



Est. 1992

THE FIRST 30 YEARS

P.L. Hunst, Ph.D.
AEIC Secretary



Analytical Environmental Immunochemical Consortium



Analytical Excellence through Industry Collaboration

Where did we begin?

- 1992 EPA Immunochemistry Summit (Las Vegas)
 - Discussion on the use of immunoassays for regulatory testing of new chemical products
 - Several critical issues identified to address before immunoassays would gain acceptance for chemicals:
 - Need for better communication among kit developers, users and regulators
 - Need for standards and regulatory guidelines for acceptance of immunoassay data
 - Need for educational programs for regulators and new users
 - Need for policies to safeguard the quality of commercial immunoassay kits and applications that utilized the kits
 - EPA strongly suggested that industry take on these issues

First Meeting

First organizational meeting of industry group held at Dow Chemical (Midland, MI)

- Defined objectives, organization definition and formed committees (communication, guidelines, administration)

Meeting held in May at American Cyanamid (Princeton, NJ)

- Proposal for by-laws/administrative procedure
- Updates from Guidelines Committee, Communication Committee, Affiliations Committee
- Presented organization at EPA Immunochemical Summit in Las Vegas in September, 1993

Held meeting in January at Ciba-Geigy (Greensboro, NC)

- Mission/objectives discussed and defined to include consensus, education, regulatory agencies, performance-based method acceptance

1993

1992

1993

The First Years: 1993-1998

- Focus was on immunoassays for environmental applications as an alternative to mass spectrometry
- Activities
 - Immunoassay and kit insert guidelines published
 - Educational efforts
 - Workshops with EPA Office of Pesticides Programs, EPA Office of Solid Waste, EPA Office of Water
 - Effort to familiarize government scientists and regulators on immunoassay technology
 - Coordinated by AEIC members and hosted in Washington, DC



1999: The Year of Change

- Agricultural biotechnology was developing rapidly in the U.S.
- Some AEIC member companies were agbiotech trait providers
- AEIC Biotech Committee proposed that AEIC become more involved in the immunoassay needs/issues for agbiotech
 - Biotech initiative was proposed and accepted at 1999 Spring Meeting
 - Develop performance-based method validation guidelines for determination of new proteins in GMO plant matrices;
 - Serve as global educational resource to regulatory bodies and end users
 - Engage in industry-wide effort to obtain consensus on guidelines for the proper use of immunoassays
 - Facilitate AEIC education regarding development of other methods of detection and quantitation
 - Increase awareness of immunoassay methods as a compliance tool for GMOs
 - Ensure guidelines are available for validation and use of immunoassay methods for GMOs
 - Provide a forum for communication and education regarding GMO detection methods

The “new” AEIC

- Name change was proposed
 - Group decided that AEIC should be retained and just change what each letter stands for
- 2005: Membership was asked to help with the new name
- Many suggestions but group settled on “Analytical Excellence through Industry Collaboration”
- Logo was also changed to better represent both protein detection and nucleic acid detection



2005 to present

AEIC has focused more on biotechnology detection methods

- Both protein-based and nucleic-acid based

Member companies expanded

- Now include analytical labs, seed testing labs, equipment manufacturers for protein and nucleic acid testing, food and mycotoxin testing companies, and GM trait providers

Members

1993

- American Cyanamid
- Tennessee Valley Authority
- Monsanto Products
- Strategic Diagnostics
- CIBA-GEIGY
- FMC
- Omicron
- Novo Nordisk
- Miles, Inc.
- Millipore

Ensys

Zeneca

DuPont Ag

Dow Elanco

Dow Chemical

Neogen

Battelle

Quantix

IDETEK

2022

- Bayer Crop Science
- BASF
- Corteva
- Syngenta
- Eurofins BDI
- Eurofins Microbiology Labs
- Eurofins Food Chemistry
- Indiana Crop Improvement
- SoDak Labs
- SGS NA
- EPL Bio Analytical Services
- 20/20 Seed Labs
- OMIC USA
- Schafer Scientific Solutions
- Kemp Proteins

