



# NEWSLETTER

## Oklahoma Section American Chemical Society

Volume 13 Number 7

November 1, 2007

### Multidimensional Separation Platforms for Proteomics.

**Thursday – 01 November , 2007  
Room 103 Physical Sciences  
Oklahoma State University  
Stillwater OK 74078**

***Dr. Ziad El Rassi*  
Chemist of The Year 2007  
Department of Chemistry  
Oklahoma State University  
Stillwater OK 74078**

In this talk, capillary and microcolumn-based platforms for the simultaneous depletion and concentration of proteins, tryptic digestion and proteomics profiling will be presented. In one capillary-based platform, an on-line coupling of capillary isoelectric focusing [CIEF] to capillary electrochromatography [CEC] was developed *via* a nano-injector valve for performing two-dimensional [2D] proteomics separation. CIEF constitutes the first separation dimension while CEC operates as the second separation dimension. Besides the orthogonal migration mechanisms of the two capillary-based separation modes, which lead to a 2D system whose overall peak capacity is the product of the peak capacity of the individual modes, the solvent of the CIEF mode is a weak eluent for the reversed-phase CEC [RP-CEC] mode, thus allowing the transferring of focused fractions from CIEF to CEC without inducing band broadening, and instead zone sharpening would result. The 2D platform described here offers the convenience to generate the needed peak capacity to solve a given proteomic separation problem.

In another microcolumn-based platform, affinity monolithic microcolumns with immobilized affinity ligands including protein A, protein G' and polyclonal antibodies were developed for the microscale

**[Continued Page 3]**

**[Reservation Information on Page 2]**

Schedule:

**5:00 – 7:00 PM Dinner: The Hideaway Pizza in Stillwater.**

**8:00 PM**

**Speaker:** Physical Sciences 103 [Tentative]. Room number & building will be announced at the Hideaway Pizza eatery. Or else check the web site for this information.

**Menu:** One topping pizza, salad and drink; all you can eat. Alternatively, individuals can order off the menu [for items such as pasta] if the buffet is not to your liking. Alcoholic drinks can also be obtained through individual purchases.

**Cost:** \$7.75 / person from the regular buffet. Alternatively, a person can individually order from the regular Hideaway Pizza menu for the stated price on the menu.

**Deadline:** For more detailed information, please contact Barry Lavine: 405.744.5945  
[bklab@chem.okstate.edu](mailto:bklab@chem.okstate.edu)

## Dr. Ziad El Rassi

**Professor Ziad El Rassi** was born in Lebanon and received his early education in the school system of Lebanon. The B.S. degree in chemistry was earned at the Lebanese University, Beirut, in 1972, followed by an Education Degree at the same University in 1973. He matriculated to Claude-Bernard University in Lyon, France, for M.S. and Ph.D. degrees in analytical chemistry in 1974 and 1978, respectively. A visiting Assistant Professorship followed at Ecole Centrale de Lyon [Engineering School], France [1978-1980]. He then joined the Chemical Engineering Department at Yale University, New Haven, CT, as an Associate Research Scientist (1980-1985) and was appointed to Research Scientist over the period of 1985-1988. An Assistant Professorship was accepted in 1988 at Oklahoma State University (OSU) in the Department of Chemistry. He rose through the ranks to become Full professor in 1998.

During his tenure at OSU, he has directed the research of 7 undergraduates, 10 M.S. students, 12 Ph.D. students and 4 Postdoctoral fellows. The work has resulted in 164 papers in peer-reviewed journals and 162 presentations including 112 invited lectures at various locations around the world.

He is a permanent member of the Frederick Conference on Capillary Electrophoresis, the Asia Pacific International Symposium on Microscale Separations, and the International Symposium on Capillary Electro-separation Techniques.

Because of the quality of his research, he was appointed Associate Editor of the journal ELECTROPHORESIS in 1993 and became the Editor-In-Chief of the Journal in 2005. He has been on the Editorial Boards of many Journals and has edited 4 books two on carbohydrate analysis by chromatography and electrophoresis and two on capillary electrophoresis and electrochromatography.

Prof. El Rassi has received the Sigma Xi Lectureship Award in 2004, the Regents Distinguished Research Award in 2005, the Oklahoma Scientist of the Year Award in 2006, and the Oklahoma Chemist of the Year Award in 2007. . . . .



