

October Section Meeting: Spiders! Engineering Spider Silk

Spider silks are comprised of a diverse family of proteins both in terms of sequence as well as mechanical properties. Some are as strong as Kevlar, some have the elasticity of rubber bands, while others behave nearly like glass. Despite a tremendous amount of information generated in the past 20 years, it is still unknown how these differing mechanical properties arise. Some of the variation is due to the differences in protein sequences, but the spinning process by the spider can also greatly influence the fiber properties. Current research at the University of Wyoming includes sequencing of the various silk proteins from the golden orb weaving spider, engineering synthetic analogues, optimizing production in recombinant systems including goats' milk, developing synthetic fiber spinning processes, and the evaluation of the silk materials for biomedical applications.

Despite a strong demand for new technologies in the field of tissue engineering and biomaterials, only a limited set of both synthetic and natural materials have been characterized and even fewer have found use in practical applications. Dragline spider silk is an intriguing candidate for the next generation of medical biomaterials because of its high tensile strength and elasticity along with its inherent biocompatibility and non-toxicity. With the development of recombinant spider silk production in *E. coli* and the milk of genetically engineered goats, enough material can finally be generated to develop new methods to spin synthetic spider silk fibers and test them in material applications.

(continued on page 2)

October Section Meeting

- Topic:** Spiders! Engineering Spider Silk
(A Halloween Special)
- Speaker:** Dr. Patrick A. Johnson,
Assistant Professor, Dept. of
Chemical & Petroleum Engineering
University of Wyoming, Laramie
- Date:** Tuesday, October 20th
- Time:** 5:30-6:00 Tour Engineering Labs
6:00-7:00 Dinner/Presentation
7:00-7:30 Tour Engineering Labs
- Location:** University of Wyoming, Laramie
Engineering Building Room 1062
- Cost:** Members: \$20
(w/RSVP)* Non-Members: \$25
Students & Unemployed: \$10
- Please RSVP by Friday, October 16th (early RSVPs are greatly appreciated!) indicating your name, phone number, and number of attendees. Please RSVP to Martin Vorum by phone at 303-384-7414 or email at rockyaiche@yahoo.com.

*Add \$5 for attending meeting without RSVP

(continued from page 1)

Dr. Patrick Johnson of the Department of Chemical Engineering at the University of Wyoming will discuss his current collaborations with renowned molecular biologist, Dr. Randy Lewis. The interactive talk will include demonstration items of natural and synthetic silk materials and of course, the golden orb weaving spider, *Nephilia clavipes*, itself.

Dr. Johnson received a B.S. in Chemical Engineering from Lehigh University, a Master's degree in Biomedical Engineering from the University of Virginia, and a Ph.D. in Chemical Engineering from Columbia University. He had previously worked for ITT Industries in Alexandria, VA under Department of Defense contracts for the detection of biological and chemical weapons.

The talk and dinner will be held at the University of Wyoming in the Engineering Building, Room 1062. Parking is free after 5 pm and lots can be found on Lewis or Bradley Streets between 11th and 12th Streets. A detailed campus map can be found at: <http://www.uwyo.edu/tour/campusmap.pdf> or an interactive version at: <http://www.uwyo.edu/tour/campusmap.asp>. Best route to Laramie is to take I25N to Rte 80 W, Exit 313, right on 3rd St / 287 N to right on Lewis Street. Alternatively take 287 N directly from Ft. Collins until it becomes 3rd St to right on Lewis Street.



Engineers Without Borders Annual Wine Tasting

The Denver Professional Chapter of Engineers Without Borders (EWB) is holding its annual wine tasting event in November. This is an event for us to celebrate a year's of project successes and a nice way to get to know our members and projects in a fun and relaxed atmosphere.

When: Thursday, November 5, 6-10 p.m.

Where: Translations Gallery,
1743 Wazee Street, Denver

Cost: \$40 (cash or check paid at the door)

Proceeds from the event will go towards our three international projects in Ecuador, Togo, and Madagascar

Please RSVP to or send any questions to Amy Hui (stanford_amy@yahoo.com). For more information on our chapter and our projects, you can check out our website at www.ewbdenver.org

NEW MEXICO CORNER

If you'd like to volunteer to speak at a future meeting or if you have any meeting/activity ideas, please let me know!

Patrick Burton, New Mexico Liaison
pburton@unm.edu

Left: Golden Orb Weaving Spider,
Nephilia clavipes

AIChE Advertisers and Supporters

Consulting Engineers and Scientists

- Environmental Engineering / Consulting
- Site Remediation
- Vapor Intrusion Assessment / Mitigation

Erler & Kalinowski, Inc.

Centennial, Colorado

Contact: *Mike Moes, P.E., (303) 796-0535*

mmoes@ekiconsult.com

Support AIChE Rocky Mountain Section !!

YOUR BUSINESS INFORMATION OR
ADVERTISEMENT HERE!!



