



NEWSLETTER

Oklahoma Section American Chemical Society

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Alterations in Lipid Metabolism: Magnetic Resonance Investigations in Rodent Carcinogenesis Models

Thursday – February 23, 2005
OU Health Sciences
Faculty house
601 N.E 14th Street
Oklahoma City OK

Dr. Rheal A. Towner Ph.D

Associate Professor
Department of Pathology & Pharmaceutical Sciences
Oklahoma Medical Research Foundation
825 N.E. 13th Street
Oklahoma City OK 73104

C urrent studies in Dr. Towner's laboratory focus on the use of localized MRI techniques that can be used to assess phospholipid metabolism and fatty acid desaturation processes, as well as tumor antigen expression, as they are related to developmental stages of carcinogenesis in rodent hepatocarcinogenesis and glioma models. We have recently found that stearyl-CoA desaturase 1 [*Scd1*] and Δ^6 -desaturase, both involved in the desaturation of fatty acids in phospholipid metabolism, are found to be decreased in expression during rat liver tumor formation [choline-deficient hepatocarcinogenesis model], and that these alterations in fatty acid and phospholipid metabolism can be detected in rat liver extracts. For MRS evaluation high resolution 2D NMR methods are being developed for *in vivo* applications. Molecular evaluations [Northern and Western blots] of enzymatic events associated with phospholipid and fatty acid metabolic processes are correlated with MRS data. For tumor antigenic expression studies, MRI molecular targeting probes are being designed for *in vivo* detection, and correlated with standard immunohistological studies.

[Reservation Information on Page 2]

Schedule:

**6:00 PM Social Hour: OU Health Sciences
Faculty House**

**7:00 PM Dinner: OU Health Sciences
Faculty House**

8:00 PM Speaker: Dr. Rheal A. Towner.

Menu: **Dinner:** [1] Roast beef with Cabernet Sauce; [2] Herb Baked Chicken; Fresh Vegetables; Potatoes; Broccoli Madelene Salad; Fruit Salad; Cheese Tortellini Salad; Cheesecake with Strawberries; Chocolate Torte Cake; Iced Tea; Coffee; Water.

Cost: \$20.00-ACS Member; \$10.00-ACS Student Affiliate.

Deadline: Friday, 17 February, 2006; 4:30 p.m. Charles Rice: 405.325.5831 rice@ou.edu

Dr. Rheal A. Towner, Ph.D.

Education:

B.Sc., University of Guelph, Ontario, Canada, 1982

M.Sc., University of Guelph, Ontario, Canada, 1985

Ph.D., University of Guelph, Ontario, Canada, 1989

Research Interests

Current research interests focus on the investigation of in vivo metabolic tissue indicators and/or molecular targets that can be used to predict and understand malignant tumor development, as well as tissue injury processes resulting from natural toxin exposure from food or water contamination, such as the mycotoxins including aflatoxins or cyanobacteria toxins [e.g. microcystins and nodularin]. With the use of in vivo magnetic resonance imaging [MRI] techniques, including image-guided magnetic resonance spectroscopy [MRS] or chemical-shift imaging [CSI], localized metabolic changes and/or alterations in molecular targets (e.g. antigens, receptors, etc.) associated with tumor development during various stages of carcinogenesis, or acute toxicity responses from many toxicological agents, can be measured. The ultimate aims are to be able to use MRI and MRS techniques as clinical diagnostic tools for in vivo tumor grading, and to predict the extent of tissue injury from toxicological exposure.

In addition, spin-trapping electron spin resonance [ESR] spectroscopy has also been applied to monitor in vivo free radical formation resulting from toxicological exposure. In our understanding of in vivo metabolic processes that occur during carcinogenesis and toxin-induced tissue injury with the use of magnetic resonance techniques, it is anticipated that the same techniques can also be used to develop and assess therapeutic interventions and study their efficacy in vivo.

