

Max Ostrinsky Krucoff, M.D.

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Professional Training

2013 – 2020 *Duke University Medical Center, Durham, NC*

Neurological Surgery Resident Physician

- USMLE Step 3: **252** (national mean 221 ± 17 SD)
- **Best Researcher** award as voted by residents/faculty 2015
- Neurosurgery vision and strategy group (2014 – present)

Education

2009 – 2013 *The George Washington University School of Medicine, Washington, DC*
M.D. with distinction

- USMLE Step 1: **251** (national mean 222 ± 24 SD); Step 2: **259** (237 ± 21)
- **Alpha Omega Alpha** medical honor society (2012 – present)
- Neurosurgery Rotations: Johns Hopkins (4 wks), Duke University (4 wks), GWU (4 wks), Children's National Medical Center (2 wks). Honors grades in all.
- Research track certificate

2003 – 2007 *McCormick School of Engineering, Northwestern University, Chicago, IL*

B.S. in Biomedical Engineering cum laude with departmental honors

- Cumulative GPA: **3.77**
- **Tau Beta Pi** engineering honor society (2005 – present)
- **Best Research** award for honors thesis in nanomaterials 2007
- Specialization: signals and imaging
- Minor in jazz studies, drumset performance

Peer Reviewed Publications

- M.O. Krucoff**, M. Chinn, P. Babington, Z. Litvack. "Controversial neuroendoscopic Monro foraminoplasty in the management of isolated lateral ventricle in an adult." *Interdisciplinary Neurosurgery*. June 2015.
- R. Flint, P. Wang, Z. Wright, C. King, **M.O. Krucoff**, S. Schuele, J. Rosenow, F. Hsu, C. Liu, J. Lin, M. Sazgar, D. Millett, S. Shaw, Z. Nenadic, A. Do, M. Slutzky. "Extracting kinetic information from human motor cortical signals." *Neuroimage*. August 2014.
- O. Adogwa, I. Karikari, K. Carr, **M.O. Krucoff**, D. Ajay, P. Fatemi, E. Perez, J. Cheng, C. Bagley, R. Isaacs. "Spontaneous Epidural Abscess in Patients 50-Years and Older: A 10-Year Institutional Perspective." *Journal of Neurosurgery:Spine*. Dec 2013.
- S. Khalsa, M. Chinn, **M.O. Krucoff**, and J. Sherman. "The Role of Stereotactic Radiosurgery for Multiple Brain Metastases in Stable Systemic Disease: A Review of the Literature." *Acta Neurochirurgica*. July 2013.
- A. Cherian, **M.O. Krucoff**, L. Miller. "Motor cortical prediction of EMG: Evidence that a kinetic brain machine interface may be robust across altered movement dynamics." *Journal of Neurophysiology*, Aug 2011.
- E. Pierstorff, **M.O. Krucoff**, D. Ho. "Apoptosis Induction and Attenuation of Inflammatory Gene Expression in Murine Macrophages via Multitherapeutic Nanomembranes," 2008 *Nanotechnology* 19, Issue 26.

**Peer Reviewed
Presentations/
Abstracts**

- O. Adogwa, T. Hodges, P. Thompson, P. Faterni, J. Martin, T. Darlington, K. Sharma, **M.O. Krucoff**, J. Cheng, R. Isaacs. "Outcomes After ALIF versus TLIF for Treatment of Symptomatic L5-S1 Spondylolisthesis: A Prospective, Multi-Institutional Comparative Effectiveness Study." 30th Annual Meeting of the American Academy of Neurosurgery (AANS) / Congress of Neurological Surgeons (CNS). March 2014. **Outcomes Committee Award.**
- O. Adogwa, P. Faterni, P. Thompson, **M.O. Krucoff**, J. Martin, T. Verla, G. Chagoya, K. Sharma, J. Cheng, R. Isaacs. "Clinical Benefit After Lumbar Interbody Fusion: A Prospective, Multi-Institutional Comparative Effectiveness Study of Outcomes After TLIF versus XLIF." 30th Ann. Meeting of the AANS/CNS. March 2014.
- P. Faterni, O. Adogwa, P. Thompson, R. Babu, T. Darlington, K. Sharma, **M.O. Krucoff**, J. Martin, J. Cheng, R. Isaacs. "Outcomes After Lumbar Spine Fusion Between Patients with Spondylolisthesis and Those with Degenerative Disc Disease (DDD): A Propensity Matched Prospective, Multi-Institutional Longitudinal Study of 1,741 Patients." 30th Ann. Meeting of the AANS/CNS. March 2014.
- O. Adogwa, I. Karikari, P. Thompson, P. Faterni, T. Darlington, K. Sharma, J. Martin, **M.O. Krucoff**, R. Isaacs. "Failure of Indirect Decompression with the Extreme Lateral Interbody (XLIF) Approach: A Study of Radiographic Factors." 30th Ann. Meeting of the AANS/CNS. March 2014.
- O. Adogwa, P. Faterni, T. Verla, P. Thompson, T. Darlington, J. Martin, **M.O. Krucoff**, J. Cheng, C. Bagley, O. Gottfried. "Lateral Interbody Fusion with Posterior Instrumentation Versus Laminectomy and Posterior Fusion: Early Intra-Operative and Post-Operative Complications in 157 Patients Undergoing Long Segment Fusion." 30th Ann. Meeting of the AANS/CNS. March 2014.
- O. Adogwa, T. Verla, P. Faterni, T. Darlington, P. Thompson, G. Chagoya, J. Cheng, **M.O. Krucoff**, S. Lad, C. Bagley, O. Gottfried. "Preoperative Serum Albumin Level as a Predictor of Postoperative Complication After Long Segment Spine Fusion." 30th Ann. Meeting of the AANS/CNS. March 2014.
- M.O. Krucoff**, M.W. Slutzky. "Predicting Grasp, Kinetic, and Kinematic Variables of Hand Movement Using Epidural and Subdural Signals." 63rd Annual Meeting of the American Academy of Neurology, April 12, 2011.
- M.O. Krucoff**, M.W. Slutzky. "Designing a Brain-Machine Interface for a Neurally-Controlled Prosthetic." The George Washington University Medical Center 16th Annual Research Day, March 2011. **Award nominee.**
- E. Pierstorff, **M.O. Krucoff**, D. Ho. "Multitherapeutic Hybrid Material Platforms for Nanoengineered Medicine," 3rd IEEE International Conference on Nano/Micro Engineered and Molecular Systems (NEMS), 3, 1124-1128, 2008. *Invited Manuscript.*
- E. Pierstorff, **M.O. Krucoff**, D. Ho. "Nanopolymeric Substrates for Cyto-Regulatory Gene Program Interrogation," 7th IEEE International Conference on Nanotechnology, 2007, 574-577. *Selected as oral presentation.*
- E. Pierstorff, **M.O. Krucoff**, D. Ho. "A Combinatorial Approach Towards Functionalizing Copolymers with Effector Molecules that Attenuate Cyto-inflammatory Responses at the Biotic-abiotic Interface," Materials Research Society Symposium, 2007, 1009:15-20. **Award nominee.**
- E. Pierstorff, **M.O. Krucoff**, D. Ho. "Multifunctional biofunctional substrate technology for localized inflammation suppression and insulin release," *IEEE Nanomedicine*, 2007. *Selected as oral presentation.*
- *S. Greenblum, ***M.O. Krucoff**, J. Furst, D. Raicu. "Automated Image Analysis of Noisy Microarrays," Proc. 2nd Intntl. Conf. on Cmptr. Vision Theory and Apps. Barcelona, Spain, March 2007. ***Shared first authorship.** Presented on a **National Science Foundation** grant.

