

# GREGOR NEUERT, Ph.D.

Associate Professor of Molecular Physiology and Biophysics, Vanderbilt University

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## CONTACT INFORMATION

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**Website** <https://lab.vanderbilt.edu/neuert-lab/>

## EDUCATION

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1996 - 2001 **M. Eng.**, Technical Physics, Department of Physics, Ilmenau University of Technology, Germany

2002 - 2005 **Ph.D.**, Physics, Department of Physics & Center for NanoScience (CeNS), Ludwig Maximilians University, Munich, Germany  
Advisor: Professor Hermann E. Gaub  
Thesis: "Single Molecule Force Spectroscopy of Molecular Machines and Receptor-Ligands"

## TRAINING

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2006 - 2012 **Postdoctoral Fellow**  
Massachusetts Institute of Technology, Cambridge, MA, USA  
Departments of Physics, Biology & the Koch Institute for Integrative Cancer Research  
Advisor: Professor Alexander van Oudenaarden  
Supported by the German Science Foundation (DFG) Postdoctoral Fellowship (2006-2008)

## **ACADEMIC APPOINTMENTS**

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- 2002 - 2005 Graduate Research Assistant  
Ludwig Maximilians University, Munich, Germany  
Advisor: Professor Hermann E. Gaub
- 2012 - present **Associate Professor (Tenured)** and Assistant Professor (tenure -track)  
Vanderbilt University, Nashville, TN  
Department of Molecular Physiology and Biophysics, School of Medicine
- 2013 - present Department of Biomedical Engineering, School of Engineering
- 2015 - present Department of Pharmacology, School of Medicine

## **AWARDS AND HONORS**

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- 1998 & 1999 Fellow, Ion Beam Laboratory, Bozeman, MT, USA
- 1999 Undergraduate Research Fellowship, Pacific Northwest National Laboratory, Richland, WA, USA
- 1997 & 2001 Fellow, Nobel Laureate Meeting, Lindau, Germany
- 2005 Mirana Conference Travel Award, Dead Sea, Israel
- 2006 Best Publication Award, Center for NanoScience (CeNS), Munich, Germany
- 2006 - 2008 Postdoctoral Fellowship, German Science Foundation (DFG)
- 2014 - 2019 NIH Director's New Innovator Award, Top 25 of applicants (5%tile)
- 2021 - 2025 Dean's Faculty Fellow, Endowed Chair, Vanderbilt School of Medicine Basic Sciences

## **PROFESSIONAL MEMBERSHIPS**

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- 2008 - present American Biophysical Society (BPS)
- 2015 - present International Society for Computational Biology (ISCB)
- 2017 - present American Society for Cell Biology (ASCB)
- 2023 - present Biomedical Engineering Society (BMES)
- 2024 - present American Association of Cancer Research (AACR)

## **PROFESSIONAL ACTIVITIES – INTRAMURAL**

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### **Departmental**

- 2013 - present Graduate Education Committee (GEC), Department of Molecular Physiology and Biophysics

- 2015 - 2019 Co-organizer, Seminar series, Department of Molecular Physiology and Biophysics
- 2019 - 2020 Faculty Search Committee, Department of Molecular Physiology and Biophysics
- 2023 Co-organizer, Annual Retreat, Department of Department of Molecular Physiology and Biophysics

**School**

- 2013 - present Participate in recruiting events and interview student candidates for the Integrated Graduate Program (IGP), School of Medicine
- 2013 - present Participate in recruiting events and interview student candidates for the Quantitative and Chemical Biology (QCB) Graduate Program, School of Medicine
- 2013 - present Participate in recruiting events and interview student candidates for the M.D./Ph.D. graduate program, School of Medicine
- 2013 - present Participate in recruiting events and interview student candidates for the Biomedical Engineering (BME) Graduate Program, School of Engineering
- 2019 - 2020 Faculty Search Committee Computational Biology, School of Medicine Basic Science
- 2019 - 2020 Strategic Opportunities Committee, School of Medicine Basic Science
- 2021 - 2021 Quantitative Biology group, IGP curriculum revision
- 2023 - present Education Committee, NIH Molecular Biophysics Training Program
- 2023 - 2024 Faculty Search Committee, Center for Applied AI in Protein Dynamics

**University**

- 2015 - 2016 Faculty Search Committee in Systems Biology, Department of Biological Sciences, School of Arts & Sciences
- 2017 Task Force on Trans-Institutional Masters in Data Science
- 2017 Undergraduate Immersion, Presentation on computational approaches to biology
- 2018 - present Executive Committee, Data Science Institute
- 2019 Vanderbilt University delegation to visit MIT and learn about MIT's new school

of Artificial Intelligence and Machine Learning

2020 - present Data Science Next Generation Committee

2021 - 2022 Faculty Search Committee, Department of Biomedical Engineering,  
School of Engineering

