AEIC 2024 Fall Meeting Minutes

P.L. Hunst, AEIC Secretary

Hosted by Eurofins GeneScan, October 9-10, 2024

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AEIC Fall 2024 Meeting Minutes

October 9-10, 2024

New Orleans, LA

P.L. Hunst, Secretary

The AEIC Fall 2024 Meeting was held on October 9-10 in New Orleans and was hosted by Eurofins GeneScan. Tao Geng, AEIC Vice President, welcomed everyone to the meeting and presided over the attendee introductions following the antitrust reminder.

Frank Spiegelhalter, VP Eurofins GeneScan, gave an introduction on Eurofins. Eurofins has 55,000 employees, 900 labs spread over 50 countries and performs 450 million tests annually. Eurofins was started in France and does food/agricultural testing, environmental testing and medical testing. Food testing is done in microlabs in the US. These microlabs assess nutrition, contaminants, microbiology and specialty testing (GeneScan). GeneScan was started as an independent compay in 1999 and was then acquired in 2004. GeneScan performs 100,000 tests annually, mainly PCR and ELISA. Testing is done from GMOs, allergens, meat speciation, plant-based verification. Ag commodity testing for mycotoxins, pesticide residue, heavy metals is performed by a sister lab in New Orleans (lab tour given on October 10).

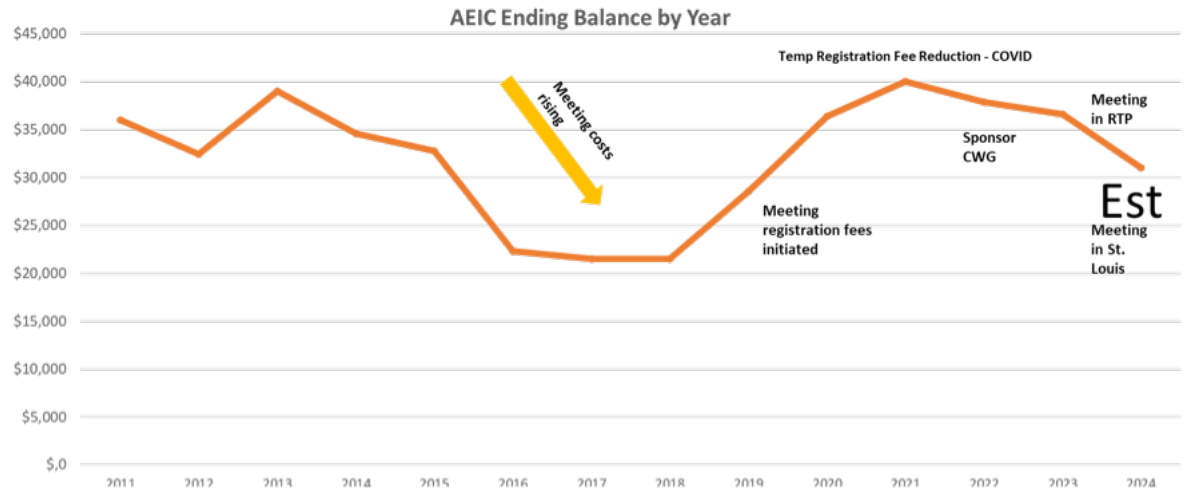
AEIC BUSINESS MEETING

Approval of 2024 Spring Meeting Minutes (P. Hunst): A motion was made and seconded to approve the minutes posted on the website. Motion was approved by member vote.

Treasurer Report (L. Muschinske): The Treasurer presented the 2024 budget YTD as follows:

AEIC 2024 Budget Summary			
	Planned	Actual	
Beginning Balance as of January 1, 2023	$ 37,415	$ 37,415	Account balance as of 1/3/2024
2024 Membership Dues Received	$ 13,100	$ 12,750	
Meeting registration fees - Spring Meeting	$ 5,500	$ 6,950	
Meeting registration fees - Fall Meeting	$ 4,000	$ 5,075	
Sponsorships	$ -	$ 6,000	$1500ea - Corteva, Bayer, BASF, Syngenta
Total Projected Revenue	$ 22,600	$ 30,775	Actual YTD Revenues
Expenditures			
Scientific Paper	$ 3,000	$ 3,750	Immunoassays and Mass Spectrometry for Determination of Protein Concentrations in Genetically Modified Crops — Journal of Agriculture and Food Chemistry
DE Franchise Tax Report - Report generation fees	$ 25	$ 25	
ANSI/ISO Initiative (AOCS - ISO TAG)	$ 2,900	$ 2,900	
Board Meeting Expenses	$ 700	$ 481	
Spring Meeting Expenses (including speaker travel allowance)	$ 12,000	$ 17,322	
Website hosting, maintenance, security	$ 700	$ 774	
Credit card processing and bank service charges	$ 500	$ 555	
Fall Meeting Expenses (including speaker travel allowance)	$ 8,000	$ 5,158	
Graphic design material creation	-	-	
Marketing	$ 300		
Subscriptions – conferences	-	-	
Miscellaneous	-	$ 6,000	Health and Environmental Sciences Institute
Total Projected Expenses	$ 28,125	$ 36,965	Actual YTD expenses
PROJECTED BALANCE	$ 31,890	$ 31,225	Current Balance