Dr. Towner is an Associate Member of the Free Radical Biology Research Program at OMRF, and holds adjunct Associate Professor positions in Pathology and Pharmaceutical Sciences at The University of Oklahoma Health Sciences Center [OUHSC]. Dr. Towner is also Director of the OMRF Small Animal Magnetic Resonance Imaging [MRI] Core Facility.

2006 Oklahoma Section Chair

Charles V. Rice - is an Assistant Professor in the Department of Chemistry and Biochemistry at the University of Oklahoma. He joined the department in 2002 after a two-year post-doctoral position at Washington University in St Louis with Professor Jacob Schaefer. He received his B.S. and M.S. [physical chemistry] degrees from Illinois State University and his Ph.D. in physical chemistry from Purdue University. He has eight publications to date and has been the recipient of the OU ACS Student Affiliate Most Creative Professor Award 2002-2004 and the Robert Duty Service Award in 1995 at Illinois State. He joined the ACS in 1990 as a student affiliate and has been a regular member since 2000.

New Student Awards

The Oklahoma Section recently created two new awards for undergraduate students. The **Terrill Smith Travel Award** is designed for undergraduates to travel to a regional or national ACS meeting to present a paper or poster. Two awards of up to \$600 will be awarded each year, one for fall travel and one for spring travel. **This award is named in honor of Dr. Terrill [Terry] Smith**, longtime Oklahoma Section officer and councilor, who retired from UCO in 1999. Terry was a strong supporter of undergraduate research and student affiliates at UCO and in the section.

The **Roger Baldwin Graduate School Award** is designed for undergraduate students who have been accepted to attend graduate school in the chemical sciences. One award of \$500 will be presented each spring. **This award is named in honor of Dr. Roger Baldwin**, another longtime Oklahoma Section officer who is retired from Kerr McGee Corporation. The section is able to offer these new awards partially due to Roger's persistent fund-raising efforts associated with the Southwest Regional Meeting in 2003.

Applications for both awards are available from Section officers or on our website, <http://membership.acs.org/O/Oklahoma/Index.htm>. For **more information** about these awards, **contact Gordon Eggleton**, geggleton@sosu.edu.

Oklahoma Section Website:

Dr. James J. Dechter – is the Section webmaster. Jim graciously “consented” to be the Section webmaster. Jim is Professor of Chemistry at the University of Central Oklahoma. Jim served as UCO Chemistry Department Chair from 2000-2004. Jim was also Section Chair in 2001.

If any Section member has any information to be posted on the website, contact Jim. 405.974.5435. e-mail: jdechter@ucok.edu

The Oklahoma Section website address: <http://membership.acs.org/O/Oklahoma/Index.htm>.

Thanks To:

Valerie Ferguson is the immediate past-chair Oklahoma Section ACS. Valerie is a Chemistry Teacher and Head of the Science Department at Moore High School. She has also been involved for many years with the Section's National Chemistry Week activities. It is largely through Valerie's dedication and hard work in the initial years that the Section's National Chemistry Week has become one of the Section's outstanding yearly activities. It then evolved into The Omniplex format of the past years. Valerie served as the Section Chair some four years ago. Her quiet and low key approach to Section duties belied her ability to get whatever job needed to be done. Valerie's enthusiasm & dedication served the Section well during her tenure. **Thank you Valerie for a job well done** as 2005 Chair of the Oklahoma Section ACS.

