Revised: 02/10/06

BIOSCIENCE FOR LIFE:
Technology to Enhance Health, the Environment and Agriculture
Featuring Beltsville Agricultural Research Center (BARC)

Detailed Agenda

8: 00 am – 9:00 am **Registration, Continental Breakfast, and Networking**

9:00 am – 9: 30 am **Opening Remarks**

Julie Coons, President
Tech Council of Maryland (TCM)
Phyllis Johnson, Executive Director
Beltsville Agricultural Research Center (BARC)
Renee Winsky, Interim Executive Director
Maryland Technology Development Corporation (TEDCO)

9:30 am – 9:40 am **BARC Partnering Opportunities**

Harry Danforth
Technology Transfer Coordinator
USDA

9:40 am – 9:50 am **TEDCO Funding Opportunities**

Steve Fritz, Ph.D., Director of Technology Transfer
Maryland Technology Development Corporation (TEDCO)

9:50 am – 10:50 am **Session I:** Successful Partnerships with BARC

Featured Companies and Presenters

Robert Kozak, Founder
Atlantic Biomass Conversions, Inc.
(www.atlanticbiomass.com/index.html)

J.J. Lin, President and CEO
Imagilin Technology, LLC
(www.imagilin.com/index.html)

Michael Tiffany, Senior Plant Pathologist
AGDIA
(www.agdia.com/)

David Yoel

IntelliTech Microsystems Inc.
(www.IMicro.biz)

10:50 am – 11:10 am **Networking Break and Poster Sessions**

11:10 am – 11:50 am **Session II:** Partnering Opportunities Presentations

Advanced Nanostructured Proteins for Fuel Cells
Justin Barone

- Agriculture is the source of many proteins that could serve higher valued markets compared to food or feed.
- Proteins contain amino acids that can be made electrically conductive by complexation with the right elemental metals.
- Protein/metal complexes have the potential to be ionically selective membranes, making them possible candidates for fuel cells. Other applications could be membranes for separation of heavy metals from water or membranes for chemical reactions to produce new co-products.

Food Ingredients & Supplements: Value Added Plants and the Metabolic Fate of Anthocyanin Constituents
Janet Novotny

- Anthocyanins are red through blue plant pigments that act as phytonutrients with antioxidant activity.
- Since different anthocyanins have different metabolic fates, do certain anthocyanins in the diet produce more biologically active components?
- History of successful collaborative research between ARS plant scientists and nutritionists.

Development of Winterhazel as a New Woody Ornamental Landscape Plant for the Nursery Industry
Margaret Pooler

- The landscape industry is the fastest growing segment of US Agriculture. In the recent USDA Horticultural Census, nursery plants had a yearly wholesale value over $3 billion.
- Winterhazel is a flowering shrub that could be used as an alternative for forsythia. The U.S. National Arboretum has created hybrids between different winterhazel species that performed well in Washington, D.C.
- Commercial partners are needed to help test, produce, distribute, and market the new plants.

Imagine Strawberries Locally Grown All Year
Kimberly Lewers

- The largest market for fresh strawberry fruit is on the east coast, while 85% of the strawberries sold are grown in California. Year-round strawberry production is needed in proximity to the largest segment of strawberry consumers.
- Develop a combination of cultivars and production systems for year-round

production on the east coast.
- Repeat-fruiting cultivars combined with a suite of early-, mid-, and late-season June-bearing cultivars should allow nearly continuous strawberry fruit production in the field and in protected cultivation. Germplasm has already been developed for further testing and trialing.

Swine Targeted Functional Genomics-Based Models for Biomedical Research
Harry Dawson
- A resource for immunological, nutritional and physiologic evaluations.
- Unique molecular-biology based approaches to determine mechanism(s).
- Preclinical data generated in a large animal model.

11:50 am – 12:00 pm **Break**

12:00 pm – 1:10 pm **Lunch and Keynote Speaker from the Mars Corporation**
Roger Dehnel, Director of Cocoa Sustainability

1:10 pm – 1:45 pm **Session III:** Partnering Opportunities Presentations

Transgenic Control of Citrus Greening Disease
John Hartung
- Citrus greening disease will rapidly destroy the citrus industry in Florida ($10 billion) if not controlled.
- Transgenic approaches will be required to save the industry.
- We are using a citrus virus to deliver antibacterial peptides to specific citrus tissues and test for efficacy against the bacterial pathogen in citrus trees.