Ending Balance Trend (Short-term):



Membership Update (L. Muschinske): The following table depicts the current membership composition of AEIC:

AEIC 2024 Member Summary		Updated: 10/5/2024

		Potential Dues	Unpaid	Amount Unpaid
Large Corporate Members (1,000+ employees)	6	$ 6,000	0	$0
Medium Corporate Members (50 to <1000 employees)	10	$ 5,000	1	$500
Small Company Members (< 50 employees)	12	$ 3,000	0	$0
Associate Members	4	$ 200	0	$0
Individual Members	3	$ 300	0	$0
		$ (1,250)		
TOTAL	35	$ 13,250	1	$500

A correction was noted that there are 3 Associate members and 4 Individual members. Treasurer will correct.

Money was collected from BASF, Bayer, Corteva and Syngenta to support the HESI conference. The budget will be voted for approval at 2025 Spring Meeting since all 2024 expenses will be in.

Spring Meeting 2024: Eurofins FCT will host the Spring 2025 meeting in Madison,WI.

Suggested topics: AI—how it works (demonstration); Data driven systems; Digital/Precision agriculture; Use if AI in regulatory and regulatory science; Release of GM wheat; New analytical techniques(nanoparticles); Brainstorming sessions for Working Groups; Demonstration of Google share; Testing in hemp/Cannabis industry; GM bananas; GM eucalyptus; GM chestnut issues; GM petunias fiasco.

Fall Meeting 2025: The group is looking for a company host for this meeting.

AEIC Vice President Election: Nominations were received for Chris Ament (Eurofins FCT), Matt Cheever (BASF) and Farhad Gharvami (Eurofins BDI). The Secretary will confirm with nominees their desire to seek VP office. Election will start in later October via email.

Protein Working Group Updates (C. Ament/Eurofins): The Protein Working Group (PWG) is co-chaired by Chis Ament (Eurofins) and Mark Bednarcik (Syngenta) The PWG currently has 5 active work streams (Multiplex Validation, MS for Protein quantification, Allergen Analysis, Extraction Efficiency, Intractable Proteins/Characterization). The goal of the **Intractable Protein WS** is to review protein characterization, production and quantification methods and address technical challenges associated particularly with intractable proteins. Manuscript on the safety assessment for intractable proteins was published in Journal of Regulatory Science on Oct. 7 (Considerations for safety assessment of intractable proteins expressed in genetically modified crops (tdl.org). The **allergen analysis group** is working on a draft outline for a paper on Human Serum Screening in Allergenicity Assessment of GM Crops and use of weight of evidence approach before performing human serum screening. Group is also reviewing EFSA publication: Novel strategies for predicting allergenicity. Group is proposing allergenicity risk assessment parallel session at ISBR 2025. The **multiplex validation** is finalizing a first draft of a manuscript on guidelines. A more extensive review will be done in Q4. The **MS protein quantification group** has published their paper: https://pubs.acs.org/doi/epdf/10.1021/acs.jafc.3c09188. Group is currently working on a slide deck reviewing and summarizing techniques for detecting and measuring Ag Biotech Protein Products. The **extraction efficiency WS** is discussing methodologies for establishing extraction efficiency. The whitepaper was published on the AEIC website.

Composition Working Group (N. Gillikin, BASF): The group is working on ways to support acceptance of combustion (Dumas) vs the Kjeldahl method in the biotech industry for estimation of crude protein levels. The literature review is done. The CWG had collected samples for corn and soybean and had them analyzed by EPL and Eurofins. There was good agreement for the crude protein values for the corn samples by both methods. There was little agreement on crude protein for the soy samples using either method. It was surmised this may have been due to not drying the soy samples prior to analyses. The soy portion will be repeated with dried samples and analyses will be done by both labs in fall 2024. The group will also begin discussions on the harmonization of compositional analytes.