**[Continued from Page 1]**

depletion of the top 8 most abundant proteins in human serum. The various affinity microcolumns were evaluated for their sample loading capacities with the standard protein substrates. In general, the sample loading capacity of protein A and protein G' was about 7 to 25 fold higher than that of the antibody-based affinity columns. The macroporous nature of the monolithic columns, which offers high permeability in pressure driven flow, allowed the design of long tandem affinity columns for the simultaneous depletion of the top 8 most abundant proteins in a single run. The tandem format could be extended to include additional affinity monolithic columns to deplete other proteins for which specific antibodies are available without running into high inlet pressure.

**Cheryl Frech - Section Councilor:**

Several items from the Boston national meeting are posted for your feedback on our local Section website. You can read the proposed student membership change and the academic professional code of contact draft and send your comments to the Oklahoma Section councilor at <http://membership.acs.org/O/Oklahoma/Index.htm> .

**Continuing the Green Revolution by Norman E. Borlaug**

**[This article appeared July 18, 2007 in the WSJ on the Editorial page.]**

**5 selected excerpts from the article follow:**

Since 1996, the planting of genetically modified crops developed through biotechnology has spread to about 250 million acres from about 5 million acres around the world, with half of that area in Latin America and Asia. This has increased global farm income by \$27 billion annually.

Ag biotechnology has reduced pesticide applications by nearly 500 million pounds since 1996. In each of the last six years, bio tech cotton saved U.S. farmers from using 93 million gallons of water in water-scarce areas, 2.4 million gallons of fuel, and 41,000 person-days to apply pesticides they formerly used.

Herbicide-tolerant corn and soybeans have enabled greater adoption of minimum-tillage practices. No-till farming has increased 35% in the U.S. since 1996, saving millions of gallons of fuel, perhaps one billion tons of soil each year from running into waterways, and significantly improving moisture conservation as well.

Improvements in crop yields and processing through biotechnology can accelerate the availability of biofuels. While the current emphasis is on using corn and soybeans to produce ethanol, the long-term solution will be cellulosic ethanol made from forest industry by-products and products.

Finally, I should point out that there is nothing magic in an improved variety alone. Unless that variety is nourished with fertilizers – chemical or organic – and grown with good crop management, it will not achieve much of its genetic potential.

**Mr. Borlaug, the 1970 Nobel Peace Prize Laureate, was awarded the Congressional Gold Medal, America's highest civilian honor on July 17, 2007 at a White House ceremony.**

You might wish to read the posted article by Gregg Easterbrook. He refers to Borlaug as “*The Greatest Living American Ignored* - - -”. Although cameras were allowed at the presentation, Easterbrook noted there were none from the major networks. But the international press segment cameras were well represented.

[www.huffingtonpost.com/gregg-easterbrook/greatest-living-american-b-56665.html](http://www.huffingtonpost.com/gregg-easterbrook/greatest-living-american-b-56665.html)

#### **Coca-Cola To Build PET Recycling Plant\*\***

Coca-Cola will spend more than \$60 million on recycling efforts that include what it claims will be the world’s largest polyethylene terephthalate bottle recycling plant. The beverage firm will build the plant in Spartanburg, S.C., by 2008 with partner United Resource Recovery. The facility will recycle 100 million lb of PET per year—enough to make 2 billion 20-oz bottles—using a United process that “chemically super-cleans” PET flake. To further its goal of recycling 100% of its U.S. PET bottles, Coke also plans to establish recycling centers throughout the U.S. and invest in Recycle Bank, a curbside collection and recycling organization.

**\*\* Reprinted from C&E News, September 10, 2007, Page 21**

#### **Climate Change/Global Warming**

For a different perspective vs the presently favored CO<sub>2</sub> greenhouse gas cause, you might wish to read the following article.

##### **Celestial Climate Driver: A Perspective from Four Billion Years of the Carbon Cycle.**

Jân Veizer Ottawa-Carleton Geoscience Center, University of Ottawa, Ottawa K1N 6N5 Canada  
Geoscience Canada Volume 32 Number 1 March 2005.

