

## **2017 Advanced Judicial Studies Institute: Neuroscience and the Law**

*Date:* Tuesday, June 27, 2017, 8:30 a.m. - 5:30 p.m.

*Presenters:* **Dr. Francis X. Shen, JD, PhD**

Associate Professor of Law & McKnight Presidential Fellow, University of Minnesota; Executive Director of Education & Outreach for the MacArthur Foundation Research Network on Law and Neuroscience; Senior Fellow, Harvard Center for Law, Brain and Behavior

**Dr. Octavio Choi, MD, PhD**

Assistant Professor, Division of Public Psychiatry, Oregon Health and Science University; Director, Forensic Evaluation Services, Oregon State Hospital

**Dean David L. Faigman, JD, MA**

Chancellor & Dean, University of California Hastings College of the Law; John F. Digardi Distinguished Professor of Law, UC Hastings College of the Law; Professor, Department of Psychiatry, University of California San Francisco

**Dr. Mark Mapstone, PhD**

Professor of Neurology, University of California Irvine; Member, UCI Institute for Memory Impairments and Neurological Disorders (UCI IMIND)

### *Summary of Course and Written Materials*

This course will introduce recent developments at the intersection of neuroscience and law. Neuroscience is increasingly introduced in courtrooms, and considered in policy debates. These developments create a pressing need for increased dialogue between neuroscience and law, and this session will enable that conversation. The session is divided into several parts.

8:30 – 8:45 am: Overview of the Program: What is “law and neuroscience”? (Dr. Shen)

8:45 – 9:30 am: An Introduction to Neuroscience for Judges, Part 1 of 2 (Dr. Choi)

9:30 – 9:40 am: *Break*

9:40 – 10:40 am: The Challenge of Group to Individual Inference (Dean Faigman)

10:40 – 10:50 am: *Break*

10:50 – 12:00 pm: Introduction to Neuroscience for Judges, Part 2 of 2 + Case Study on Criminal Responsibility (Drs. Choi and Shen)

12:00 – 1:10 pm: *Break + Lunch*

1:10 – 2:10 pm: Neuroscience in the Courtroom, with Case Studies (Drs. Choi and Shen)

2:10 – 2:20 pm: *Break*

2:20 – 3:20 pm: Neuroscience of Aging and Dementia (Dr. Mapstone)

3:20 – 3:30 pm: *Break*

3:30 – 4:30 pm: Neuroscience of Aging and Dementia (continued), plus Case Study on Dementia in the Courtroom (Drs. Mapstone and Shen)

4:30 – 4:40 pm: *Break*

4:40 – 5:30 pm: Round Table discussion (Drs. Mapstone and Shen)

An interactive responder system will be utilized to encourage audience participation, and discussion will be invited throughout the course.

The program is supported in part by the Research Network on Law and Neuroscience, supported by the John D. and Catherine T. MacArthur Foundation, and based at Vanderbilt Law School. Additional information on the Network, including extensive educational materials, is available online at: [www.lawneuro.org](http://www.lawneuro.org) .

The enclosed pages of written materials provide summary background and specific learning objectives for each part of the course. Creation of the materials was supported by the MacArthur Foundation Research Network on Law and Neuroscience.

In addition, for interested attendees, many full length videos of more extensive judicial education programs are available for free viewing at:

<https://www.youtube.com/user/LawNeuroOrg>

## **Introduction**

### *The Mission and History of the Research Network on Law and Neuroscience*

*The Research Network on Law and Neuroscience*, supported by the John D. and Catherine T. MacArthur Foundation, addresses a focused set of closely-related problems at the intersection of neuroscience and criminal justice. These include: 1) investigating law-relevant mental states of, and decision-making processes in, defendants, witnesses, jurors, and judges; 2) investigating in adolescents the relationships between brain development and cognitive capacities; and 3) assessing how best to draw inferences about individuals from group-based neuroscientific data.

The *Research Network* is an interdisciplinary collaborative initiative with two main goals: (1) to help the legal system avoid misuse of neuroscientific evidence in criminal law contexts, and (2) to explore ways to deploy neuroscientific insights to improve the fairness and effectiveness of the criminal justice system.

The MacArthur Foundation laid the cornerstones for the *Network* by drawing together several dozen of the nation's top researchers beginning in 2007 to conduct a coordinated and comprehensive investigation of basic issues at the intersection of law and neuroscience, funded by a four-year grant. In 2011, the new *MacArthur Foundation Research Network on Law and Neuroscience* began to build on those cornerstones with an interconnected program of research with three foci: Mental States, Development, and Evidence.

### *The Network's Education and Outreach Activities*

A central component of the *Network's* mission is Education and Outreach to the legal community. The centerpiece of these Education and Outreach activities is the *Network's* [Introduction to Law and Neuroscience](#) curriculum, which is presented through events for judges, lawyers, and others in the legal and criminal justice communities. To date, the *Network* and its members have introduced over 800 judges to law and neuroscience. The *Future of Law and Neuroscience* conference uses this curriculum, with specific adaptation and emphasis for the practicing bar.