Nucleic Acid Working Group (J. Haudenshield): The group has 24 members. The NAWG has updated the slides for the AEIC website with latest technology information such as information on NGS methods, digital PCR, RT PCR, endpoint PCR, isothermal methods. The slides will be posted. Discussions on ambiguous results is on hold. Twelve YouTube videos were selected for educational materials and need re-revaluation for final selection. A proposed outline for the tentative publication (Applications of digital PCR in agriculture) is posted for group comments. The targeted submission date is April 2025.

Website Updates (D. Houchins, Romer Labs): The NAWG slides are now ready for website posting. Image citations for the slides are contained in slide footnotes. The Board has set up a paid Google account in order to share documents for review. There is 15gb of space. Folders are being set up. Some companies have reported that they are not allowed to access Google.

ISO Update (M. Sussman, USDA AMS): Mike oversees the ISO activities at the USDA. He is the TC 34 manager and Ray Shillito is the chair. TC 34 was founded in 2008 for GMO testing and output has been incorporated by reference in countries legislation. Topics covered include meat speciation, plant authenticity, food authenticity new generation nucleotide sequencing, biobanking, antimicrobial resistance determination, biorisk, qualitative method validation, PCR, isoPCR and microarray requirements. ISO TC 276 is for biotechnology, bio-banking, bioprocessing, and data management. TC 276 WG6 is for nucleic acid and protein-based devices and has new work items. IWA 47 is for reference architecture 9r data-driven agrifood systems. The mission is to create digital twin of agriculture.

AOCS Upate (D. Williams, AOCS): AOCS manages the TAG which is in charge of the Working Groups for SC 16. For those interested in joining the ISO TC 34 subcommitees or interested in making a contribution to AOCS for maintenance of these affiliations with ISO should contact denise.williams@aocs.org. The SC (subcommittees) and Working Groups (WG) are:

- SC 16 SC 16 Horizontal Methods for Molecular Biomarker Analysis
  - WG8 Meat Speciation
  - WG 9 Subsampling of Seeds and Grains
  - WG 10 Rapid Nucleic Acid Amplification Methods
  - JWG 11 Biobanking Agriculture and Food Products
  - JWG 12 Molecular biomarkers of agricultural fibers
  - WG 14 Genetically Engineered Content Detection and Quantification
  - WG 15 Single laboratory validation of qualitative real time PCR
  - WG 16 Revision of ISO 16393 (Performance characteristics of qualitative methods and validation of such methods)
  - WG 17 Plant Species and Foodstuffs using DNA-based Methods
  - WG 18 New generation Sequencing
- SC 2 Oleaginous seeds and fruits and oilseed meals
- SC 11 Animal and vegetable fats and oils
- SC 4 Cereals and pulses

AOCS also has certified reference materials of GM crops available. New and pending materials include:

- New Certified Reference Materials:
  - Bayer CropScience MON 88702 cotton (AOCS 1122-A)
  - Bayer CropScience MON 95275 maize (AOCS 1221-A)
  - Bayer CropScience MON 94804 maize (AOCS 1221-B)

- Corteva non-GM and DP-910521-2 maize (AOCS 0822-A and B)
- Corteva non-GM and DP-051291-2 maize (AOCS 0723-A and B)

- Pending New Certified Reference Materials:
  - Bayer CropScience MON 95275 maize (AOCS 1221-A)
  - Corteva non-GM and DAS-01131-3 maize (AOCS 0922-A and B)
  - Bayer CropScience MON 94637 soybean (AOCS 1023-A)
  - Corteva non-GM and COR-23134-4 soybean (AOCS 0124-A and B)
  - Syngenta non-GM and MZIR260 maize (AOCS 0224-A and B)
  - KWS KWS20-1 sugar beet (AOCS 0523-B)
  - Bioceres non-GM and HB4 soybean (AOCS 0623-A and B)

For more information on Certified Reference materials, visit Certified Reference Materials (CRMs) (aocs.org).

AOCS launched in spring 2024, the 8th Edition of Official Methods and Recommended Practices of the AOCS. Check out the all digital platform and site license options at https://library.aocs.org/.