Animal Improvement through Genetic Engineering
David Donovan
- Certain lytic proteins from viruses that infect bacteria can degrade a specific cell wall component of bacteria, thus lysing and killing the bacteria when added exogenously.
- Multiple lytic domains in one of these proteins can target several sites in the cell wall simultaneously, resulting in no detectable resistance development by the bacteria.
- Fusions of the lytic domains of these proteins from different genera maintain their function and result in cross-genera antimicrobial activity.

Bacteriocins as Antibiotic Alternatives and a Means to Reduce Food Borne Pathogens On-the-Farm
Gregory R. Siragusa, Norman J. Stern and Bruce S. Seal Agricultural Research Service Russell Research Center, Athens, GA
- U.S. food animal industries are under increasing pressure to reduce/ withdraw non-therapeutic antibiotic growth promotants (AGPs). Withdrawing AGPs from poultry operations increases levels of disease.
- We have discovered and characterized candidate lytic proteins for use as non-

antibiotic antimicrobial agents in poultry when applied through either feed or water.

- In addition to reducing disease in poultry, this system can serve as a good model for combating other spore-forming agents such as *Bacillus* or *Clostridium*.

Novel Strategies for the Prevention and Treatment of Mastitis
Douglas Bannerman

- Mastitis is one of the most costly diseases to animal agriculture and is associated with annual economic losses of $2 billion in the U.S.
- Current antibiotic treatment for this disease remains suboptimal, and there is increasing consumer pressure to reduce the use of traditional antibiotics in food production animals.
- ARS scientists are developing novel methods for the prevention and treatment of this disease, including:
  - Developing immuno-modulators to enhance clearance of existing infections
  - Developing immuno-stimulatory molecules to prevent new infections.
  - Developing and evaluating a vaccine that can prevent mastitis.

1:45 pm – 3:10 pm Networking, Poster Sessions, and Optional "Partnering Possibilities" Facilities Tours
(Registration is required.)
**Attendees are also welcomed to visit the TEDCO BARC office for further information on TEDCO programs.*

POSTER SESSIONS

Creating giant soybean plants for biodiesel production
Thomas Devine

- Soybeans are fast growing and heat tolerant with broad national adaptability.
- High soybean yield plus biomass production without nitrogen fertilizer input.
- Harvests carbon credits.

Development and testing of a prototype portable near-infrared analyzer for manure nitrogen
James B. Reeves, III

- Rapid on-farm methods for determination of manure nutrients are needed in order to efficiently utilize manure and avoid excess nutrient application.
- Presently available methods for nitrogen (N) can only determine ammonium-N while organic-N can comprise 50% or more of the total N present.
- A prototype, portable, near-infrared spectrometer has been built which can accurately determine both organic- and inorganic-N in manures.

Prevalence and Diversity of Water-borne Pathogenic *E. coli*: Implications for Rapid Detection
Daniel Shelton

- Many immunological- and PCR-based methods have been developed for the rapid detection of pathogenic *E. coli.*
- The reliability of rapid detection methods is limited due to the widespread distribution of virulence factors among different bacteria and to inadequate sensitivity in the absence of concentration or enrichment.
- The development of improved methods of detection will greatly facilitate the analysis of water samples for contaminants.

Evaluating non-chemical alternatives to control fungal and bacterial plant pathogens
Dilip K. Lakshman

- We have demonstrated *in vitro* that an edible botanical extract (Be) was effective controlling bacterial plant pathogens. The same product was also reported to possess antifungal properties.
- Initial greenhouse studies showed the effectiveness of Be in controlling an important soilborne bacterial plant pathogen.
- Further testing is needed in order to develop a commercial disease control protocol.

A new antibiotic to control honey bee diseases
Mark Feldlaufer

Detection of and protection against *Cryptosporidium*, a pathogen affecting humans and food animals, using molecular methods
James Trout

- Novel detection methods.
- Recombinant proteins for passive immunization.

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For program information, contact Robbie Melton at rmelton@marylandtedco.org or 410-715-4164.