2023 - present Research Integrity and Compliance Committee (RICC)

2023 Co-organizer, Symposium, AI Revolutions Symposium, Vanderbilt Data  
Science Institute

2024 - present Graduate Faculty Council

### **Affiliations**

2013 - present Cellular, Biochemical and Molecular Sciences Graduate Training  
Program

2013 - present Molecular Biophysics Training Program

2013 - present Chemical and Physical Biology Graduate Program

2013 - present Vanderbilt Center for Quantitative Sciences

2013 - present Training in Pharmacological Sciences Training Program

2014 - present Integrated Biological Systems Training in Oncology Training Program

2014 - present Multidisciplinary Training in Molecular Endocrinology Training  
Program

2014 - present Medical Scientist Training Program

2014 - present Vanderbilt Center for Chemical Biology

2015 - present Vanderbilt Ingram Cancer Center

2015 - present Vanderbilt Quantitative Systems Biology Center

2015 - present Vanderbilt Center for Stem Cell Biology

2016 - 2021 Vanderbilt Training Program in Big Biomedical Data Science

2017 - present Training Program in Ion Channel and Transporter Biology

2017 - present Training Program in Stem Cell and Regenerative Developmental Biology

2018 - present Vanderbilt Institute for Infection, Immunology, and Inflammation (VI4)

2018 - present Vanderbilt Data Science Institute Training Program

2019 - present Training Program in Integrated Training in Engineering and Diabetes

2020 - present Human Genetics Training Program

2021 - present Immunological Mechanisms of Disease Training Program

2021 - present Training Program in Environmental Toxicology

## **PROFESSIONAL ACTIVITIES – EXTRAMURAL**

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### **Seminar Series**

2021-present    Seminar Series Co-organizer, Insights in Signaling Dynamics and Encoding (InSiDE), Virtual International Seminar Series (<https://signalingdynamics.org/>)

### **Professional Meetings**

2017    Chair, Symposium on Biophysics of lncRNA, American Biophysical Society Meeting, New Orleans, USA

2017    Biophysics of lncRNA Symposium interview with Gregor Neuert ([https://youtu.be/\\_gGwmvJTItE](https://youtu.be/_gGwmvJTItE))

2017    Biophysical Society, Abstract review for Annual Meeting 2018

2022    Session Chair, Q-bio conference, Colorado State University, Fort Collins, CO, USA

2022    Session Chair, System Biology of Human Disease, Nashville, TN, USA

2024    Session Chair, FASEB conference, Dynamics and Encoding in Cell Signaling, Niagara Falls, NY, USA

### **Journal Editor**

2016-present    Guest Editor, PLOS Computational Biology

### **Journal Ad Hoc Reviewer for**

- Advanced Science
- Biomacromolecules and Biointerfaces
- ChemPhysChem
- eLife
- FEBS letters
- EMBO
- EMBO Molecular Systems Biology
- Genetics
- Journal of Biological Chemistry
- Journal of Clinical Investigation

- Journal of Molecular Biology
- Journal of the Royal Society Interface
- Molecular Biology of the Cell
- Nature
- Nature Genetics
- Nature Methods
- Nature Structural and Molecular Biology
- Nucleic Acid Research
- Physical Biology
- PLOS Computational Biology
- PNAS
- Science
- Scientific Reports
- Trends in Genetics

### **Funding Agency Review**

2011 Netherlands Organization for Scientific Research

2014 Minerva Foundation, Israel

2019 Biotechnology and Biological Sciences Research Council, UK

2022 NIH, MABS Study section, May and October

2023 NIH, BBBT Study section, March

2024 NIH, BBBT Study section, March

### **Career development**

2018 Culturally Aware Mentor Training Workshop, Two full days

2019 Reporting and responding to sexual misconduct

2019 Writing Mentoring and Diversity Statement for T32s workshops

2023 CIMER workshop on Articulating your Mentoring Philosophy

2023 CIMER workshop on Promoting Professional Development

## TEACHING ACTIVITIES

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### Courses:

#### Prior to Vanderbilt

##### *Undergraduate*

2003 - 2005      Advanced Undergraduate Physics Laboratory, Graduate Student Instructor,  
Ludwig Maximilians University, Munich, Germany

##### *Graduate*

2003 Spring      Introduction into Biophysics, Teaching Assistant, Ludwig Maximilians  
University, Munich, Germany

2003/04 Fall      Cellular Biophysics, Teaching Assistant, Ludwig Maximilians University,  
Munich, Germany

2004/05 Spring    Molecular Biophysics, Teaching Assistant, Ludwig Maximilians University,  
Munich, Germany