The AOCS Annual Meeting and Expo will be held in Portland, OR on April 27-30, 2025. For more information go to AOCS Annual Meeting.

AOAC (D. Houchins, Romer Labs): The Midwest section of AOAC met in June and had sessions on agricultural products, fertilizer and biostimulants. AOAC is reorganizing the sections to have only five North America sections. The International AOAC meeting in August had many sessions on microbiology, discussion on AI and discussion in mycotoxin community on test performance document. The agenda for the meeting was contained in an app so information was easy to access during the meeting.

Annual CRISPR AgBio Congress (J. Zheng, ICIA): The conference was held in February in RTP, NC. There were 80 participants, 19 presentations and a panel discussion. The objective of the meeting was improving consumer perception of the technology. Attendees included many start-up companies, BASF, Bayer, Corteva, Syngenta. The next two meetings will also be held in RTP. The registration fee is $2000.

HESI Protein Safety Workshop (T. Geng, Corteva): The HESI Workshop—Safety Assessment of Newly Expressed Proteins in Foods: Need for Evolution—was held October 21-22 in Porto, Portugal. The workshop was also broadcast online. AEIC was a sponsor for the workshop as BASF, Bayer, Corteva and Syngenta contributed funds via AEIC. The objective of the workshop was to bring together research scientists from academia, industry and government agencies to review current scientific advances and address particular challenges related to the safety evaluation of proteins in GM products and novel foods/feeds.

The AEIC Business Meeting was adjourned.

INVITED TALKS

Rice Breeding 101 (J. Famoso, LSU Rice Research Station): Rice was introduced into the US in South Carolina in the 1600s. Production of rice moved from South Carolina westward following the Civil War. Modern rice production began in Louisiana in 1880. The state offered advantages for rice growing such as a shallow clay pan, long growing season, mild climate, abundant rainfall and unsettled inexpensive land. The Cajun people grew rice for their own consumption. Settlers from the Midwest adapted to growing rice. As the population doubled, new technology was introduced and the mills shifted to the production areas. Southwest Louisiana became the 2nd or 3rd rice producer. Arkansas is the largest producer. In 1909, the rice research station was founded near Crowley, LA. The station has 50 faculty/staff who do work in rice breeding, agronomy, pathology and entomology. US rice is grown on 2-3 million acres in Arkansas, California, Louisiana, Missouri and Texas. Half of the rice crop is exported. In Louisiana, 75% of the rice is produced in the southwestern portion of the state. Farmers rotate rice with crawfish production. Head rice is sold in bags in grocery stores and second head rice is sold for flour, use in pet foods, use in beer brewing. Rice breeding began in 1908. Currently, there are 65 released varieties which include Clearfield, Provisia and non-GM varieties. Breeding is done for profitability, sustainability, yield and quality. It takes 8 years for variety development. The stages of rice breeding include population development, line development, preliminary yield testing, advanced yield testing, purify and release. Markers have transformed the breeding process. Planting in Puerto Rico is used to speed the process. Marker selection is used for specific trait(s). Markers are useful on highly heritable traits but there are limits on the number of loci. Preliminary variety testing is done in limited environments. The best material is selected for advancement. Genotyping is outsourced to AgriPlex Genomics which uses a genome wide marker data to estimate performance. It does not require specific data and is benificial for quantitative traits as it provides accuracy, low cost/logistics, increased population sizes, reduces cycle time and maintains genetic diversity. Advanced yield testing is performed in more environments. Selection is based on phenotype. Testing is done for a line to show flaws. Selfing in purification/profiling stage reduces heterozgousity in genome of the plant. Most varieties are F5 derived with heterogeneity expected and accounted for in genetic profiles. University programs are an important source of commercial lines. No one size fits all. Clear objectives in breeding are needed for focus. Technology is useful but only a means to an end. Execution is more important than good ideas. Programs need to constantly evolve and use teams with complementary skills and an aligned vision.

