

## **Jonathan T. Szczepanski, Ph.D.**

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### **EDUCATION**

#### **The Scripps Research Institute, Department of Chemistry, La Jolla, CA**

- Postdoctoral Fellow with Professor Gerald F. Joyce, Nov. 2010 – June 2015
- Recipient of the NIH Ruth L. Kirschstein National Research Service Award (F32)

#### **The Johns Hopkins University, Department of Chemistry, Baltimore, MD**

- Graduate research with Professor Marc M. Greenberg, June 2005 – Nov. 2010
- Ph.D., Chemistry, Oct. 2010
- M.A., Chemistry, Oct. 2007
- Recipient of the Sonneborn Fellowship awarded for excellence in research

Thesis: *The reactivity of abasic DNA lesions within naked DNA and nucleosome core particles*

#### **The University of Minnesota, Department of Chemistry, Minneapolis, MN**

- Undergraduate research with Professor Steven R. Kass, Sept. 2003 – May 2005
- B.S., Chemistry, May 2005
- Recipient of the Heisig Research Fellowship
- Participant in the Undergraduate Research Opportunity Program

### **PROFESSIONAL EXPERIENCE**

2015 – present      Assistant Professor of Chemistry, Texas A&M University  
2015 – present      CPRIT Scholar in Cancer Research, Texas A&M University

### **HONORS AND AWARDS**

2017    NIH Maximizing Investigators' Research Award (MIRA)  
2015    Cancer Prevention and Research Institute of Texas (CPRIT) Scholar  
2012    NIH Ruth L. Kirschstein National Research Service Award  
2009    Sonneborn Fellowship, Johns Hopkins University  
2007    Ernest M. Marks Award, Johns Hopkins University  
2005    Undergraduate Research Opportunity Program, University of Minnesota  
2005    Heisig Research Fellowship, University of Minnesota

## **PUBLICATIONS**

8. Dey, S., Hall, I., Kabza, A. M., **Sczepanski, J. T.\*** Isolation and Characterization of Chemically Modified L-DNA Aptamers that Bind a Structured RNA Molecule (Manuscript in preparation).
7. Banerjee, D. R.<sup>†</sup>, Deckard, C. E., III<sup>†</sup>, **Sczepanski, J. T.\*** Acetylation of the Histone H3 Tail Domain Regulates Base Excision Repair on Higher-Order Chromatin Structures (Submitted).
6. Young, B. E., Kundu, N., **Sczepanski, J. T.\*** Mirror-Image Oligonucleotides: History and Emerging Applications. *Chem. Eur. J.* DOI: 10.1002/chem.201900149 (2019).
5. Zhong, W., **Sczepanski, J. T.\*** A Mirror Image Fluorogenic Aptamer Sensor for Live-Cell Imaging of MicroRNAs. *ACS Sens.* **4**, 566–570 (2019).
4. Deckard, C. E., **Sczepanski, J. T.\*** Polycomb Repressive Complex 2 Binds RNA Irrespective of Stereochemistry. *Chem. Commun.* **54**, 12061–12064 (2018). Article highlighted in *C&E News* (Vol. 96, October 15, 2018).
3. Banerjee, D. R.<sup>†</sup>, Deckard, C. E., III<sup>†</sup>, Elinsky, M. B., Batteas, J. D., **Sczepanski, J. T.\*** A Plug-and-Play Approach for Preparing Chromatin Containing Site-Specific DNA Modifications: The Influence of Chromatin Structure on Base Excision Repair. *J. Am. Chem. Soc.* **140**, 8260–8267 (2018).
2. Kabza, A. M., Young, B. E., **Sczepanski, J. T.\*** Heterochiral DNA Strand-Displacement Circuits. *J. Am. Chem. Soc.* **139**, 17715–17718 (2017).
1. Kabza, A. M., **Sczepanski, J. T.\*** An L-RNA Aptamer with Expanded Chemical Functionality Inhibits MicroRNA Biogenesis. *ChemBioChem* **18**, 1824–1827 (2017).