Awards & Honors

Robert J. Lefkowitz Society, 2015 – present

- Department of Medicine, Duke University Medical Center

Best Researcher Award, 2015

- As voted by Department of Neurosurgery, Duke University residents and faculty

Outcomes Committee Award, 2014

- 30th Annual Meeting of the American Academy of Neurosurgery (AANS) / Congress of Neurological Surgeons (CNS)

Alpha Omega Alpha, 2012 – present

- Medical honor society

Medical Student Scholarship to the 63rd Annual Meeting of the American Academy of Neurology (AAN), 2011

- 1 of 40 students chosen nationwide

AAN Medical Student Summer Research Scholarship, 2010

- 1 of 20 students nationwide funded to pursue original research proposal

Best Research Award, 2007

- As voted by Department of BME, Northwestern faculty for senior honors thesis

Departmental Honors, 2007

- Department of BME, Northwestern University

Top Jazz Ensemble and Jazz Combo, 2007

- Bienen School of Music, Northwestern University
- One percussionist selected by audition, featured on official recordings

Tau Beta Pi, 2005 – present

- Engineering honor society

Work/Research Experience

2013 - present *Duke University School of Medicine* Durham, NC

- Principle Investigator: **Miguel Nicolelis, M.D., Ph.D.**
- **Post-doctoral** work in **brain-machine interfacing (BMI)**
- Applying a brain-controlled kinematic lower extremity exoskeleton to a reversible model for paraplegia in monkeys
- Implanting cortical and deep electrodes in primates for chronic recordings
- Examining neuronal tuning and plasticity networks during BMI learning

2010 *Feinberg School of Medicine, Northwestern Univ.* Chicago, IL

- Principle Investigator: **Marc Slutzky, M.D., Ph.D.**
- **Human brain-machine interface** research funded by the American Academy of Neurology (AAN)
- Predicted a patient's grasp, as well as kinetic and kinematic variables of his hand and finger movement, by using epidural and subdural brain signals (ECoG)

2007 - 2009 *Feinberg School of Medicine, Northwestern Univ.* Chicago, IL

- Principle Investigator: **Lee Miller, Ph.D.**
- **Brain-machine interfacing (BMI)** with chronically implanted non-human primate models
- Functional electrical stimulation with brain control to restore grasp in primates
- Encoding of the motor cortex

- 2006 - 2007 *Northwestern University Department of BME* Evanston, IL
- Principle Investigator: **Dean Ho, Ph.D, M.S.**
 - Award-winning senior honors thesis in **nanomaterials**
 - Functionalized a 4nm-thin copolymer with anti-inflammatory drug demonstrated decreased levels of expression of inflammatory gene IL-6 compared to controls

- Summer 2006 *Northwestern University, DePaul CTI* Chicago, IL
- Principle Investigator: **Jacob Furst, Ph.D.**, DePaul CTI.
 - Medical informatics internship, Research Experience for Undergraduates (REU), funded by the **National Science Foundation**
 - DNA microarray image processing with data from **Argonne National Laboratories**
 - Generated automated algorithms that analyzed noisy DNA microarrays

**Hobbies
& Interests**

- 1995 - present *Jazz Drumset* Chicago, IL; Washington DC
- Played professionally for many years
 - In 2009 recorded the CD *Joy Not Jaded* with The Moshier-Lebrun Collective which contained compositions that won the following awards:
 - 2010 ASCAP Young Jazz Composers Award (Song: King's Road)
 - 2010 Union Arts League Jazz Composition Award (Song: Who Shall Excel Them)
 - **2009 Chamber Music America New Jazz Works Grant (\$20,000)**
 - 2008 Best Small Group Song (Jambo), International Jazz Composers Conference