Technologies in Rice Breeding Research for Grain Quality (R. Bautista, RiceTec): RiceTec is owned by a EU state and markets products in EU. The races of rice are indica (most common), japonica and javanica. Long-grain rice is common, called table rice and is also used in pet foods an brewing. Medium and short-grain are used in cereals, soups, baby foods and brewing). China and India are the biggest rice producers. Over the years, production has increased but acreage did not. A 2.4% yield increase per year is

needed to meet anticipated demand in 2050. Consumers have a cooked rice texture preference. Quality of rice includes size, starch content and use. Strategies to meet demand in 2050 include accelerating genetic gain, speed breeding (GaP), use of new tools (gene editing, mapping). Breeding addresses quality via yield increases, milling properties, appearance and functional properties. Gene editing is not considered genetically modified in many geographies so this opens new avenues for quality. Breeding for quality traits is complex to manage. This includes moisture content, grain damage, physical attributes (chalk, fissuring, whiteness) and chemical properties (cooking, texture). Factors for quality include genetics, biotic/abiotic, agronomic, pre-/post-harves handling, processing, kernel defects (fissure, broken mechanically, insect damage, immature grains), chalky (temperature is a factor). Harvesting at 16.4% moisture gives more uniformity. High humidity in the morning will facilitate grain cracking since the rice takes up moisture and then releases it during day (absorption/desorption). The drying principle for rice is air moisture = grain moisture. Drying is affected by air flow rate, drying air temperature, initial moisture content, inherent characteristics, impurities and grain layer depth. Glass transition theory in drying includes a rubbery region and a glassy region. Tempering helps to equilibrate moisture. In bin drying, the drying starts at the bottom and moves to the top. Bin fan must be adequate to move heat. Stirring bin contents sometimes helps. For milling, the milling degree means more whole grain gives more value. Bran should not be lost in milling either. Hybrid rice mills faster than inbred rice. Essential rice chemistry includes amylose and amylopectin content. If they are high, it affects the rice texture.

Transforming Regenerative Rice Systems in Asia (A. Trikha, Bayer Crop Science): The Green Revolution addressed food security by changing how rice was grown in Asia. Rice is a domestically consumed crop with only 9% being traded. This is a pivotal time for rice as there is increased demand and increased pressure on the planet, thus how rice is grown needs to be changed. Approximately 35% of farmers say climate change is already affecting rice. Developing countries have an interest in using digital methods, are open to implement new technologies but also want more credit for what they are doing. The primary method of planting is transplanting seedlings and then flooding of the fields. Transplanting is labor intensive and water usage is great. This needs to change to direct seeding and releasing water gradually. Drone seeding has become important as well as other mechanical means. Transforming rice systems is centered on farmers implementing innovation, digital methods (cell phones), sustainability (reduce greenhouse gases) and partnerships (bring in mechanization). For instance, India is now allowing the use of Clearfield rice. Rice breeding has undergone a large transformation in last 50 years at Bayer. Breeding programs have increased in size and field testing has increased. AI capabilities are expanding. There has been reduction in time going from F1 rice to commercial varieties. Key enablers are weed management, digital tools and mechanization. Direct seeding affords 50% reduction in labor = 15-25% lower costs, opens new income streams and helps pass along better soils to the next generation of farmers.

Production, Quality and Export Logistics of Rice (J. Hobbs, Russell Marine Group): Russell Marine Group (RMG) is privately owned with 75 employees. Its business is supervision/logistics for exporters. RMG handles 25 million tons of grain with 2% of this being rice. It ensures quality standards (moisture, milling yields,damage levels). China and India are the biggest producers and users of rice. The US exports its rice to the LATAM region. Mexico, Honduras, Japan, Haiti and Canada main importers of US rice. Japan mainly imports rice from California. US does not have government storage capabilities, rather it is done using privately owned bins and barges. Transportation of grain in the US is done mainly by rail, truck and barge. Trucks transport from farm to barge. Barge transportation relies on the navigable river system in the US. Barge movement is coordinated on the rivers to move grain to Gulf of Mexico for loading on ships. There are 18000 barges in the system which travel an average distance of 475 miles. Economy of scale makes barges a cheaper means of transport. Heavy grains are regulated under the US Grain Standards Act, however, feed by-products and rice are not regulated under this law. Domestic traders do the first QC checks on grain and the barge inspection is the second check. The grain is sampled when offloaded from the barge to the ship. Ships are checked for cleanliness by the USDA prior to loading from elevators and floating elevators. The vessels are tubed for fumigation prior to loading cargo. Bucket and midstream buoys are used to load cargo directly from a barge to a ship. Floating elevators move grain from barge to scale and then to a vessel. Barge covers are unloaded by lifting the cover and then a bucket machine removes the grain. Ship holds can be separated by plywood to hold more than one type of grain. There are 50,000 bulk carriers in world fleet which move 4 billion tons of grain. The opening of the third lane of the Panama Canal allows the largest ships to go through.