### **\*Corresponding Author**

Before Texas A&M University

14. **Sczepanski, J. T.**, Joyce, G. F. Specific Inhibition of MicroRNA Processing Using L-RNA Aptamers. *J. Am. Chem. Soc.* **137**, 16032–16037 (2015).
13. **Sczepanski, J. T.**, Joyce, G. F. A Cross-Chiral RNA Polymerase Ribozyme. *Nature* **515**, 440–442 (2014). This article was highlighted in *Nature News & Views* (*Nature* **515**, 347–348 [2014]) and *C&E News* (*Chem. Eng. News* **92**, 39 [2014]).
12. **Sczepanski, J. T.**, Joyce, G. F. Binding of a Structured D-RNA Molecule by an L-RNA Aptamer. *J. Am. Chem. Soc.* **135**, 13290–13293 (2013).
11. Zhou, C.; **Sczepanski, J. T.**, Greenberg, M. M. Histone Modification via Rapid Cleavage of C4'-Oxidized Abasic Sites in Nucleosome Core Particles. *J. Am. Chem. Soc.* **135**, 5274–5277 (2013).

10. **Sczepanski, J. T.**, Zhou, C., Greenberg, M. M. Nucleosome Core Particle-Catalyzed Strand Scission at Abasic Sites. *Biochemistry* **52**, 2157–2164 (2013).
9. **Sczepanski, J. T.**, Joyce, G. F. Synthetic Evolving Systems that Implement a User-Specified Genetic Code of Arbitrary Design. *Chem. Biol.* **19**, 1324–1332 (2012).
8. Zhou, C.; **Sczepanski, J. T.**, Greenberg, M. M. Mechanistic Studies on Histone Catalyzed Cleavage of Apyrimidinic/Apurinic Sites in Nucleosome Core Particles. *J. Am. Chem. Soc.* **134**, 16734–16741 (2012).
7. **Sczepanski, J. T.**, Hiemstra, C. N., Greenberg, M. M. Probing DNA Interstrand Cross-Link Formation by an Oxidized Abasic Site Using Nonnative Nucleotides. *Bioorg. Med. Chem.* **19**, 5788–5793 (2011).
6. **Sczepanski, J. T.**, Wong, R. S., McKnight, J. N., Bowman, G. D., Greenberg, M. M. Rapid DNA-Protein Cross-Linking and Strand Scission by an Abasic Site in a Nucleosome Core Particle. *Proc. Natl. Acad. Sci. USA.* **107**, 22475–22480 (2010).
5. Wong, R. S., **Sczepanski, J. T.**, Greenberg, M. M. Excision of a Lyase-Resistant Oxidized Abasic Lesion from DNA. *Chem. Res. Toxicol.* **23**, 766–770 (2010).
4. Greenberg, M. M., Newman, C. A., Resendiz, M., **Sczepanski, J. T.** Photochemical Generation and Reactivity of 5,6-Dihydrouridin-6-yl Radical. *J. Org. Chem.* **74**, 7007–7012 (2009).
3. **Sczepanski, J. T.**, Jacobs, A., Van Houten, B., Greenberg, M. M. Double-Strand Break Formation During Nucleotide Excision Repair of a DNA Interstrand Cross-Link. *Biochemistry* **48**, 7565–7567 (2009). This article was highlighted in *Chemical Research in Toxicology* (*Chem. Res. Toxicol.* **22**, 1651 [2009]).
2. **Sczepanski, J. T.**, Jacobs, A., Majumdar, A., Greenberg, M. M. Scope and Mechanism of Interstrand Cross-Link Formation by the C4'-Oxidized Abasic Site. *J. Am. Chem. Soc.* **131**, 11132–11139 (2009).
1. **Sczepanski, J. T.**, Jacobs, A., Greenberg, M. M. Self-Catalyzed DNA Interstrand Cross-Link Formation by an Abasic Site. *J. Am. Chem. Soc.* **130**, 9646–9647 (2008). This article was highlighted in *Chemical Research in Toxicology* (*Chem. Res. Toxicol.* **21**, 1650 [2008]) and chosen for *JACS Select* collection focused on nucleic acids (Vol. 4).

