

Jonathan Konstantine **Sakkos**

MECHANICAL ENGINEER

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Education

University of Minnesota

Minneapolis, MN

PH.D. CANDIDATE IN MECHANICAL ENGINEERING

2012 – Spring 2018 (expected)

- Advisor: Alptekin Aksan, Ph.D.
- Co-advisor: Lawrence P. Wackett, Ph.D.
- Thesis: “Engineering Biocatalytic Materials: Encapsulation Systems for Bioremediation”

University of Portland

Portland, OR

B.S. IN MECHANICAL ENGINEERING

2005-2009

Skills

Field Expertise	Sol-Gel Synthesis, Polymeric Biomaterials, Bioencapsulation, Material Characterization, Mass Transport
Characterization Techniques	SEM, FTIR, GC-MS, UV-Vis Spectroscopy, Confocal Microscopy, Mechanical Compression, Contact Angle
Software	Matlab, Python, LaTeX, SolidWorks, AutoCAD

Publications

PEER-REVIEWED JOURNAL ARTICLES

1. J.J. Benson, **J.K. Sakkos**, L.P. Wackett, A. Aksan. Enhanced biodegradation of atrazine by bacteria encapsulated in organically modified silica gel. (accepted, *Journal of Colloids and Interfaces*).
2. **J.K. Sakkos**, B.R. Mutlu, L.P. Wackett, A. Aksan. Adsorption and biodegradation of aromatic chemicals by bacteria encapsulated in a hydrophobic silica gel. *ACS Applied Materials & Interfaces* 2017 9 (32), 26848-26858.
3. B.R. Mutlu, **J.K. Sakkos**, S. Yeom, L.P. Wackett, A. Aksan. Silica ecosystem for synergistic biotransformation. *Scientific Reports* 2016, 6, 27404.
4. **J.K. Sakkos**, D.P. Kieffer, B.R. Mutlu, L.P. Wackett, A. Aksan. Engineering of a Silica Encapsulation Platform for Hydrocarbon Degradation Using *Pseudomonas* sp. NCIB 9816-4. *Biotechnology and Bioengineering* 2015, 113 (3), 513–521.

CONFERENCE PROCEEDINGS

1. **J.K. Sakkos**, D.P. Kieffer, B.R. Mutlu, L.P. Wackett, A. Aksan “Design of Porous Silica Gels for Bioremediation of Aromatic Hydrocarbons” *Northeast Bioengineering Conference*, Troy, NY, USA, 2015.

MANUSCRIPTS IN PREPARATION

1. **J.K. Sakkos**, L.P. Wackett, A. Aksan, “Designing microbial exoskeleton for enhanced biocatalyst reactivity.”
2. S. Yeom, **J.K. Sakkos**, A. Aksan, L.P. Wackett, “Remediation of atrazine spills via adsorption and biodegradation using hydrophobic bio-silica particles.”
3. M. Schwab, C. Bergonzi, **J.K. Sakkos**, A. Aksan, M. Elias, “Encapsulation of lactonase expressing bacteria for biofilm prevention.”
4. R. Han, S. Yeom, **J.K. Sakkos**, B.R. Mutlu, A. Aksan, M. McAlpine, “3D-Printed Silica Bioreactor for Atrazine Remediation.”

PUBLIC OUTREACH

1. **J.K. Sakkos**, r/Science. “Science AMA Series: I’m Jonathan Sakkos, a graduate student in mechanical engineering at the University of Minnesota. I trap bacteria within porous materials for cleaning pollutants from water. AMA!” *The Winnower* 2016.

Patents

1. Wackett, L.P., Aksan, A., **Sakkos, J.K.**, Dodge, T., 2017, "Cyanuric Acid Remediation," U.S. Patent Application Number 62/486,491.
2. Radian, A., Mutlu, B. R., **Sakkos, J.K.**, Aksan, A., Wackett, L. P., 2015, "Compositions Including A Silica Matrix And Biomaterial, Methods Regarding The Same And Uses Thereof," U.S. Patent Application Number 14/883,053