Intractable Proteins in GM Crops and Their Safety Assessment (R. Wang, Bayer Crop Science): Intractable proteins are difficult to express, quantify, isolate, concentrate and purify. This makes it difficult to demonstrate equivalency between the plant-expressed and heterologous protein. Small number of proteins are antinutrients and allergens so each newly expressed protein must be assessed. Seventy-nine percent (79%) of food allergens belong to 12 protein families. There is no single test for allergenicity so a weight of evidence (WOE) is used to assess. This includes the history of safe use (HOSU) of protein, in silico assessment (sequencing), in vitro assessment (digestibility, heat stability), in vivo testing (acute toxicity, 28d toxicity), non-target (section of species to test), expression (dietary risk). Examples of intractable proteins that have been deregulated include transmembrane proteins, transcription factors and R-protein (Simplot). The test protein was qualified using 3 endpoints: intactness, identity and structure/function. WOE and hyposthesis-base safety assessment were used to assess whether a hazardous MOA is present. If not present, no tox is conducted. Transcription factors are difficult to isolate and may require a disulfide bond which needs refolding. They need a strong HOSU and generally not allergenic and have no indication of unintended effects on nutrition or food/feed safety. The R-protein is difficult to express

but have a safe history of consumption. The R-protein is not detected in potato variety so the risk is extremely low. Considerations when working with intractable proteins include: different expression system or tissues are needed to generate newly expressed protein; may require an enriched sample, direct use of plant material or cultured cells; sensitive analytical tools/methods are needed. Protein characterization/equivalency are usually done by core analyses (MW, amino acid sequence, functional activity). Alternative would be to use WOE as the principle (molecular data, phenotype, structural similarity). Tox assessment is hypothesis and exposure-based. Acute tox should be conducted with a scientific rationale, i.e., conduct when a potential hazard is identified. Alternative methods are needed when a high dose is not feasible. The 28d tox test does not add any new information beyond the acute tox testing. Protein stability testing and NTO testing should be supplementary studies since there is no direct link to allergenicity or toxicity (digestibility). NTO should be done by hypothesis or exposure-based and use partially-purified protein or enriched sample or plant tissues. Studies are done in a controlled environment.

Challenges and Strategies in Custom Antibody Development for the Rapid Diagnostic Industry (A. Johnson, EnviroLogix): The Rare Reagents team in EnviroLogix was established in 2005 and provides materials internally giving freedom to operate and ability to customize reagents. The antibody development program created 2700 monoclonal lines. Polyclonal antibody development is done to a lesser extent. Antibody development is driven by stringent immunogen selection. Monoclonal development challenges include achieving high sensitivity, robust IgG titer, thermal/chemical stability, establish sustainable and consistent cell lines and reproducible. Polyclonal development challenges include reliance on outside vendor, consistency differences, specificity, animal health considerations and other external variables. Hybridomas for monoclonal antibodies are made by collecting memory B cells →fuse with myeloma cells to immortalize. For specific monoclonals, an immunogen is designed → immunize → screen animal serum →perform fusion→raw fusion supernatants are screened→subclone monoclonals→purify raw antibody. Immunization may be done intramuscular, IV or inhalation. Factors for immunization include amount needed, adjuvants, duration and frequency. Protein immunogens will naturally elicit an immune response. The protein source can dictate immunogencity and whether the protein is in a native form or denatured, whole vs subunit, post- or pre-translational. Small molecules require a protein tether with point of attachment and linkage method being important. A project is initiated with no less than 3 unique conjugates where main components are varied. Specificity immunogens are different protein targets with close homology. Synthetic peptides may be used. Antibody attributes are responsible for specific target recognition which is always understood because of subtle chemical differences. Peptide immunogens can drive reactivity. Some target derivations can make extremely sensitive antibodies, but only towards the modified form. Antibody profiling is done by HPLC, zonal gels for purity and isoelectric focusing. Stability is assessed by UNCLE which is quantitative characterization of

reagent stability ahead of assay development. Thermal stability is assessed first using fluorescence. Next is the use of dynamic light scattering to determine aggregation or degradation. Finally static light scattering is used for one point in time to determine the molecular weight. Antibody screening is done with ELISA which can determine the speed of reactivity, perform buffer challenge, heat challenge. Mock LFDs are also used. Surface plasmon resonance looks at the strength of binding in real time and is flexible with buffer systems. Cell culture challenges include maintenance of hybridomas, clonal drift, initial monoclonal cell isolation. Immortality of lines is achieved through diligence. Large scale production requires validation of raw material and purification preparation. Antibody characterization can change with scale and impact stability. Heterohybridomas are cell fusions using partner and B cells from different species. They tend to not be stable. MIPs are plastic antibodies, i.e., casting polymers on targets with variety of monomers which creates a mold that functions as an artificial receptor. Natural receptors to be used as antibodies. Recombinant antibodies are screened via bio-panning using flow cytometry to identify high binding antibodies and then clone these. Antibodies can be used as aptamers in assays that are enzyme driven by inhibiting activity.