THOMAS A. WELLBORN

Bus: 303.933.0533

Fax: 720.981.9080

Cell: 303.810.3100

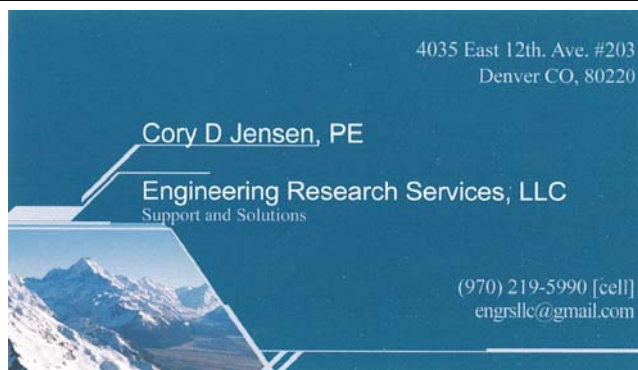
Res. 303.948.3045

2 Mountain Cedar Lane

Littleton, Colorado 80127-2601

TWellborn@astraenergy.net

YOUR BUSINESS INFORMATION OR
ADVERTISEMENT HERE!!



4035 East 12th. Ave. #203
Denver CO, 80220

Cory D Jensen, PE

Engineering Research Services, LLC
Support and Solutions

(970) 219-5990 [cell]
engrslc@gmail.com

YOUR BUSINESS INFORMATION OR
ADVERTISEMENT HERE!!



Michael Mutnan, P.E.

Principal

7248 Deframe Court
Arvada, CO 80005

Phone: 303-423-1586

Cell: 303-378-1296

E-mail: mjmmanage@msn.com



YOUR BUSINESS INFORMATION OR
ADVERTISEMENT HERE!!

For info: lauramoes@msn.com [Listing Rate: \$30/month; \$200/year (8 issues); Circulation: 750+]

Thank you for supporting AIChE Rocky Mountain Section!

AIChE Meetings

2009

- Nov 8-13 Annual Meeting
Nashville, TN
- Nov 17 AIChE Day at the
Chem Show
New York, NY
- Mar 21-25 2010 Spring Nat'l
Tampa, FL
San Antonio, TX
- May 2-5 SBE's 2nd Annual
Conference on Stem
Cell Engineering
Boston, MA
- June 27-30 AIChE's 2010
Process Develop,
Symposium: Energy
Challenges for
Process Developmt.
Lake Ozark, MO
- Oct 17-22 Annual Meeting
Salt Lake City, UT

For further information, contact
National AIChE.

National AIChE Contact Info

AIChExpress Service Center:
(US/Canada): 1-800-AIChemE
(1-800-242-4363)
(International): 203/702-7660
Fax: 203/775-5177
E-mail: xpress@aiche.org

Member Services: 800.242.4363
Career Services: 646.495.1330
Awards & Honors: 646.495.1317

Address: 3 Park Avenue
New York, NY 10016-5991

Web Page: <http://www.aiche.org>

Rocky Mountain AIChE Officers

Tom Wellborn	Director / Treasurer	303/933-0533 twellborn@astraenergy.net
Craig Turchi	Chair	303/384-7565 craig_turchi@nrel.gov
Martin Vorum	Vice-Chair / Program	303/384-7414 Martin_Vorum@nrel.gov
Kevin Milliman	Secretary	303/704-7530 Kmilliman@evgenergy.com
Dan LaRiviere	Website Administrator	303/462-7350 daniel.lariviere@jacobs.com
Glenn Sprenger	Membership	303/226-1731 grs@geosynfuels.com
Mike Moes	Communication	303/796-0535 mmoes@ekiconsult.com
Patrick Burton	New Mexico Liaison	pburton@unm.edu
Dr. Patrick Johnson	Wyoming/SD Liaison	pjohns27@uwoyo.edu
Laura Moes	Editor	303/770-2432 Lauramoes@msn.com

Rocky Mountain AIChE News is published eight times a year by the Rocky Mountain section of AIChE. Opinions expressed herein are those of the authors and are not necessarily those of AIChE nor the officers of this section.

The objectives of AIChE are to advance chemical engineering in theory and practice, to maintain a high professional standard among its members, and to serve society, particularly where chemical, engineering can contribute to the public interest.

Rocky Mountain AIChE News Publication Schedule

November 2009 issue

Articles due Wednesday, November 4th
Publish on Friday, November 6th
Meeting on Tuesday, November 17th

MEETING SCHEDULE

The Rocky Mountain District of AIChE generally meets the third Tuesday of every month, September through November and January through May.

Rocky Mountain AIChE News
America Institute of Chemical Engineers
7900 S. Monaco Ct.
Centennial, CO 80112-1326

On the Web at:

<http://www.aiche.org/rockymtn>

*Send your E-MAIL address to
mмоes@ekiconsult.com to receive
this newsletter electronically!*



Directions: Take I-25 North crossing into Wyoming. Merge onto I-80 West via Exit 8B toward Laramie. Take exit 313 onto South 3rd Street (US 287) driving north. Turn right onto East Lewis Street. Engineering Building is between 11th & 12th on the south side of the street. Free street parking after 5 p.m. on Bradley or Lewis Street.