## **PATENTS**

1. Deckard, C. E. III, **Sczepanski, J. T.\*** L-Oligonucleotide Inhibitors of Polycomb Repressive Complex 2 (PRC2) (U.S. Application No. 62/729,124; Filed: September 11, 2018).
2. Kabza, A. M., Young, B. E., **Sczepanski, J. T.\*** Heterochiral DNA Strand-Displacement Reactions and Circuits (U.S. Application No. 62/626,124; Filed: February 4, 2018).

**\*Lead Author**

## TEACHING

### **Texas A&M University, College Station, TX**

- Chemistry 227: Organic Chemistry I, Spring 2016 (Instructor)
- Chemistry 227: Organic Chemistry I, Fall 2016 (Instructor)
- Chemistry 689: Nucleic Acids Chemistry, Spring 2018 (Instructor)
- Chemistry 227: Organic Chemistry I, Fall 2018 (Instructor)
- Student Committees: Peng-Hsun Chen (Liu, Chemistry), Sopida Thavornpradit (Burgess, Chemistry), Jonathan Whisenant (Burgess, Chemistry), Yuchen Qiao (Liu, Chemistry), Aaron Jacobson (Burgess, Chemistry), Andrew Collins (Menet, Biology), Syed Muhammad (Burgess, Chemistry), Bosheng Zhao (Burgess, Chemistry), Kaci Kratch (Liu, Chemistry), Sreyashree Bose (Shippen, BioBio)
- Regents Scholars Program (Instructor)
- Chemistry Open House, Summer 2017, KHP Activity and Demonstration Development Grant Awardee

### **The Scripps Research Institute, La Jolla, CA**

- Guest lecture: Structural Biology 216, *Alphabet 2: Nucleic Acids – Chemistry and Secondary Structure*, Ian Wilson director, September 2014

### **Johns Hopkins University, Baltimore, MD**

- Teaching Assistant: Organic Chemistry I and Organic Chemistry II (AS.030.205 and AS.030.205, respectively)
- Teaching Assistant: Intermediate Organic Chemistry Laboratory (AS.030.228), Ernest M. Marks Award for excellence in teaching, 2007

## SEMINARS AND OTHER PRESENTATIONS

- 4/19 Department of Chemistry, University of Delaware, Newark, DE (Invited Seminar)
- 4/19 Department of Chemistry, Johns Hopkins University, Baltimore, MD (Invited Seminar)
- 4/19 Department of Chemistry, University of Maryland, College Park, MD (Invited Seminar)
- 1/19 Gordon Research Conference: RNA Nanotechnology, Ventura, CA (Invited Seminar)
- 10/18 Truman State University, Kirksville, MI (Recruitment Seminar)
- 8/18 Aptamers in Boulder, Boulder, CO (Invited Seminar)
- 5/18 Institute of Biosciences & Technology, Texas A&M College of Medicine, Houston, TX (Invited seminar)
- 4/18 Texas Southern University, Houston, TX (Recruitment Seminar)
- 3/18 255<sup>th</sup> American Chemical Society National Meeting, New Orleans, LA (Seminar, Early Career Investigator Session, BIOL)
- 11/17 Department of Biochemistry, Texas A&M University, College Station, TX (Invited Seminar)
- 6/17 Gordon Research Conference: Nucleosides, Nucleotides, and Oligonucleotides, Newport, RI (Poster)
- 5/17 11<sup>th</sup> RNA Consortium Meeting, City of Hope, Los Angeles, CA (Invited Seminar)
- 4/17 ENG-LIFE Workshop, Texas A&M University, College Station, TX (Invited Seminar)
- 2/17 Keystone Symposia, Noncoding RNAs: From Disease to Targeted Therapeutics, Alberta, Canada (Selected Short Talk)
- 6/16 Aptamers in Bordeaux, Bordeaux, France (Poster)