Cybersecurity (D. Sprys, FBI): Less than half of the cybersecurity incidences/crimes are reported (reporting can done at www.IC3.gov). In 2023, cybersecurity crime resulted in $12.5 billion loss. The types of cybersecurity crime include technical support, extortion, non-payment/non-delivery, personal data breach. Social engineering is tricking people to divulge personal information. Types of social engineering include phishing (email to many individuals), spear phishing (email to groups) and whaling (email to top management). Typosquatting is done by changing an internet site address by one letter so when clicked on the person is sent to a fake site which looks legitimate. Before clicking on an internet link always consider the source and scrutinize the site address. Business email can be compromised by use of the wrong domain. This resulted in $3 billion in losses in 2023. Attacks are engineered by first identifying the target (person or group). Email account is then compromised and the cyber actor then monitors email awaiting wire transactions. The target company prepares to send the wire transfer and when sent wired funds go to a fake account. Always verify any changes to wire transactions and monitor suspicious email activity. Ransomware can shut down companies. Healthcare companies, critical manufacturing companies and government entities are favorite targets. Done by infecting computers with malware which encrypts victim data making them unreadable. The criminal entity then demands payment to decrypt files/network or extort the victim. New ransomware is always being launched. Protect your systems by focusing on awareness, keep software patches up to date, manage privileged accounts and keep back ups current and isolate any infected computer. Contact the FBI. Russian Federal Service had sophisticated espionage tool for long-term monitoring of targets. A fake Windows application was used in a spear phishing attempt which impersonated a bank to gain access to personal information. Hacktivists are a collective of cyber criminals who conduct cyber activities to advance political goals. Always file a complaint and the FBI

Recovery Asset Team (RAT) will try to recover money. The RAT has a 71% success rate. A ransomware guide can be found at www.cisa.gov.

Attendees:

Name	Organization
Ambrose, Jeffrey	EurofinsGS
Ament, Chris	Eurofins FCT
Atkinson, Tara	Corteva
Avalos-Ochoa, Daniela	ISU Seed Lab
Chamberlin, John	EnviroLogix
Cheever, Matt	BASF
Collum, Richard	Corteva
D'Andrea-Ward, Zach	EnviroLogix
Dharmasri, Cecil	Bill & Melinda Gates Agricultural Innovations
Edmison, Dustin	EPL Bio Analytical Services
Fast, Brandon	Corteva
Fendley, Ann	BASF
Gadola, Mary	Neogen
Geng, Tao	Corteva
Gillikin, Nancy	BASF
Ghavami, Farhad	Eurofins BDI
Haas, Jeff	Bayer Crop Science
Haudenshield, James	Individual
Houchins, Donna	Romer Labs
Hunst, Penny	Ag Consultant
Islam, Shofi	ICIA
Johnson, Adam	EnviroLogix
Johnson, Virginia	Bayer Crop Science
Kenward, Kimberly	20/20 SeedLabs
Kouba, Kristen	Corteva
Lamare, Megan	EnviroLogix
Makani, Mildred	Syngenta
Mitchell, Carter	Kemp Proteins
Muschinske, Luke	Eurofins MBL
Scaife, Ann	Eurofins FCT
Schaefer, Elena	Simplot

Shippar, Jeffrey	Eurofins
Smith, Pearce	EurofinsGS
Sondeno, Rachael	OMIC USA
Spiegelhalter, Frank	Eurofins GS
Sussman, Michael	USDA AMS
Umthun, Angela	Individual
Verhalen, Brandy	Corteva
Wang, Rong	Bayer Crop Science
Whitt, Sherry	BASF
Williams, Denise	AOCS
Wu, Pei-Ying	BASF
Yau, Kerrm	Corteva
Zhang, John	Corteva
Zheng, John	ICIA