



# TRIAD CHEMICAL TIMES

Central North Carolina Section American Chemical Society

**November CNC-ACS Meeting**  
**Dr. Dickson Wambua**  
**Thursday - November 29 - Syngenta**



## Mass Spectrometric (MS) Measurements of miRNAs

### November Meeting:

**When:**

Thursday Nov 29, 2012

**Where:**

Syngenta - Greensboro  
Auditorium

**Time:**

6:30 pm Hospitality

7:00 pm Presentation

Details: page 3

Directions: page 4

### December Meeting:

**When:**

Thursday Dec 6, 2012

**Where:**

Hawthorne Inn - Winston-Salem

**Time:**

7:00 -7:45 pm (social)

7:45 pm (dinner)

9:30 -11:00 pm (social-continued)

Details: page 4

Directions: page 4

### Inside this issue:

CNC Exec. Committee 2

November Meeting 3

Directions 4

## CNC-ACS Officers

Dr. Ed Robinson	Chair	<a href="mailto:erobinson@lortobco.com">erobinson@lortobco.com</a>
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CNC-ACS Website <http://www.cnc-acs.sites.acs.org/>



## 2012 Executive Committee

Office	Officer	E-mail	Phone
Chair	Edward Robinson	<a href="mailto:erobinson@lortobco.com">erobinson@lortobco.com</a>	335-6625
Chair Elect	Cliff Bell	<a href="mailto:bellce@wssu.edu">bellce@wssu.edu</a>	750-2545
Secretary/Treasurer	Janice Foushee	<a href="mailto:jfoushee@ashland.com">jfoushee@ashland.com</a>	333-2738
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Councilor ('12)	Tim Ballard	<a href="mailto:tballard@en-cas.com">tballard@en-cas.com</a>	785-3252
Alternate Councilor ('12)	Paul Weller	<a href="mailto:wellerp@elon.edu">wellerp@elon.edu</a>	278-6225
Alternate Councilor ('12)	Gail Webster	<a href="mailto:gwebster@guilford.edu">gwebster@guilford.edu</a>	316-2486
Director ('13)	Kent Kabler	<a href="mailto:kent.kabler@syngenta.com">kent.kabler@syngenta.com</a>	632-6014
Director ('14)	TJ Mayer	<a href="mailto:tj.mayer@syngenta.com">tj.mayer@syngenta.com</a>	632-6079
Past Chair	Bill Eberle	<a href="mailto:bill.eberle@syngenta.com">bill.eberle@syngenta.com</a>	632-7569
Analytical Sub Group	Jeremi Johnson	<a href="mailto:JeremiJohnson@lortobco.com">JeremiJohnson@lortobco.com</a>	335-6624
Awards	Robert Yokley	<a href="mailto:TR6VOL@triad.rr.com">TR6VOL@triad.rr.com</a>	595-7530
Education	Yulia Basova	<a href="mailto:ybasova@yahoo.com">ybasova@yahoo.com</a>	834-2335
* Chemsense	OPEN		
* National Chemistry Olympiad	Janis McDonald	<a href="mailto:mcdonaj2@gcsnc.com">mcdonaj2@gcsnc.com</a>	819-2970
* Science Center Advisor	Jerry Walsh	<a href="mailto:jwalsh@uncg.edu">jwalsh@uncg.edu</a>	334-5672
* UNC-G High School Lab Day	Jerry Walsh	<a href="mailto:jwalsh@uncg.edu">jwalsh@uncg.edu</a>	334-5672
Earth Day	Bill Nell	<a href="mailto:williamnell@bellsouth.net">williamnell@bellsouth.net</a>	764-9322
Government Relations	Edward Robinson	<a href="mailto:erobinson@lortobco.com">erobinson@lortobco.com</a>	335-6625
Hospitality	Pat Duffy	<a href="mailto:duffypatriciaj@gmail.com">duffypatriciaj@gmail.com</a>	209-0302
Long Range Planning	Dave MacInnes		254-8453
Membership	OPEN		
Minority Affairs	Julius Harp	<a href="mailto:harpj@ncat.edu">harpj@ncat.edu</a>	285-2239
National Chemistry Week	Dennis Ergle	<a href="mailto:dergle@lortobco.com">dergle@lortobco.com</a>	335-6629
	Cynthia Willard	<a href="mailto:cwillard@lortobco.com">cwillard@lortobco.com</a>	335-6729
Newsletter Editor	TJ Mayer	<a href="mailto:tj.mayer@syngenta.com">tj.mayer@syngenta.com</a>	632-6079
Poster Vendor Night			
* Vendor Coordinator	Kent Kabler	<a href="mailto:kent.kabler@syngenta.com">kent.kabler@syngenta.com</a>	632-6014
* Poster Coordiniator	Jill Tierney	<a href="mailto:tierney@ppg.com">tierney@ppg.com</a>	856-5632
Project Seed	OPEN		
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Public Affairs	Edward Robinson	<a href="mailto:erobinson@lortobco.com">erobinson@lortobco.com</a>	335-6625
* Science Advisor - Howard Co-	Dave MacInnes		
* Science Advisor - Richard Burr	Liliana Garcia	<a href="mailto:lilianagarcia@live.com">lilianagarcia@live.com</a>	
Student Member Coordinator	Bethany Eaton	<a href="mailto:bethany.eaton@salem.edu">bethany.eaton@salem.edu</a>	366-7596
Student Member Faculty Coord.	Paul Weller	<a href="mailto:wellerp@elon.edu">wellerp@elon.edu</a>	278-6225
Web Page	John Merle	<a href="mailto:merlejo@wssu.edu">merlejo@wssu.edu</a>	750-2237
Womens Chemists	Gail Webster	<a href="mailto:gwebster@guilford.edu">gwebster@guilford.edu</a>	316-2486
Younger Chemists	OPEN		