- 5/16 NIH Mentoring Workshop for New Faculty in Organic and Biological Chemistry, Dallas, TX (Selected Participant)
- 4/16 Department of Biology, Texas A&M University, College Station, TX (Invited Seminar)
- 1/16 College of Science Big Data Workshop, Texas A&M University, College Station, TX (Invited Seminar)
- 10/15 External Advisory and Development Council, Texas A&M University, College Station, TX (Invited Seminar)
- 10/15 Keck Institute for Space Studies, *Don't Follow (Just) the Water: Does Life Occur in Non-Aqueous Media?* Pasadena, CA (Workshop Participant)

Before Texas A&M University

- 11/14 Faculty recruitment seminar, Texas A&M University, College Station, TX (Invited Seminar)
- 10/14 Cell Symposia on Regulatory RNAs, Berkeley, CA (Poster)
- 7/14 The Fourteenth International Conference on the Synthesis and Simulation of Living Systems, New York, NY (Selected Seminar)
- 3/12 243<sup>rd</sup> American Chemical Society National Meeting, San Diego, CA (Seminar)
- 8/09 238<sup>th</sup> American Chemical Society National Meeting, Washington, DC (Poster)
- 8/08 236<sup>th</sup> American Chemical Society National Meeting, Philadelphia, PA (Poster)
- 8/08 Conference on Chemical Insights into Biological Processes (Poster)

**UNIVERSITY SERVICE**

Department of Chemistry Faculty Search Committee	2018
Chemistry Open House (Participant)	2018
Departmental Recruiting, Truman State University, Kirksville, MI	2018
Texas A&M University Radiological Safety Committee (Voting Member)	2018–present
Departmental Recruiting (NOBCChe), Texas Southern, University, Houston, TX	2018
Chemistry Open House (Participant)	2017
Faculty Liaison to GSAC	2016
Department of Chemistry Faculty Search Committee	2016
EADC Road Scholar Program	2016
Department of Chemistry Head Search Committee	2016
Department of Chemistry Faculty Search Committee	2015

**SERVICE OUTSIDE TEXAS A&M**

**a. Professional Affiliations**

The RNA Society  
 American Chemical Society  
 American Association for the Advancement of Science

**b. Referee of Journal Articles**

*Proceedings of the National Academy of Sciences USA*  
*Nucleic Acids Research*  
*ACS Sensors*

ACS Chemical Biology  
Journal of the American Chemical Society  
ChemBioChem  
Biochemistry  
Communications Chemistry  
Chem  
Chemical Society Reviews

## **RESEARCH GRANTS – CURRENT**

Cancer Prevention and Research Institute of Texas (CPRIT) RR15038 (PI: Sczepanski) <i>“Recruitment of First-Time Tenure-Track Assistant Professor”</i>	06/01/15 – 12/31/19 \$2,000,000
The Welch Foundation A-1909 (PI: Sczepanski) <i>“Development of Cross-Chiral Nucleic Acid Biosensors for Detection of RNA Structure”</i>	06/01/16 – 05/31/19 \$195,000
National Institutes of Health (NIH) NIGMS Maximizing Investigators’ Research Award (MIRA) R35GM124974 (PI: Sczepanski) <i>“Mirror Image Aptamers: Next Generation RNA-Binding Reagents for Basic Research and Therapeutic Applications”</i>	09/15/17 – 09/14/22 \$1,250,000
National Institutes of Health (NIH) R35GM124974 (PI: Sczepanski) <i>“Mirror Image Aptamers: Next Generation RNA-Binding Reagents for Basic Research and Therapeutic Applications: Administrative Supplement for Equipment”</i>	09/12/18 \$100,000
The RNA Society <i>“Establishment of the Aggieland RNA Salon”</i>	09/27/18 – 09/26/19 \$1,000

## **RESEARCH GRANTS – CONCLUDED**

Strategic Transformative Research Program (PI: Sczepanski) Texas A&M University <i>“RNApex: A Genetically Encoded Electron Microscopy Reporter for RNA”</i>	09/01/17 – 08/31/18 \$50,000
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