Merieux NutriSciences

Agdia

AgriPlex Genomics

AgReliant Genetics

AOCS

EnviroLogix

Eurofins Food Integrity & Innovation

FoodChain ID

Eurofins GeneScan

Forage Genetics

Illinois Crop Improvement

Neogen

Romer Labs

Simplot Plant Sciences

AEIC Today

- **Mission:**
 - To advance and support all bioanalytical technologies through:
 - Providing a consensus voice for applications to agricultural, biotechnology and environmental industries
 - Developing educational programs
 - Furnishing scientific expertise
 - Establishing performance standards for immunochemical, nucleic acid and bioanalytical methods
- **Education is still a pillar of the mission**
 - Publications a big part of this
- **Bringing “one voice” to regulatory authorities is also still important**
 - AEIC funding of ANSI ISO
 - Valued participation of government agencies (USDA AMS, EPA)

Publications

- Shillito, R., Whitt, S., Ross, M., Ghavami, F., De Vleeschauwer, D., D'Halluin, K., Van Hoecke, A., Meulewaeter, F. 2021. **Detection of genome edits in plants--from editing to seed.** In Vitro Cellular and Developmental Biology - Plants; ([Detection of genome edits in plants—from editing to seed \(springer.com\)](https://doi.org/10.1007/s11627-021-10000-0))
- Wang, R., Houston, N., Cheever, M., Geng, T., Gillikin, N., McDonald, J., Serrano, H., Shippar, J., Tetteh, A., Wang, Y., Liu, Z. 2020. **Can mass spectrometry analysis of in vitro digestion products improve the assessment of allergenic potential of a newly expressed protein?** J. Regulatory Science 9(1) (2020): 76-83.
- Alarcon, C., Shan, G., Layton, D.T., Bell, T.A., Whipkey, S. and Shillito, R.D. 2019. **Application of DNA- and protein-based detection methods in agricultural biotechnology.** J. Agric. Food Chem. DOI: 10.1021/acs.jafc.8b05157.
- Breeze, M.L., Leyva-Guerrero, E., Yeaman, G.R., Dudin, Y., Akel, R., Brune, P., Claussen, F., Dharmasri, C., Golbach, J., Guo, R., Maxwell, C., Privalle, L., Rogers, H., Liu, K., Shan, G., Yarnall, M., Thiede, D. and Gillikin, N. 2015. **Validation of a method for quantitation of soybean lectin in commercial varieties.** J. AOCS 92(8): 1085-1092.
- Privalle, LS, Chen, J, Clapper, G, Hunst, P, Spiegelhalter, F and Zhong, C. 2012. **Development of an Agricultural Biotechnology Crop Product: Testing from Discovery to Commercialization.** J of Agric. and Food Chem. 60(4): 10179-10187
- Pantella, V. 2007. **Testing Oilseeds for GMOs.** AOCS 18(3): 154-156.
- Grothaus, GD, Bandla, M., Currier, T, Giroux, R, Jenkins, R, Lipp, M, Shan, G, Stave, S and Pantella, V. 2006. **Immunoassay as an Analytical Tool in Agricultural Biotechnology.** J. AOAC 89(4): 913-928.
- Lipp, M, Shillito, R, Giroux, R, Spiegelhalter, F, Charlton, S, Pinero, D and Song, P. 2005. **Polymerase Chain Reaction Technology as Analytical Tool in Agricultural Biotechnology.** J. AOAC 88(1): 136-155
- Lipton, CR, Dautlick, JX, Grothaus, GD, Hunst, PL, Magin, KM, Mihaliak, CA, Rubio, FM and Stave, JW. 2000. **Guidelines for the Validation and Use of Immunoassays for Determination of Introduced Proteins in Biotechnology Enhanced Crops and Derived Food Ingredients**
- Reeves, SG, Berberich, S, Dautlick, J and Mihaliak, C. 1996. **The Analytical Environmental Immunochemical Consortium.** Food Agric. Immunol. 8: 137-139.
- Mihaliak, C., Nardone, D and Nugent, P. 1996. **Why are Immunochemical Tests Important?** Immuochemical Methods Food Testing and Analysis 2: 8-9.
- Mihaliak, CA and Berberich, SA. 1994. **Guidelines to the Validation and Use of Immunochemical Methods for Generating Data in Support of Pesticide Registration. In: Immunoanalysis of Agrochemicals: Emerging Technologies.** Eds. Nelson, JO, Karu, AE and Wong, RB. ACS Symposium Series 586: 288-300.
- **[A USER'S GUIDE TO ENVIRONMENTAL IMMUNOCHEMICAL ANALYSIS](#)** - An excellent resource put together by the Environmental Protection Agency, Environmental Sciences Division AEIC Technical Comments Regarding Publication on "Performance Assessment of Rapid Immunological Test"