#### Courses at Vanderbilt:

2013 Feb.          Graduate Seminar in Molecular Biophysics, Molecular Biophysics Training  
Program (1 lecture hour)

2013 Apr.          RNA - minimester (2 lecture hours)

2013 Apr.          Cellular, Biochemical and Molecular Sciences Graduate Training  
Program (1 lecture hour)

2013 Dec.          RCR lecture, Molecular Biophysics Training Program (1 lecture hour)

2014 Feb.          Graduate Seminar in Molecular Biophysics, Molecular Biophysics Training  
Program (1 lecture hour)

2014 Mar.-Apr.    Co-developed the minimester on Quantitative Systems Biology (5 lecture  
hours)

2014 Oct.          CPB 306 - Introduction to Chemical and Physical Biology (5 lecture hours)

2014 Nov.          BMIF 310 - Foundations of Bioinformatics (2 lecture hours)

2015 Mar.-Apr.    Quantitative Systems Biology Minimester - Leader (5 lecture hours)

2015 April          MPB/CDB332 - Regulation of Gene Transcription (6 lecture hours)

2015 October      CPB 306 - Introduction to Chemical and Physical Biology (5 lecture hours)

2016 Mar.-Apr.    MPB/CDB332 - Regulation of Gene Transcription (5 lecture hours)

2016 Mar.-Apr.	Quantitative Systems Biology Minimester - Leader (9 lecture hours)
2016 July	Graduate Seminar in Molecular Biophysics, Molecular Biophysics Training Program (1 lecture hour)
2016 July	RCR lecture, Molecular Biophysics Training Program (1 lecture hour)
2016 Nov.	CPB 306 - Introduction to Chemical and Physical Biology (4 lecture hours)
2017 Feb.-Mar.	Quantitative Systems Biology Minimester - Leader (8 lecture hours)
2017 Nov.	CPB 8306 - Introduction to Chemical and Physical Biology (4 lecture hours)
2018 Apr	Graduate Seminar in Molecular Biophysics, Molecular Biophysics Training Program (1 lecture hour)
2018 Nov.	CPB 8306 - Introduction to Chemical and Physical Biology (5 lecture hours)
2019 Sep.	RCR lecture, Molecular Biophysics Training Program (1 lecture hour)
2019 Oct.	CPB 8306 - Introduction to Chemical and Physical Biology (5 lecture hours)
2020 Feb.	Signal Transduction in Disease -minimester course (1 lecture hour)
2020 Nov.	CPB 8306 - Introduction to Chemical and Physical Biology (4 lecture hours)
2021 Feb.	Signal Transduction in Disease - minimester course (1 lecture hour)
2021 Aug./Sep.	IGP 8001-02 Bioregulation I (8 lecture hours)
2021 Nov.	CPB 8306 - Introduction to Chemical and Physical Biology (4 lecture hours)
2022	IGP Quantitative Biology (3 lecture hours)
2022-2023	IGP Peer Learning Cohort (PLC) facilitator (1 lecture per week, 32 weeks per academic year, 32 lecture hours)
2022 Nov.	CPB 8306 - Introduction to Chemical and Physical Biology (3 lecture hours)
2023 Oct.	CPB 8306 - Introduction to Chemical and Physical Biology (3 lecture hours)
2024 Oct.	CPB 8306 - Introduction to Chemical and Physical Biology (3 lecture hours)

#### **Invited Teaching Lectures elsewhere:**

2011	Satellite workshops at the fifth annual q-bio conference, Santa Fe, NM, USA
2011	Q-bio summer school, Los Alamos, NM, USA
2012	Satellite workshops at the sixth annual q-bio conference, Santa Fe, NM, USA
2014	Satellite workshops at the eighth annual q-bio conference, Santa Fe, NM, USA
2021	Virtual Q-bio summer school, Colorado State University, Fort Collins, CO, USA



## Research Supervision:

### Prior to Vanderbilt

- 2003 - 2006 Ludwig Maximilians University, Munich, Germany
- 2006 - 2012 Massachusetts Institute of Technology, Cambridge, MA  
Supervision and mentoring of 15+ undergraduate students, graduate student and postdocs majoring in physics, biology and engineering
- 2007 Mentor, HHMI-sponsored MIT Summer Research Program for minority undergraduates, Massachusetts Institute of Technology, Cambridge, MA