Conference Presentations

5th International Conference on Multifunctional, Hybrid and Nanomaterials

Lisbon, Portugal

POSTER PRESENTATION

2017

- **J. K. Sakkos**, B.R. Mutlu, L. P. Wackett, A. Aksan "Bioregeneration of Ormosil gel for remediation of PAHs from water"
- **J. K. Sakkos**, B.R. Mutlu, L. P. Wackett, A. Aksan "Engineering of a Silica Encapsulation Platform for Hydrocarbon Degradation using *Pseudomonas* sp. NCIB 9816"

Summer Biomechanics, Bioengineering, and Biotransport Conference

National Harbor, MD

POSTER PRESENTATION

2016

- **J. K. Sakkos**, L. P. Wackett, A. Aksan "Microbial Regeneration of Adsorbent Silica Gel for Sustainable Treatment of Environmental Pollutants"
- G. Heo, **J. K. Sakkos**, S. Yeom, L. P. Wackett, A. Aksan "Bacterial Growth Inside Reversible Ca-alginate Beads Encapsulated in a Thin Silica Film"

University of Minnesota MnDRIVE Environment Symposium

Minneapolis, MN

POSTER PRESENTATION

2016

- B. R. Mutlu, **J. K. Sakkos**, S. Yeom, L. P. Wackett, A. Aksan "Silica ecosystem for synergistic biotransformation"

Materials Research Society Fall Meeting

Boston, MA

POSTER PRESENTATION

2015

- **J. K. Sakkos**, D. P. Kieffer, B.R. Mutlu, L. P. Wackett, A. Aksan "Organic Modification of Silica Gels with Encapsulated *Pseudomonas* sp. NCIB 9816 for Enhanced Biodegradation of Aromatic Hydrocarbons"

Battelle Bioremediation Symposium

Miami, FL

PLATFORM TALK

2015

- **J. K. Sakkos**, D. P. Kieffer, B.R. Mutlu, L. P. Wackett, A. Aksan, "Design of Porous Silica Gels for Biodegradation of Aromatic Hydrocarbons"

Northeast Bioengineering Conference

Troy, NY

PLATFORM TALK

2015

- **J. K. Sakkos**, D. P. Kieffer, B.R. Mutlu, L. P. Wackett, A. Aksan "Design of Porous Silica Gels for Biodegradation of Aromatic Hydrocarbons"

Experience

Bioencapsulation Lab - University of Minnesota

Minneapolis, MN

RESEARCH ASSISTANT

2012-Present

- Studied bioencapsulation (physical confinement) of bacteria for applications in biotechnology
- Synthesized new porous materials for bioencapsulation
- Performed materials characterization on novel materials

Columbia Steel Casting Co.

Portland, OR

PRODUCT ENGINEER

2009-2012

- Designed replacement wear parts for heavy scrap shredders
- Modeled parts and assemblies in SolidWorks, created 2D drawings in AutoCAD
- Coordinated part design with pattern shop and foundry to avoid production issues
- Redesigned parts to ensure better performance, longer life
- Played a major role in the product development process, from Engineering Request all the way up to quoting and sales
- Coordinated with salesmen in order to provide the best possible service to our customers

Columbia Steel Casting Co.

Portland, OR

PRODUCT ENGINEER-INTERN

2007-2009

- Worked with an Engineer on various projects
- Designed replacement wear parts for heavy scrap shredders. Modeled parts and assemblies in SolidWorks, created 2D drawings in AutoCAD

County of Sonoma

Santa Rosa, CA

ENGINEERING TECH. I

May, 2006 - Aug, 2006

- Performed materials testing. Field and laboratory tests included: compaction, sand equivalent, gradation, in place density, moisture content

Honors & Awards

- 2017 **Joachim and Yuko Heberlein Award**, Department of Mechanical Engineering, University of Minnesota *Minneapolis, MN*
- 2015 **BioTechnology Institute Travel Award**, University of Minnesota *Minneapolis, MN*
- 2012 **Fellowship**, Department of Mechanical Engineering, University of Minnesota *Minneapolis, MN*
- 2008-2009 **Dean's List**, University of Portland *Portland, OR*
- 2005-2009 **President's Scholarship**, University of Portland *Portland, OR*

Undergraduate Students Supervised

- Meera Harihara *Jan. 2016 - July 2016*
- Daniel P. Kieffer *Dec. 2013 - Dec. 2015*
- Amanda Eidem *Jan. 2013 - Jan. 2014*
- James Bienieck *Sept. 2013 - June 2014*
- Kanav Khosla *Jan. 2013 - May 2013*