine, Biochemistry and Molecular Biology, 2017  
Univ. of Missouri, Biochemistry, 2017  
Univ. of Texas El Paso, El Paso, TX, 2016  
Cornell University, Ithaca NY, 2015  
Purdue University, Dept of Chemistry, 2015  
Purdue University, Dept of Biochemistry/Ag, 2015  
Achaogen, San Francisco CA, 2015