### At Vanderbilt:

#### Undergraduate Students:

- 2016 - 2017 **Arunabh Singh**, Undergraduate student, Electrical Engineering Computer Science
- 2016 - 2017 **Group of four BME undergraduate students**, Senior Design Project
- 2106 - 2017 **Chloe Mehring**, Undergraduate student, Computer Science
- 2017 - 2018 **Jenna Oratz**, Undergraduate student, Biomedical Engineering
- 2017 - 2018 **Zohaib Lakhani**, Undergraduate student, Biomedical Engineering
- 2018 **Evan Wang**, Undergraduate student, Computer Science
- 2022 - 2023 **Haoju 'Horace' Leng**, Undergraduate student, Computer Science
- 2022 - 2023 **Savindu Buluwana**, Undergraduate Student, Molecular and Cellular Biology
- 2022 - 2023 **Alexander Lin**, Undergraduate Student, Computer Science & Biology

#### Graduate Students:

- 2015 - 2020 **Alexander Thiemicke**, Ph.D. Candidate in in Chemical and Physical Biology
- American Heart Association Predoctoral Fellow (2018 – 2020)
  - Vanderbilt Institute for Clinical and Translational Research Grant (2019)
  - Russell G. Hamilton Graduate Leadership Development Institute Travel Grant (2019)
  - NSF 'Finding your inner modeler" Workshop Travel Grant (2019)

- NSF-Simons Center for Multiscale Cell Fate Research Annual Symposium Travel Award (2019)

2015 - 2023 **Benjamin Kesler**, Ph.D. Candidate in Molecular Physiology and Biophysics

- Harold Stirling Vanderbilt award (2014)
- supported by the Molecular Biophysics NIH Training Grant (2015-2017)
- Q-bio summer school Fellowship (2016)
- NSF ‘Finding your inner modeler” Workshop Travel Grant (2019)
- Charles R. Park Student Travel Award (2019)
- 1st place at Segmentation Competition at Vanderbilt’s Cell Imaging Hackathon (2020)

2015 - 2016 **Robin Hohe**, Master Student, Physics, University of Ulm, Germany

- NSF ‘Finding your inner modeler” Workshop Travel Grant (2019)

2019 - present **Jason Hughes**, Ph.D. Candidate in Molecular Physiology and Biophysics

- Provost’s Graduate Fellow August (2018 —Present)
- Russel G. Hamilton Scholar August (2018 —Present)
- supported by the Integrated Training in Engineering and Diabetes NIH Training Grant (2019-2021)
- NSF ‘Finding your inner modeler” Workshop Travel Grant (2019)
- Q-bio Summer School Fellowship (2019)
- NSF Graduate Research Fellowship Program (2020-2024)
- 1st Place in BioTN Scipreneur Challenge (2021)

2020 - present **Blythe Hospelhorn**, Ph.D. Candidate in Human Genetics

- supported by the Big Biomedical Data Science NIH Training Grant (2020-2021)
- supported by the supported by the Integrated Training in Engineering and Diabetes NIH Training Grant (2021-2023)

## Postdoctoral Fellows:

- 2012 - 2017      **Dr. Guoliang Li** (Ph.D. in Biological Sciences, Wayne State University, Detroit, MI, USA)
- 2017 - 2023      **Dr. Hossein Jashnsaz** (Ph.D. in Physics, Purdue University, West Lafayette, IN, USA)
- Poster awardee, Cell & Developmental Biology retreat, Vanderbilt University, Nashville, TN, USA (2017)
  - NSF ‘Finding your inner modeler’ Workshop Travel Grant (2019)
- 2017 - 2020      **Dr. Amanda Johnson** (Ph.D. in Molecular Physiology & Biophysics, Vanderbilt University, Nashville, TN, USA)
- supported by the Ion Channel and Transporter Biology NIH Training grant (2017-2019)
  - NSF ‘Finding your inner modeler’ Workshop Travel Grant (2019)
- 2023 - 2024      **Dr. Catherine Leasure** (Ph.D. in Microbiology and Immunology, Vanderbilt University, Nashville, TN, USA)
- ASPIRE Postdoctoral Fellow

## Research Staff

- 2014 - 2017      **Dustin Rogers**, Research Assistant I (B.A. in Biology, Vanderbilt University)
- 2022 - present      **John Adams**, Research Assistant I (B.A. in Biology, University of Tennessee)

## Qualifying Exam and Thesis Committees – external

- 2016 - 2017      **Robin Hohe**, Department of Physics, University of Ulm, Germany

## RESEARCH PROGRAM:

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### Current Research Support

1R01GM140240-01A1 (PI: Neuert)

07/01/2021 - 06/30/2025

### NIH / NIGMS

Reviewed 3%tile

*Single cell analysis of dynamic gene regulation*

Goal: The primary goal is to develop a rigorous quantitative and dynamic single-cell framework to mechanistically dissect gene regulation by the evolutionary conserved SAGA histone acetyltransferase complex. Furthermore, our studies will provide a blueprint to dissect how other multiprotein complexes regulate gene expression.