AEIC: History and Fun Facts



AEIC BOARD: Through the Years

Year	President	Vice President	Secretary	Treasurer	Past President
1992	Organizational year				
1993	Jim Rittenburg (AgriDiagnostics)	Brinton Miller (Neogen)	Pat Nugent (Dow Chemical)	Larry Miller (Battelle)	
1994	Chuck Mihaliak (Dow Elanco)	Cindy Lipton (Zeneca Ag. Products)	Pat Nugent (Dow Chemical)	Larry Miller (Battelle)	Jim Rittenburg (AgriDiagnostics)
1995	Joe Dautlick (SDI)	Rosie Wong (AmCy)	Pat Nugent (Dow Chemical)	Larry Miller (Battelle)	Chuck Mihaliak (Dow Elanco)
1996	Sharon Berberich (Monsanto)	Dave Grothaus (Pioneer)	Jan Sharp (Elf Atochem)	Larry Miller (Battelle)	Joe Dautlick (SDI)
1997	Dave Grothaus (Pioneer)	Chris Rankin (DuPont)	Jan Sharp (Elf Atochem)	Rosie Wong (AmCy)	Sharon Berberich (Monsanto)
1998	Chris Rankin (DuPont)	Jim Brady (Novartis)	Penny Hunst (Pioneer)	Rosie Wong (AmCy)	Dave Grothaus (Pioneer)
1999	Jim Brady (Novartis)	Brian Skoczenski (Millipore)	Penny Hunst (AgrEvo)	Kim Magin (Monsanto)	Chris Rankin (DuPont)
2000	Chuck Mihaliak (Dow AgroSciences)	Jan Sharp (Elf Atochem)	Penny Hunst (Dow AgroSciences)	Kim Magin (Monsanto)	Jim Brady (Novartis)

AEIC BOARD cont'd

Year	President	Vice President	Secretary	Treasurer	Past President
2001	Dave Grothaus (Pioneer)	Jim Stave (SDI)	Penny Hunst (Dow AgroSciences)	Kim Magin (Monsanto)	Chuck Mihaliak (Dow AgroSciences)
2002	Jim Stave (SDI)	Stacy Charlton (Syngenta)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Dave Grothaus (PHI)
2003	Stacy Charlton (Syngenta)	Marcus Lipp (Monsanto)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Jim Stave (SDI)
2004	Marcus Lipp (Monsanto)	Randy Giroux (Cargill)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Stacy Charlton (Syngenta)
2005	Randy Giroux (Cargill)	Ray Shillito (Bayer CropScience)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Marcus Lipp (Monsanto)
2006	Ray Shillito (Bayer CropScience)	Doris Dixon (Monsanto)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Randy Giroux (Cargill)
2007	Doris Dixon (Monsanto)	Gina Clapper (AOCS)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Ray Shillito (Bayer CropScience)
2008	Gina Clapper (AOCS)	Mike Thompson (Illumina)	Penny Hunst (Dow AgroSciences)	Dean Layton (EnviroLogix)	Doris Dixon (Monsanto)

