

# Na Young Jun

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## Education

### Duke University

PH.D. IN NEUROBIOLOGY (EXPECTED MAY 2022)  
M.S. IN COMPUTER SCIENCE (EN-ROUTE)

Durham, NC  
Aug 2017 - present

### Yale University

M.S. IN BIOENGINEERING

New Haven, CT  
Aug 2014 - May 2015

- GPA 3.63/4.00, Received Mogam Science Foundation Scholarship

### Korea University

B.S. IN LIFE SCIENCES

Seoul, S. Korea  
Mar 2009 - July 2014

- GPA 3.60/4.00, Received Korea University Academic Scholarship

### University of Wisconsin-Madison

STUDENT EXCHANGE PROGRAM

Madison, WI  
Sep 2011 - May 2012

- GPA 3.77/4.00, Received Mirae Asset Exchange Student Scholarship

## Publications

### Inter-Mosaic Coordination of Retinal Receptive Fields

SUVA ROY, NA YOUNG JUN, JOHN PEARSON, GREG D. FIELD (*UNDER REVIEW*)

2020

### Phase transitions in the efficient coding of natural scenes

NA YOUNG JUN, GREG D. FIELD, JOHN PEARSON, (*IN PREPARATION*)

2020

### Patterns of neural correlations in V1 vary with the number of objects

NA YOUNG JUN, DOUGLAS A RUFF, SURYA T TOKDAR, MARLENE R COHEN, JENNIFER M GROH, IN *Biorxiv*, 777912

2019

### Channelrhodopsin Variants Engage Distinct Patterns of Network Activity

NA YOUNG JUN AND JESSICA A. CARDIN, IN *ENEURO* 2019; 10.1523/ENEURO.0222-18.2019

2018

### Connectomic Analysis Reveals an Interneuron with an Integral Role in the Retinal Circuit for Night Vision

SILVIA JH PARK, EVAN M LIEBERMAN, JIANG-BIN KE, NAO RHO, PADIDEH GHORBANI, POUYAN RAHMANI, NA YOUNG JUN, HAE-LIM LEE, IN-JUNG KIM, KEVIN L BRIGGMAN, JONATHAN B DEMB, JOSHUA H. SINGER, IN *ELIFE* 9, E56077

2020

### Convergence and Divergence of CRH Amacrine Cells in Mouse Retinal Circuitry

SILVIA JH PARK, JOSEPH POTTACKAL, JIANG-BIN KE, NA YOUNG JUN, POUYAN RAHMANI, IN-JUNG KIM, JOSHUA H SINGER, JONATHAN B DEMB, IN *JOURNAL OF NEUROSCIENCE* 38 (15), 3753-3766

2018

## Conferences

### The Influence of noise and information non-uniformity on the efficient coding of natural scenes

NA YOUNG JUN, GREG FIELD, JOHN PEARSON IN *COSYNE*

2020

### Fluctuating Activity (Time-Division Multiplexing) Varies Across Sensory Brain Regions

NA YOUNG JUN, JEFF MOHL, MARLENE COHEN, SURYA TOKDAR, JENNIFER GROH, IN *SOCIETY FOR NEUROSCIENCE*

2018

### Optogenetic Tools With Varying Kinetics Differentially Engage Intrinsic Network Resonance *In Vivo*

NA YOUNG JUN AND JESSICA A. CARDIN, IN *SOCIETY FOR NEUROSCIENCE*

2016

## Skills

### Programming

PyTorch, Python, MATLAB, Java, R

### Experiments

Electrophysiology (intracellular / extracellular neural recording), animal behavior, IHC

## Talks

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### **Optimal Spatial Arrangement of ON and OFF Encoders in the Noisy World: Under the Perspective of Information Efficiency**

NEUROBIOLOGY GRADUATE STUDENTS SEMINAR, DUKE UNIVERSITY

Durham, NC  
2020

### **Observe the Unobserved: Inferring Hidden Structure in Multilayer Neural Circuits**

NEUROBIOLOGY GRADUATE STUDENTS SEMINAR, DUKE UNIVERSITY

Durham, NC  
2018

### **Novel Optogenetic Tools for Probing Network Activity in the Intact Brain**

BIOMEDICAL ENGINEERING MASTER'S GRADUATION TALK, YALE UNIVERSITY

New Haven, CT  
2015

### ***In Vivo* Function of Next Generation Optogenetic Tools**

NEUROBIOLOGY GRADUATE STUDENTS SEMINAR, YALE UNIVERSITY

New Haven, CT  
2014

### **Comparative *In Vivo* Testing of the Efficacy of New Optogenetic Tools**

BIOMEDICAL ENGINEERING SPECIAL INVESTIGATION PRESENTATION, YALE UNIVERSITY

New Haven, CT  
2014

## Research Experience

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### **Field Lab (PI: Greg Field) & Pearson Lab (PI: John Pearson), Duke University**

DOCTORAL THESIS RESEARCH

Durham, NC  
Jul 2018 - Present

- Computational understanding of retinal information processing based on the efficient coding principle.

### **Groh Lab (PI: Jennifer Groh), Duke University**

FIRST YEAR PH.D. ROTATIONS

Durham, NC  
Apr 2018 - Jun 2018

- Analyzed patterns of neural correlations and time-division multiplexing in visual cortex (V1, V4) with respect to the number of objects in the visual field.

### **Grill Lab (PI: Warren Grill), Duke University**

FIRST YEAR PH.D. ROTATIONS

Durham, NC  
Jan 2018 - Apr 2018

- Single-unit recordings of Parkinsonian Rat brain during DBS stimulation to understand how DBS affects brain plasticity.

### **Kay Lab (PI: Jeremy Kay), Duke University**

FIRST YEAR PH.D. ROTATIONS

Durham, NC  
Sep 2017 - Jan 2018

- Live-imaging of microglial function in the retina.

### **Demb Lab (PI: Jonathan B. Demb), Yale University**

POSTGRADUATE RESEARCH ASSOCIATE

New Haven, CT  
Jul 2015 - Aug 2017

- Elucidated cellular mechanisms for visual processing by the retina.
- Characterized new cell types in the mouse retina, which can be defined based on their structure, function and gene expression.
- Pursued intersectional strategy between Cre and Flop recombinase driven by different promoters and expression of proteins and genetic expression pattern.

### **Cardin Lab (PI: Jessica A. Cardin), Yale University**

MASTER'S THESIS RESEARCH

New Haven, CT  
Aug 2014 - May 2015

- Studied spontaneous and activated optogenetic tool-induced gamma oscillations in the mouse visual cortex *in vivo*.
- Injected several novel optogenetic tools (Chrimson, Chronos, SwiChR) and Channelrhodopsin2 to the V1 cortex of mice brain and compared their *in vivo* activation.
- Conducted extracellular recording to compare spike rates and local field potential between mice with different optogenetic tools.

### **Advanced Computational Vision (Instructor: Steven Zucker), Yale University**

CLASS FINAL PROJECT

New Haven, CT  
Jan 2015 - May 2015

- Used machine learning methods to generate a neural signal classifier that distinguishes between the brain states: awake or anesthetized, moving or not moving, receiving visual stimuli or not.
- Developed a neural signal classifier to identify cortex layers where the neural signal originated.