[findarticles.com/p/articles/mi\\_m0QQS/is\\_1\\_32/ai\\_n13670777-33k](http://findarticles.com/p/articles/mi_m0QQS/is_1_32/ai_n13670777-33k)

#### **A Burning Questions For Brazil’s Sugar\*\***

##### **Should Farmers Still Use Fire to Help in Harvest, Or bring in Machines?**

**By Kenneth Rapoza**

**\*\* This article appeared in the Monday September 24, 2007 Edition of The Wall Street Journal in the “Moving The Market” section, page C3.**

Some selected excerpts follow:

Each September, thousands of acres of Brazilian sugarcane go up in smoke, a ritual that accentuates an economic, social and environmental conflict.

Farmers burn the crop to facilitate harvesting by machete. The government wants to end the practice, long considered a health hazard and one of Brazil’s top greenhouse-gas contributors. If the practice is banned, mechanical harvesters will take over taking thousands of poor workers out of the field and likely leading to a social conflict that city councilors and labor unions would rather avoid.

São Paulo is the heart of Brazil’s cane country and Brazil is the world’s leading sugarcane producer and exporter. Add sugarcane-ethanol production to the mix, of which Brazil is also the world’s leader, and

the tall green crop has become one of the most important, if not controversial crops growing in Brazil these days.

Burning the cane eliminates the razor-sharp leaves from the cane stalks, making it easier to cut by hand. Yet, cane-burning practices pump a layer of black ash into the air, creating an eye-burning pollution. Machines don't require burning.

The sky over Ribeirão Preto in the interior of São Paulo state is a light tan, creating air quality nearly as poor as it is in São Paulo, the nation's largest city.

"If you drive through these towns at this time of the year, you are faced with a layer of pollution and smoke that creates respiratory problems and the government is aware of that, as much as it is aware of the labor side of this." Said Sérgio Torkuato, a researcher at the Agriculture Economy Institute in São Paulo.

For every harvest combine used to cut down the cane stalks, 180 men are taken out of the fields, estimated Mr. Zanetti, the sugar-company executive.

Brazil's sugarcane industry is facing its own set of growing pains. Falling sugar and ethanol prices are squeezing company profit margins following a year of heavy investments. World raw sugar prices at the ICE Futures U.S. fell 0.05 cents Friday to 9.79 cent a pound for the October contracts.

#### **Composites Note:**

Airbus has switched the composition of the A350XWB airliner fuselage from composite panels on an aluminum frame to all-composite following Boeings' lead on the 787 Dreamliner. Industry executives have advised Airbus that it must embrace composites or be left behind. Dreamliner fuselages are constructed by Japanese, U.S., and Italian firms that specialize in composite structures. The technology will loom large in aircraft that will replace the Boeing 737 and 777.

#### **OECD Questions BIOFUEL Expansion\*\*\***

Strong fears that an international "rush to energy crops" to reduce CO<sub>2</sub> emission and petroleum consumption will result in global food shortages in the near future were voiced in a recent report prepared by a panel of the Organization for Economic Cooperation & Development. "When acidification, fertilizer use, biodiversity loss, and toxicity of agricultural pesticides are taken into account, the overall environmental impacts of ethanol and biodiesel can very easily exceed those of petrol and mineral diesel," says the report. The report's authors argue that only sugarcane to-ethanol production in Brazil, cellulosic ethanol made in Sweden, and Switzerland, and biodiesel production from animal fat or used cooking oil can substantially reduce CO<sub>2</sub> emissions, compared with gasoline. Other biofuel feedstocks, which compete with food uses, deliver greenhouse gas emission reductions of less than 40%, compared with gasoline and other fossil fuels, the report says. Among its recommendations, the report urges countries to end mandates for biofuel production, as the U.S. does, and replace them with technologically neutral policies, such as carbon taxes that may stimulate energy efficiency and a broad range of approaches to reduce CO<sub>2</sub> emissions. The report is available at [www.oecd.org/dataoecd/40/25/39266869.pdf](http://www.oecd.org/dataoecd/40/25/39266869.pdf)

**\*\* Reprinted from C&E News, September 17, 2007, Page 27**

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**The reprinted letters and articles as well as the editor's unsigned article[s] in this Newsletter do not necessarily reflect the views of the Oklahoma Section of the ACS.**

**November 2007 Section Meeting**

**Thursday, 01 November, 2007**

**Oklahoma State University**

*Multidimensional Separation Platforms for Proteomics.*



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