In addition to these events, the *Network* engages in a variety of additional educational activities, including:

- Distribution of introductory neurolaw materials online at: [www.lawneuro.org](http://www.lawneuro.org) ;
- Maintenance of a publicly-accessible, sortable, and searchable *Law and Neuroscience Bibliography* (over 900 sources) at: <http://www.lawneuro.org/bibliography.php> ;
- Dissemination of *Network* research findings through Knowledge Briefs;
- Publication of the first [Law and Neuroscience](#) coursebook, forthcoming from Aspen Publishers
- Publication of [A Primer on Criminal Law and Neuroscience](#), forthcoming from Oxford University Press
- Co-sponsorship of [Neuroscience Boot Camp](#) at the University of Pennsylvania's Center for Neuroscience and Society

## *The Curriculum*

The MacArthur Foundation Research Network on Law and Neuroscience has designed a curriculum to introduce neuroscience in a legally relevant way for lawyers, judges, and other actors in the legal system. The curriculum emphasizes the real-world connections that judges and lawyers are already making between neuroscience and law. The primary objectives of the program are to:

- enable participants to ask the right questions when confronted with neuroscientific evidence;
- reflect on legal doctrine and practice in light of emerging neuroscience research on legally relevant questions;
- improve the legal system through dissemination of Network research that may aid legal fact-finding and adjudication; and
- strengthen neuroscience research by learning from participants how research can become more legally relevant and ecologically valid.

The comprehensive curriculum, only a subset of which can be reached in any given event, allows for coverage of the following topics:

1. Brain Basics: What do lawyers need to know about neuroscience and neuroimaging?
2. Brain and Behavior: What is the relationship between mind, brain, and behavior?
3. Limits and Cautions: What do brain scans really tell us?
4. Admissibility: How should the admissibility of neuroscientific evidence be assessed?
5. Culpability and Sentencing: How, if at all, should neuroscientific knowledge affect legal decisions regarding culpability and sentencing?
6. The Violent Brain: Why do some individuals become violent, and can we know who will be violent in the future?
7. The Adolescent Brain: How does the brain develop, how developed is the adolescent brain, and what are the legal implications that follow?
8. The Addicted Brain: Why do people become addicted, how does this affect decision-making, and what are the legal implications?
9. The Emotional Brain: How does emotion affect our decision-making?
10. The Injured Brain: How does brain injury affect behavior and mental functioning?
11. The Remembering Brain: How does human memory work and can neuroscience tools detect memories?
12. The Aging Brain: How can courts distinguish the normal aging process from dementia, and with what legal consequences?
13. The Lying Brain: Can brain science uncover lies?
14. The Future: What future developments in neuroscience will be most salient for law?

## Session Summaries

### Part 1: Overview: What is “law and neuroscience”?

**Presenter: Dr. Francis X. Shen**, Associate Professor of Law & McKnight Presidential Fellow, University of Minnesota; Executive Director of Education & Outreach for the MacArthur Foundation Research Network on Law and Neuroscience; Senior Fellow, Harvard Center for Law, Brain and Behavior

*Description and Learning Objectives:* Neuroscientific evidence is increasingly being proffered in U.S. courtrooms. This part of the session will provide a concise introduction to how neuroscience is presently being used for legal purposes, and how it may be used in the future. After this part of the session, participants will be able to:

- Appreciate the emerging field of neurolaw, and the many ways in which neuroscience might affect law.
- Understand the ways in which neuroscience is being proffered as evidence in criminal and civil contexts.
- Recognize basic concerns about the use of neuroscientific evidence in courtroom proceedings.
- Discuss the promises and limitations of future uses of neuroscience in law.

*The following hyperlinked background readings will facilitate this portion of the session:*

- OWEN D. JONES, JEFFREY D. SCHALL & FRANCIS X. SHEN, [LAW AND NEUROSCIENCE](#) (CHAPTER 1, INTRODUCTION) (2014).
- Henry T. Greely & Anthony D. Wagner, [Reference Guide on Neuroscience](#), in REFERENCE MANUAL ON SCIENTIFIC EVIDENCE (3 ED.) FEDERAL JUDICIAL CENTER; NATIONAL RESEARCH COUNCIL, 2011.
- Francis X. Shen, [Keeping up with Neurolaw: What to Know and Where to Look](#), 50 COURT REV. 104 (2014).

## Part 2: Brain Basics: An Introduction to Cognitive Neuroscience

**Presenter: Dr. Octavio Choi**, Director of Forensic Evaluation Services, Oregon State Hospital;  
Assistant Professor, Division of Public Psychiatry, Oregon Health and Science  
University

*Description and Learning Objectives:* Neuroscientific evidence is increasingly being encountered in the United States criminal justice system. This session will provide a concise and readily accessible introduction to human brain structure, brain function, and how structure and function are studied through modern neuroimaging techniques. Specific learning objectives include:

- Introduction to the general organization of the human nervous system, and the terms used in science and medicine to describe basic brain locations and structures.
- Explanation of how neurons communicate with one another, how this communication is related to human thought and behavior, and some of the methods employed in modern neuroscience research to study the activity of neurons in humans.
- Explanation of why an understanding of psychological processes and experimental designs is necessary to evaluate human brain function in imaging studies.
- Discussion of guiding principles and questions that should be asked in order to effectively assess neuroimaging data when proffered in legal settings.