2405765 (PI: Neuert)

02/15/2024 - 01/31/2025

### **NSF**

*I-Corps: Translation Potential of a Cell Culture Platform to Model Dynamic Drug Concentrations In Vitro*

Goal: This project aims to develop an automated cell culture platform to enhance the physiological relevance and predictive potential of preclinical drug testing

### **Other**

Dean's Faculty Fellow Endowed Chair Award

01/01/2021 - 12/31/2024

### **Completed Research Support**

DP2 GM114849-01 (PI: Neuert)

09/30/14-06/30/19

### **NIH / NIGMS**

Reviewed 5%tile

*Decoding the noncoding genome: lncRNA dynamics and function in single cells*

The goal was to understand the function of dynamic long non-coding RNA (lncRNA) expression in the context of divergent and convergent gene expression in yeast and mouse embryonic stem cells.

5R01GM115892 (PI: Neuert)

05/01/17-04/30/20

### **NIH / NIGMS**

*Molecular Mechanism of Gene Transcription Activation*

This project was transferred from Dr. Anthony Weil following his retirement to Dr. Neuert in 2017.

The goal of this project is to understand the molecular mechanisms controlling eukaryotic mRNA gene transcription by RNA Polymerase II with a focus on the function that the highly evolutionarily-conserved transcription factor complex TFIID played in mRNA gene transcription.

*Integrative Single Cell Atlas of Host and Microenvironment in Colorectal Neoplastic Transformation*

My contribution was to develop a multiplexed RNA FISH framework in combination with multiplexed protein immunofluorescence in the Lau and Coffey labs to build a single cell atlas in colorectal cancer.

*GCA: Combinatorial Single Cell Strategies for a Crohn's Disease Gut Cell Atlas*

The major goals are to determine the specific cell types in which genetic risk variants for Crohn's disease act and impact the function of different cells. The objective are (1) to identify which cells are affected (2) how cell programs are changing during Crohn's disease; (3) which cell-cell communications are disrupted within specific anatomical structures; (4) what is the effect of a specific therapeutic; and (5) what causes resistance to common therapies. The Neuert laboratory will establish RNA-FISH in human tissue from patients, design probes and guide collaborators in applying RNA-FISH.

## **PUBLICATIONS**

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### **Graduate Research**

(\*Contributed equally, #Corresponding author, §Co-senior authors)

1. Holland, N. B., T. Hugel, **G. Neuert**, D. Oesterhelt, L. Moroder, M. Seitz and H. E. Gaub, "Single-molecule force spectroscopy of azobenzene polymers: switching elasticity of single photochromic macromolecules", *Macromolecules*, 36 (6), 2015–2023, 2003.
2. Holland, N. B., T. Hugel, **G. Neuert**, M. Seitz and H. E. Gaub, "Photoisomerization studied by atomic force microscopy-based force spectrometry: optomechanical switching in polyazopeptide chain", *Microscopy and Microanalysis*, 10, 1420–1421, 2004.
3. **Neuert, G.**, S. Kufer, M. Benoit and H. E. Gaub, "Modular multichannel surface plasmon spectrometer", *Review of Scientific Instruments*, 76 (5), 054303, 1–4, 2005.

4. **#Neuert, G.**, C. Albrecht, E. Pamir and H. E. Gaub, "Dynamic force spectroscopy of the digoxigenin – antibody complex", *FEBS Letters*, 580 (2), 505–509, 2006.
5. **Neuert, G.**, T. Hugel, R. R. Netz and H. E. Gaub, "Elasticity of poly(azobenzene-peptides)", *Macromolecules*, 39 (2), 789–797, 2006.
6. **Neuert, G.**, C. Albrecht and H. E. Gaub, "Predicting the rupture probabilities of molecular bonds in series", *Biophysical Journal*, 93 (4), 1215–1223, 2007.
7. Albrecht, C., **G. Neuert** and H. E. Gaub, "Molecular force balance measurements reveal that double-stranded DNA unbinds under force in rate-dependent pathways", *Biophysical Journal*, 94 (12), 4766–4774, 2008.
8. Zimmermann, J. L., Th. Nicolaus, **G. Neuert** and K. Blank, "Thiol-based, site-specific and covalent immobilization of biomolecules for single-molecule experiments", *Nature Protocols*, 5 (6), 975-985, 2010.