2006 Pentasectional Meeting



Northeast Oklahoma Section Of American Chemical Society

51st [2006] Pentasectional Meeting

The Northeast Oklahoma Section would like to announce plans to host the 51st Pentasectional Meeting of the American Chemical Society's Oklahoma Sections

Date: April 1, 2006

**Location: ConocoPhillips Bartlesville Technology Center
Bartlesville, OK**

Contact: Dan O'Donnell: acs5sections@cablone.net
Chad Brown: brownch@cpchem.com
<http://membership.acs.org/N/NEOklahoma/>

Ethanol industry surpasses key production goal

The U.S. ethanol industry has already surpassed the first-year goal of the renewable fuels standard [RFS] included in the recently enacted energy bill. According to data released by the Energy Information Administration, ethanol production in the U.S. averaged 261,000 barrels per day in September, which amounts to just over 4 billion gal on an annual basis. Ethanol production was up 1,000 bbl per day over August, and up 35,000 bbl per day over September 2004. "With more than a billion gallons of production capacity currently in construction, the U.S. ethanol industry will very soon become the world's leading producer of renewable fuels," says Robert Dinneen, president of the Renewable Fuels Association. Currently, 93 ethanol plants in 20 states have a combined production capacity of about 4.2 billion gal a year. There are 23 ethanol plants and seven expansions under construction, with a combined annual capacity of more than 1 billion gal. Under the Energy Policy Act of 2005, the oil industry is required to blend 7.5 billion gal of ethanol and other renewable fuels into gasoline by 2012.

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Ford Introduces Flex Fuel F-150

F-150 models equipped with the 5.4L SOHC Triton™ V-8 engine now offer the flexible fuel option at no charge. This stand-alone option means F-150 will be capable of running on renewable ethanol E85 fuel.

E85 is a blend of 85 % ethanol and 15% unleaded gasoline. The terms E85 vehicles and flexible fuel vehicles are interchangeable.

The Flex Fuel engine can operate on 100 % gasoline, E85 or any combination of the two fuels without changing horsepower and torque numbers,

Ford Motor is partnering with VeraSun Energy, the nation's second largest ethanol producer, to increase the number of fuel stations offering E85.

Visit www.eere.energy.gov/afdc/infrastructure/locator/html to find E85 stations in your area.

New 2006 Tax Incentives for Hybrid Vehicles

Thanks to a new Energy Bill taking effect on January 1, 2006, even larger income tax incentives are in place for hybrid vehicles purchased after January 1.

The new rules allow a \$400-to-\$500 tax credit, depending on the model. Tax credits are better than deductions because a credit directly reduces the amount of tax owed, as opposed to reducing taxable income as a deduction does.

The tax credit is a combination of how much fuel the vehicle saves over 120,000 miles and its fuel economy expressed by a percentage of the 2002 model year fuel economy for its weight class. The better a hybrid vehicle does in these computations, the larger the tax credit.

For more information on hybrid tax credit: http://www.fueleconomy.gov/feg/tax_hybrid.shtml

Cooking With Gas – Marc Reisch [Last 2 paragraphs of the article]

“Fuel cells similar to those at the Freeport site powered the GM HydroGen.3 minivans that visitors had an opportunity to drive. According to a GM spokesman, the prototype cost \$1 million to build and has a driving range of about 150 miles on the compressed hydrogen.”

“The minivan operated much like a normal vehicle, but because of its cost, limited range, and the lack of an infrastructure to safely distribute hydrogen, the GM representative admitted that such vehicles were not yet ready for “prime time”. So for the near future, a hydrogen economy is unlikely, but hydrogen-improved petroleum-derived fuels are here.”

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Oklahoma Section 2006 Meeting Schedule

March:

Date: TBA
Location: OU
Speaker: TBA

April:

Date: Friday 21st or Friday 28th - TBD
Location: TBA
Speaker: TBA

May:

Date: Monday, May 15, 2006. [Olympiad Awardees Honored]
Location: TBA
Speaker: TBA

September:

OBU at Shawnee [Annual Family Meeting]
Speaker: Probably Sherry Marshall from The Omniplex
Date: TBA

October:

Date: TBA
Speaker: TBA
Location: TBA

November:

Date: TBA [Usually Honor Section 50 Year Members]
Speaker: Chemist of the Year-Neil Purdie
Location: OSU

February 2006 Section Meeting

Thursday 23 February, 2006

**OU Health Sciences
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Speaker: Dr. Rheal A. Towner - OMRF

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