*For additional background and reference, we recommend:*

- Online resources to introduce the brain available at: <http://lawneuro.org/resources.php>
- Teneille Brown & Emily Murphy, [\*Through A Scanner Darkly: Functional Neuroimaging as Evidence of a Criminal Defendant's Past Mental States\*](#), 62 STAN. L. REV. 1119 (2010).
- Owen D. Jones, Joshua W. Buckholtz, Jeffrey D. Schall & Rene Marois, [\*Brain Imaging for Legal Thinkers: A Guide for the Perplexed\*](#), 2009 STAN. TECH. L. REV. 5 (2009).

### Part 3: The Challenge of Group to Individual Inference

**Presenter: Dean David L. Faigman, Chancellor & Dean, University of California Hastings College of the Law; John F. Digardi Distinguished Professor of Law, UC Hastings College of the Law; Professor, Department of Psychiatry, University of California San Francisco**

#### Learning Objectives and Background Materials:

Following this part of the program, participants will be able to:

- Discuss the challenges of reasoning from group scientific data to individualized legal decision making, with reference to the research of the MacArthur Foundation Research Network on Law and Neuroscience to address this “G2i” challenge.
- Draw analogies and distinctions between neuroscientific evidence and other types of G2i evidence courts have previously encountered.
- Understand the debate, and consider possible ways to resolve, the challenge of distinguishing between the judge’s task of assessing the “admissibility” of expert testimony and the fact-finder’s responsibility to assess its “weight.”
- Develop strategies for managing the assessment of proffered neuroscientific evidence for individualized adjudication.

*The following background readings will facilitate this portion of the seminar:*

- David L. Faigman, Christopher Slobogin & John Monahan, [\*Gatekeeping Science: Using the Structure of Scientific Research to Distinguish Between Admissibility and Weight in Expert Testimony\*](#), 110 NW U. L. REV. 859 (2016).
- David L. Faigman, John Monahan & Christopher Slobogin, [\*Group to Individual \(G2i\) Inference in Scientific Expert Testimony\*](#), 81 U. CHI. L. 417 (2014).
- David L. Faigman, [\*The Daubert Revolution and the Birth of Modernity: Managing Scientific Evidence in the Age of Science\*](#), 46 U.C. DAVIS L. REV. 101 (2013).

## Part 4: Neuroscience in the Courtroom (with case studies)

**Presenters:** *Dr. Francis X. Shen*, Associate Professor of Law & McKnight Presidential Fellow, University of Minnesota; Executive Director of Education & Outreach for the MacArthur Foundation Research Network on Law and Neuroscience; Senior Fellow, Harvard Center for Law, Brain and Behavior

*Dr. Octavio Choi*, Director of Forensic Evaluation Services, Oregon State Hospital; Assistant Professor, Division of Public Psychiatry, Oregon Health and Science University

*Description and Learning Objectives:* Building in the previous sessions, this session will utilize case studies and real cases to explore the challenges of assessing neuroscientific evidence in both civil and criminal contexts. A variety of types of evidence will be considered through both lecture and discussion. After this part of the session, participants will be able to:

- Recognize the ways in which neuroscience is being proffered as evidence in criminal and civil contexts.
- Ask appropriate and productive questions when confronted with neuroscientific evidence.
- Reflect on legal doctrine and practice in light of emerging neuroscience research on legally relevant questions.

*The attached case studies, as well as the readings below, provide background for this session.*

- Stephen J. Morse, [\*Criminal Law and Common Sense: An Essay on the Perils and Promise of Neuroscience\*](#), 99 MARQUETTE L. REV. 39 (2015).
- Francis X. Shen, [\*Neuroscientific Evidence as Instant Replay\*](#), 3 J.L. & BIOSCIENCES 343 (2016).



## Part 5: Neuroscience of Aging and Dementia

**Presenter: Dr. Mark Mapstone**, Professor of Neurology, University of California Irvine;  
Member, UCI Institute for Memory Impairments and Neurological Disorders (UCI  
IMIND)

### Learning Objectives and Background Materials:

Following this part of the program, participants will be able to:

- Discuss the distinctions between normal cognitive aging, dementia, and Alzheimer's disease.
- Recognize some of the current policy and legal challenges related to the aging brain;
- Understand the current status of dementia clinical evaluation tools, as well as the state of development of new biomarkers.

*The attached case study, as well as materials provided via lecture utilizing the responder system, will provide additional material for this session.*

*The following background reading serves as a resource for judges in this area:*

- American Bar Association Commission on Law and Aging, American Psychological Association, National College of Probate Judges, [\*Judicial Determination of Capacity of Older Adults in Guardianship Proceedings: A Handbook for Judges\*](#) (2006).

## Part 6: Round Table Discussion

The round table discussion at the end of the day will serve as an opportunity for discussion on the many ways in which neuroscience may have legal implications. Drs. Shen and Mapstone will lead the round table discussion.