### Postdoctoral Research

(\*Contributed equally, #Corresponding author, \$Co-senior authors)

9. Bumgarner, S. L., **\*G. Neuert**, B. F. Voight, A. Symbor-Nagrabska, P. Grisafi, A. van Oudenaarden and G. R. Fink, "Single-cell analyses reveal that noncoding RNAs contribute to phenotypic heterogeneity in clonal populations by modulating transcription factor recruitment", *Molecular Cell*, 45 (4), 470-482, 2012.  
**Highlight by:** Alex C. Tuck, David Tollervey, "An RNA Reset Button", *Molecular Cell*, 45 (4), 435-436, 2012.
10. **\*\*Munsky, B., \*\*G. Neuert**, and A. van Oudenaarden, "Using gene expression noise to understand gene regulation", *Science*, 336 (6078), 183-187, 2012.  
**Highlight by:** Valda Vinson, Beverly A. Purnell, Laura M. Zahn, John Travis, "Introduction to Special Issue: Does It Compute?", *Science*, 336, (6078), 171, 2012.
11. van Werven, F.J., **G. Neuert**, N. Hendrick, A. Lardenois, A. van Oudenaarden, M. Primig  
Gregor Neuert

and A. Amon, "Transcription of two long non-coding RNAs mediates mating type control of gametogenesis in budding yeast", *Cell*, 150 (6), 1170–1181, 2012.

12. \***Neuert, G.**, \*B. Munsky, R. Z. Tan, L. Teytelman, M. Khammash, A. van Oudenaarden, "Systematic Identification of Signal-Activated Stochastic Gene Regulation", *Science*, 339 (6119), 584-587, 2013.  
**Highlight by:** Annalisa M. VanHook, "Identifying the Goldilocks Model", *Science Signaling*, 6 (261), ec36-ec36, 2013.

### **At Vanderbilt as Assistant Professor**

Dr. Munsky is a former postdoctoral colleague, a long-term collaborator and now a PI at Colorado State University. (\*Contributed equally, #Corresponding author, \$Co-senior authors)

13. \*\*\$Munsky, B., \*\*\$**G. Neuert**, "From Analog to Digital Gene Regulation", *Physical Biology*, Jun 18;12(4):045004, 2015.
14. \*\*\$Munsky B., Z. Fox, \*\*\$**G. Neuert**, "Integrating Single-Molecule Experiments and Discrete Stochastic Models to Understand Heterogeneous Gene Transcription", *Methods*, Jun 12. pii: S1046-2023(15)00251-0, 2015.
15. Fox, Z., **G. Neuert**, B. Munsky, "Finite State Projection Based Bounds to Compare Chemical Master Equation Models Using Single-Cell Data", *The Journal of Chemical Physics*, 145, 2016
16. \*\*\$Munsky, B., G. Li, Z. Fox, D. Shepherd, \*\*\$**G. Neuert**, "Distribution Shapes Govern the Discovery of Predictive Models for Gene Regulation.", *Proceedings of the National Academy of Sciences*, July 17, 115 (29) 7533-7538, 2018.
17. Li, G., #**G. Neuert**, "Multiplex RNA single molecule FISH of inducible mRNAs in single yeast cells." *Scientific Data*, Jun 17; (6) 94, 2019.
18. Thiemicke, A., H. Jashnsaz, G. Li, #**G. Neuert**, "Generating kinetic environments to study dynamic cellular processes in single cells." *Scientific Reports*, Jul 12;9(1):10129., 2019.

19. Kesler, B., G. Li, A. Thiemicke, R. Venkat, #**G. Neuert**, “Automated cell boundary and 3D nuclear segmentation of cells in suspension.” *Scientific Reports*, Jul 15;9(1):10237, 2019.
20. Fox, Z.R., **G. Neuert**, and B. Munsky, “Optimal Design of Single-Cell Experiments to Estimate Models of Hog-MAPK Induced Transcription in *S. Cerevisiae*”, *Complexity*, Jun 13, 2020.
21. Jashnsaz, H., Z. Fox, J. Hughes, G. Li, B. Munsky, #**G. Neuert**, “Diverse cell stimulation kinetics identify predictive signal transduction models”, *iScience*, 23, 10, 23 Oct. 2020.
22. Johnson, A., Li, G., H. Jashnsaz, A. Thiemicke, B. Kesler, D. Rogers, #**G. Neuert**, “A rate threshold mechanism regulates yeast osmostress MAPK signaling and survival”, *Proceedings of the National Academy of Sciences*, Jan 12, 118 (2), e2004998118, 2021.
23. Thiemicke, A., #**G. Neuert**, “Kinetics of osmotic stress regulates a cell fate switch of cell survival”, *Science Advances*, Feb 19, 7 (8), eabe1122, 2021.
24. Jashnsaz, H., Z.R. Fox, B. Munsky, #**G. Neuert**, “A protocol to build predictive signaling models by perturbing cells with time-varying stimulations that result in distinct signaling responses”, *STAR protocols*, 2, 100660, September 17, 2021.

