

# Sanjay M. Prakadan

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## EDUCATION

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**Massachusetts Institute of Technology**, Cambridge, MA  
**Doctorate of Philosophy**, Chemistry, June 2019 (expected)  
Affiliations: The Broad Institute, The Ragon Institute, The Koch Institute

**The University of Chicago**, Chicago, IL  
**Bachelor of Arts**, Chemistry March 2014  
Honors: Dean's List (All Terms), General Honors, Departmental Honors  
Thesis: Analysis of Dynamic Behavior in Block Copolymer and Nanolayered Polymer Thin Films

## EXPERIENCE

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**Massachusetts Institute of Technology**, Cambridge, MA  
**Graduate Research Assistant**, November 2014 – Present, advised by Alex K. Shalek  
Investigating systems-level cellular behavior in human cancer using single-cell technologies. In particular, studying the evolution and response of tumor microenvironments to therapeutic challenge through liquid biopsies and compartments.

**Massachusetts Institute of Technology**, Cambridge, MA  
**Research Assistant**, June 2014 – August 2014, advised by Jeremiah Johnson and Niels Holten-Anderson  
Investigated structure of metallosupramolecular nanosphere assemblies by IR and Raman spectroscopy. Designed and synthesized carboxylic acid derivative ligands for polymerization of novel nanospheres.

**James Franck Institute**, Chicago, IL  
**Undergraduate Researcher**, January 2012 – March 2014, advised by Steven J. Sibener  
Investigated effects of external constraints on ordering of microdomains in PS-b-PMMA Built and operated UHV chambers designed to conduct experiments on polymer thin films

## PUBLICATIONS

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- 1) Prakadan SM\*, Alvarez-Breckenridge C\*, et al, "Cellular dynamics of response to checkpoint blockade inhibitor therapy in leptomeningeal disease." *In Preparation*.
- 2) Hamza B\*, Ng SR \*, Prakadan SM\*, et al, "Longitudinal single-CTC RNA-Seq analysis from a genetically engineered mouse model of small cell lung cancer." *In Review*. 2018.
- 3) Lossos C, Liu Y, Kolb KE, Christie A, Van Scoyk A, Prakadan SM, et al, "Alkylating Agent-Induced ER Stress Overcomes Microenvironmental Resistance to Lymphoma Therapy." *Submitted*. 2018.
- 4) Kimmerling RJ, Prakadan SM, et al, "Linking measurements of size, growth-rate, and gene expression." *bioRxiv* **331686**; <https://doi.org/10.1101/331686> (2018).
- 5) Nirschl CJ\*, Suarez-Farinas M\*, Izar B, Prakadan SM, et al, "Homeostatic monophagocyte signatures regulate anti-tumor immunity." *Cell*. **170**, 127-141 (2017).
- 6) Prakadan SM, Shalek AK, Weitz DA. "Scaling by shrinking: Empowering single-cell 'omics' with microfluidic devices." *Nature Reviews Genetics*. **18**, 345-361 (2017).

### Cover Feature of Nature Reviews Genetics Volume 18, Issue 6

- 7) Genshaft AS\*, Li S\*, Gallant CG, Darmanis S, Prakadan SM, et al, "Multiplexed targeted profiling of a cell's proteome and transcriptome in a single reaction." *Genome Biology*. **17**, 188 (2016).
- 8) Tirosch I\*, Izar B\*, Prakadan SM, et al, "Dissecting the multicellular ecosystem of metastatic melanoma by single-cell RNA-Seq." *Science*. **352**, 189-196 (2016).

### Cover Feature of Science Volume 352, Issue 6282

\* denotes shared authorship

## PROFESSIONAL AND COMMUNITY ACTIVITIES

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**Environmental Health & Safety Officer**, January 2015 – Present  
Facilitated and managed safety and compliance of the Shalek Lab with local and national safety authorities  
**MIT Chemistry Teaching Assistant**, September – December 2014 & 2015

Member of the Principles of Chemical Science teaching team during fall semester of 2014 & 2015  
**Society of Women in Physics**, January 2014  
Facilitated and participated in photography for Midwestern Conference for UG Women in Physics  
**Splash! Chicago Volunteer**, October 2013  
Coordinated and participated in education initiative program for high school students  
**Physics with a Bang Volunteer**, December 2012 & 2013  
Science outreach through James Franck Institute, led lab tours and demonstrations for public

#### **AWARDS AND MERITS**

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**Moore Foundation:** Moore Graduate Fellowship (2015)  
**HHMI:** MIT-HHMI Teaching Fellowship (2014)  
**University of Chicago Department of Chemistry:** Gordon A. Noble Travel Grant (2013)  
**University of Chicago MRSEC:** Research Experience for Undergraduates (2012 & 2013)  
**American Chemical Society:** ACS Physical Chemistry Undergraduate Symposium Invitee (2013)

#### **SKILLS**

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Expertise in single-cell biology, single-cell analysis, cancer biology, and cancer immunology  
Mammalian cell culture & tissue dissection  
RNA/DNA library preparation  
Preprocessing & analysis of next-generation sequencing data  
Analysis of single-cell RNA-Sequencing data  
Big data and high dimensional statistics  
Experience in R, Unix, Adobe Photoshop and Illustrator  
Design and operation of UHV systems  
FACS, Infrared, Raman, & Nuclear Magnetic Resonance Spectroscopy  
Atomic Force & Scanning Electron Microscopy

#### **PRESENTATIONS**

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World Preclinical Congress International Meeting; Boston, MA; June 2017  
Towards the promise of single-cell genomics in the clinic.  
[Sanjay M. Prakadan](#), Alex K. Shalek  
Klarman Cell Observatory; Cambridge, MA; June 2017  
Guiding single-cell RNA-Seq analysis with cellular metadata.  
[Sanjay M. Prakadan](#), Alex K. Shalek  
Broad Institute-ISF Cellular Circuits Symposium; Jerusalem, Israel; June 2015  
The Shalek Lab: Developing and Applying Novel Tools for Systems Biology  
Travis K. Hughes, [Sanjay M. Prakadan](#), Alex K. Shalek  
ACS National Meeting Undergraduate Research Symposium; Indianapolis, IN; September 2013  
Photodegradation of Poly(methyl methacrylate) with a Polystyrene Thin Film Cap  
[Sanjay M. Prakadan](#), Steven J. Sibener

#### **PATENTS**

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Tumor and microenvironment gene expression, compositions of matter and methods of use thereof. (2015).

#### **SERVICE**

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As reviewer with Alex K. Shalek for:	PloS One Biology
As reviewer with Alex K. Shalek for:	Nature Communications
As reviewer with Scott R. Manalis for:	Nature Methods
As reviewer with Alex K. Shalek for:	Cell

#### **REFERENCES**

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Dr. Alex K. Shalek Professor of Chemistry <a href="mailto:shalek@mit.edu">shalek@mit.edu</a>	Dr. Scott R. Manalis Professor of Bioengineering <a href="mailto:srm@mit.edu">srm@mit.edu</a>	Dr. Adam P. Willard Professor of Chemistry <a href="mailto:awillard@mit.edu">awillard@mit.edu</a>
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#### **INTERESTS**

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Semi-professional Latin dancer  
Amateur table-tennis player