## November Meeting Details

### Biography:

Dickson Wambua was born in Kenya and got his bachelor's degree in Chemistry from Moi University. He went on to work for several chemical companies in Kenya and later took up a job as a banker where he worked to evaluate business related scientific concepts and work flows from companies prior to awarding them loans. He moved to the United States for graduate school in 2007 and graduated from The University of North Carolina at Greensboro with a Master's of Science in Biochemistry in 2009 before joining the Ph.D. program there in Medicinal Biochemistry with a focus on Bioanalytical Chemistry. During his Master's and Ph.D. programs, he has developed, published and patented several highly accurate assays for the measurement of Alzheimer's and Cancer biological markers. Dickson defended his Ph.D. work last month and is currently interviewing for scientist positions.



1-Jiang, Q.; Wang, Y.; Hao, Y.; Juan, L.; Teng, M.; Zhang, X.; Li, M.; Wang, G.; Liu, Y., *Nucleic Acids Res* **2009**, *37* (Database issue), D98-104.

2-Griffiths-Jones, S.; Grocock, R.; van Dongen, S.; Bateman, A.; Enright, A., *Nucleic Acids Res* **2006**, *34* (Database issue), D140-4.

3-Wambua, D.; Bakhos, A.; Chiu, NHL.; Creating Mass Signatures for the Identification of microRNA Using Mass Spectrometry. *Analytical Methods*, **2012**, *4*, 3453-3459.

### Abstract:

MicroRNAs (miRNAs) play a crucial role in the post-transcriptional regulation of gene expression, and have already been associated with 160+ diseases<sup>1</sup>. With the small sizes of miRNAs (19–25 nt) and the increasing number of human miRNAs (>2000) being reported, the accurate detection of a specific miRNA has continued to be a challenging issue<sup>2</sup>. In this talk, a new concept for improving the accuracy of direct mass spectrometric (MS) measurements of miRNAs will be discussed. The concept aims at creating a unique signature in the mass spectrum of miRNA. To achieve this goal, one way is to capture a specific miRNA by using a complementary DNA probe. The miRNA is then eluted and digested with a specific endonuclease. The digested miRNA fragments are directly measured by using MS. Alternatively, a unique mass signature can be created by incorporating one or more extra nucleotides into the 3' end of miRNA and the extended miRNA is measured by using MS. The molecular mass of the extended miRNA, which is defined as an extended mass signature, is expected to be different from the other miRNAs within the same sample. In comparison to matching the measured molecular mass of an undigested or unextended miRNA molecule to the expected molecular mass, the two different approaches to create a unique mass signature can improve the accuracy on mass spectrometric detection of miRNA<sup>3</sup>.

## Meeting Directions:



### **Traveling West on I-40** in Greensboro:

- ✚ Take **Exit # 213**.
- ✚ At the top of the exit ramp, go straight through the traffic signal onto **Swing Road**.
- ✚ Follow Swing Rd past the Radisson and turn **left at the “Entrance 2” sign**.
- ✚ **Park in the parking area on the left**.
- ✚ Enter the glass double doors to the right of “E” Building. Check with security and they will direct you to the site auditorium or L-Bldg.

### **Traveling East on I-40** in Greensboro:

- ✚ Take **Exit # 213** and follow the exit ramp around to the top.
- ✚ Turn **right at the traffic signal** and pass over I-40.
- ✚ Turn **left** at the very **next traffic signal** onto Swing Road (immediately after crossing I-40).
- ✚ Follow the remainder of directions from the I-40 West directions above.

**Holiday Banquet at Hawthorne Inn - Dec 6, 2012**

Cost is \$15/member. Please RSVP Pat Duffy @ [duffypatriciaj@gmail.com](mailto:duffypatriciaj@gmail.com) by December 1 if you plan to attend.

### **Heading East from Asheville/Statesville/Hickory/Charlotte**

1. Head East on I-40, then continue East on Business 40 into downtown Winston-Salem.
2. Take the Cherry St. exit (5-C) onto High St. The front entrance of the hotel is immediately on your right.

### **Heading West from Raleigh/Greensboro/High Point/Virginia**

1. Take I-40 West, then take Business 40 split (exit 206) into downtown Winston-Salem.
2. Take the Cherry St. exit (5-C) onto Cherry St.
3. Turn left at the first traffic light onto First St.
4. Turn left at the next traffic light onto Marshall St.
5. Cross over Business 40 and through the next traffic light.
6. As you head downhill, the hotel's rear parking entrance will be on your right. Turn into the parking lot and drive around the building to the hotel's front entrance.