#### **At Vanderbilt as Associate Professor**

25. Thiemicke, A., #**G. Neuert**, “Rate thresholds in cell signaling have functional and phenotypic consequences in nonlinear time-dependent environments”, *Frontiers in Cell and Developmental Biology*, 11, March 21, 2023.
26. Leasure, C.S., #**G. Neuert**, “Modelling patient drug exposure profiles in vitro to narrow the valley of death”, *Nature Reviews Bioengineering*, 1-2, 2024.

#### **Book chapters**

1. **Neuert, G.** and H. E. Gaub, “Molecular machines: nano biotechnology towards silicon-carbon hybrids“, 261-275, in "Materie in Raum und Zeit", H. Fritzsche, J. Hacker, H. Hopf,



## Patents

1. **G. Neuert**, A. Thiemicke, A. Khouqeer, H. Jashnsaz, J. Hughes, "SYSTEMS AND METHODS FOR CONTROLLING AND ANALYZING TEMPORAL DYNAMICS IN SINGLE CELLS AND CELL POPULATIONS", PCT/US20231066991, filed 05/2023.

## **RESEARCH TALKS AND SEMINARS**

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### **Prior to Vanderbilt**

- 2000 Opening presentation of the institute of physics seminar, TU-Ilmenau, Ilmenau, Germany
- 2001 Condensed-matter physics seminar, Montana State University, Bozeman, MT, USA
- 2003 Sonder Forschungs Bereich 513 Workshop & Krupp-Symposium, Konstanz, Germany
- 2003 Scanning-probe microscopy and organic materials XII, Workshop, Mainz, Germany
- 2004 Sonder Forschungs Bereich 533 Workshop, Freising, Germany
- 2009 2. Workshop on stochasticity in biochemical reaction networks, Banff, AB, Canada
- 2009 Quantitative biology seminar series, center for nonlinear studies, Los Alamos National Laboratory, Los Alamos, NM, USA
- 2010 Gene Center Munich, Ludwig Maximilians University, Munich, Germany
- 2010 Center for Biological Signaling Studies, University of Freiburg, Freiburg, Germany
- 2010 Conference on systems biology of human disease, Harvard University, Boston, MA, USA
- 2011 Department of Physics, Vanderbilt University, Nashville, TN, USA
- 2011 Department of Mechanical Engineering, University of California, Santa Barbara CA, USA
- 2011 Department of Physics & Astronomy, Rutgers, The State University of New Jersey, Piscataway, NJ, USA
- 2011 Department of Physics, Northeastern University, Boston, MA, USA
- 2011 Fifth annual q-bio conference on cellular information processing, Santa Fe, NM, USA
- 2011 3. Workshop on stochasticity in biochemical reaction networks, Banff, AB, Canada
- 2011 Department of Bionanoscience, Delft University of Technology, Delft, Netherlands
- 2011 Institute for Molecules and Materials, Radboud University, Nijmegen, Netherlands
- 2012 Department of Physics, Emory University, Atlanta, GA, USA
- 2012 Department of Physics, University of Illinois, Urbana-Champaign, IL, USA
- 2012 Molecular Biology Section, Division of Biological Sciences, University of California, San

Diego, La Jolla, CA, USA

- 2012 Department of Chemistry and Biochemistry, Division of Physical Sciences, University of California, San Diego, La Jolla, CA, USA
- 2012 Department of Biochemistry and Biophysics, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA
- 2012 Department of Molecular Physiology and Biophysics, School of Medicine, Vanderbilt University, Nashville, TN, USA
- 2012 Department of Molecular Genetics and Cell Biology and Institute for Genomics and Systems Biology, University of Chicago, Chicago, IL, USA
- 2012 The Whitaker Biomedical Engineering Institute, School of Medicine, Johns Hopkins University, Baltimore, MD, USA
- 2012 Sixth annual q-bio conference on cellular information processing, Santa Fe, NM, USA

### **Post-Independence at Vanderbilt, Conference Talks**

- 2015 NIH Single Cell Analysis Program Investigators Meeting, NIH, Bethesda, MD, USA
- 2016 Winter Q-Bio Conference, Hawaii, USA
- 2016 EMBO Conference, Gene transcription in yeast, Sant Feliu de Guixols, Spain
- 2016 Q-Bio Conference, Nashville, TN, USA
- 2017 American Biophysical Society Meeting, New Orleans, LA, USA
- 2017 American Physical Society Meeting, New Orleans, LA, USA
- 2017 Q-Bio Conference, New Brunswick, NJ, USA
- 2018 EMBO Conference, Gene transcription in yeast, Sant Feliu de Guixols, Spain
- 2018 International Society for Computational Biology (ISCB), Chicago, IL, USA
- 2019 NIH, High Risk-High Reward Research Symposium, NIH, Bethesda, MD, USA
- 2019 NSF workshop: Finding Your Inner Modeler, University of Alabama, Birmingham, AL, USA
- 2019 FASEB conference on Protein Kinases and Protein Phosphorylation – Mechanisms to Therapeutics, Palm Springs, CA, USA – Selected contributing talk
- 2021 Cellular Dynamics & Models, Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, USA, (Virtual)
- 2021 NSF workshop: Finding Your Inner Modeler, University of Illinois, Chicago, IL, USA, (Virtual)
- 2022 Q-bio Conference, Colorado State University, Fort Collins, CO, USA
- 2022 Systems Biology of Human Diseases, Vanderbilt University, Nashville, TN, USA

2023 EMBO Workshop, X-chromosome inactivation: New insights on its 60th anniversary, Berlin, Germany

### **Post-Independence at Vanderbilt, Invited Extramural Seminars**

- 2014 Department of Molecular Biosciences, Northwestern University, Evanston, IL, USA, *invited by Prof. Dr. Jason Brickner*
- 2014 Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO, USA, *invited by Prof. Dr. Brian Munsky*
- 2014 National Institute of Allergy and Infectious Diseases (NIAID), NIH, Bethesda, MD, USA, *invited by Prof. Dr. John Tsang*
- 2015 Department of Pharmacology, University of North Carolina, Chapel Hill, NC, USA, *invited by Prof. Dr. J. Mauro Calabrese*
- 2015 Center for Systems Biology, Duke University, Durham, NC, USA, *invited by Prof. Dr. Nicolas Buchler*
- 2016 Physical Colloquium, Ulm University, Ulm, Germany, *invited by Prof. Dr. Kay-E. Gottschalk*
- 2016 Biological Colloquium, Technical University Darmstadt, Darmstadt, Germany, *invited by Prof. Dr. Alexander Loewer*
- 2016 Seminar, Department of Physics, Emory University, Atlanta, GA, USA, *invited by Prof. Dr. Ilya Nemenman*
- 2016 Colloquium, Department of Mathematics and Statistics, Georgia State University, Atlanta, GA, USA, *invited by Prof. Dr. Yi Jiang*
- 2016 Seminar, Department of Cell & Systems Biology, University of Toronto, Toronto, Canada, *invited by Prof. Dr. Alan M. Moses*
- 2016 van der Waals Colloquium, Department of Physics, Leiden University, Leiden, Netherlands, *invited by Prof. Dr. Stefan Semrau*
- 2016 Colloquium, AMOLF, Amsterdam, Netherlands, *invited by Prof. Dr. Jeroen van Zon*
- 2016 Seminar, Hubrecht Institute, Utrecht, Netherlands, *invited by Prof. Dr. Alexander van Oudenaarden*
- 2016 Seminar, Department of Bionanoscience, TU-Delft, Delft, Netherlands, *invited by Prof. Dr. Hyun Youk*
- 2019 Seminar, Department of Pharmacology and Experimental Therapeutics, LSU Health Sciences Center, New Orleans, LA, USA, *invited by Prof. Dr. Daniel R. Kapusta*

- 2020 Seminar, Insights in Signaling Dynamics and Encoding (InSiDE), College of Biological Sciences, UC Davis, Davis, CA, USA, (Virtual), *invited by Prof. Dr. John Albeck*
- 2021 Colloquium, Department of Physics, University of Minnesota, MN, USA, (Virtual), *invited by Prof. Dr. Elias Puchner*
- 2021 Seminar, NIH Systems Biology Interest Group, NIH, Bethesda, MD, USA, (Virtual), *invited by Dr. Grégoire Altan-Bonnet*
- 2021 Seminar, Insights in Signaling Dynamics and Encoding (InSiDE), College of Biological Sciences, UC Davis, Davis, CA, USA, (Virtual), *invited by Prof. Dr. John Albeck*
- 2022 Seminar, Insights in Signaling Dynamics and Encoding (InSiDE), College of Biological Sciences, UC Davis, Davis, CA, USA, (Virtual), *invited by Prof. Dr. John Albeck*
- 2023 Seminar, Biological Physics & Physical Biology, (Virtual), *invited by Prof. Dr. Prasad Ashok*
- 2023 Seminar, Ruhr University Bochum, Germany, *invited by Prof. Dr. Ingo Schmitz*
- 2024 Department of Chemical and Biological Engineering, Colorado State University, Fort Collins, CO, USA, *invited by Prof. Dr. Brian Munsky*
- 2024 Seminar, University of Michigan, Ann Arbor, MI, USA, *invited by Prof. Dr. Sundeep Kalantry*