AEIC BOARD cont'd

Year	President	Vice President	Secretary	Treasurer	Past President
2009	Mike Thompson (Illumina)	Frank Spiegelhalter (Eurofins GeneScan)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Gina Clapper (AOCS)
2010	Frank Spiegelhalter (Eurofins GeneScan)	Laura Privalle (BASF)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Mike Thompson (Illumina)
2011	Laura Privalle (BASF)	Clara Alarcon (Pioneer)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Frank Spiegelhalter (Eurofins GeneScan)
2012	Clara Alarcon (Pioneer)	Yelena Dudin (Monsanto)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Laura Privalle (BASF)
2013	Yelena Dudin (Monsanto)	Denise Thiede (Eurofins Biodiagnostics)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Clara Alarcon (Pioneer)
2014	Denise Thiede (Eurofins Biodiagnostics)	Guomin Shan (Dow)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Yelena Dudin (Monsanto)
2015	Guomin Shan (Dow)	David Levin (Covance)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Denise Thiede (Eurofins Biodiagnostics)

AEIC BOARD
cont'd

Year	President	Vice President	Secretary	Treasurer	Past President
2016	David Levin (Covance)	Charles Pick (SeqID)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	Guomin Shan (Dow)
2017	Charles Pick (SeqID)	Ray Shillito (Bayer)	Penny Hunst (Bayer CropScience)	Dean Layton (EnviroLogix)	David Levin (Covance)
2018	Ray Shillito (BASF)	Brenda Johnson (Eurofins Biodiagnostics)	Penny Hunst (BASF)	Dean Layton (EnviroLogix)	Charles Pick (SeqID)
2019	Brenda Johnson (Eurofins Biodiagnostics)	Lucy Liu (Bayer)	Penny Hunst (BASF)	Luke Muschinske (Eurofins Microbiology Labs)	Ray Shillito (BASF)
2020	Lucy Liu (Bayer)	Matt Cheever (BASF)	Penny Hunst (BASF)	Luke Muschinske (Eurofins Microbiology Labs)	Brenda Johnson (Eurofins Biodiagnostics)
2021	Matt Cheever (BASF)	Kristen Kouba (Corteva)	Penny Hunst (BASF)	Luke Muschinske (Eurofins Microbiology Labs)	Lucy Liu (Bayer)
2022	Kristen Kouba (Corteva)	Donna Houchins (Romer Labs)	Penny Hunst (BASF)	Luke Muschinske (Eurofins Microbiology Labs)	Matt Cheever (BASF)

Meeting Locations through the years



YearE	Spring	Spring Host	Fall	Fall Host
1992			Midland, MI	Dow Chemical
1993	Greensboro, NC (January) Princeton, NJ (May)	Ciba-Geigy American Cyanamid	Scarborough, ME	Millipore
1994	Indianapolis, IN	Dow	Palo Alto, CA	Idetek
1995	Kansas City, MO	Miles Labs	St. Louis, MO	Monsanto
1996	East Lansing, MI	Neogen		
1997	Wilmington, DE	DuPont	Durham, NH	SFAI
1998	Valley Forge, PA		Greensboro, NC	Novartis
1999	Princeton, NJ	FMC	Des Moines, IA	Pioneer Hi-Bred
2000	Painesville, OH	Ricerca	Portland, ME	Beacon Analytical Systems
2001	Indianapolis, IN	Dow	New Orleans, LA	GeneScan
2002	Raleigh, NC	Bayer	Minneapolis, MN	General Mills
2003	Wilmington, DE	Agilent	East Lansing, MI	Neogen
2004	Memphis, TN	Horizon Ag	Champaign, IL	AOCS
2005	Gastonia, NC	USDA AMS	South Bend, IN	Agdia
2006	Kansas City, MO	USDA GIPSA	Portland, ME	EnviroLogix
2007	Durham, NC		Portland, OR	OMIC USA

Meeting Locations cont'd

2008	New Orleans, LA	Eurofins GeneScan	St. Paul, MN	BioDiagnostics
2009	St. Louis, MO	Monsanto	RTP, NC	BASF
2010	Gastonia, NC	USDA AMS	Lincoln, NE	Neogen/GeneSeek
2011	Indianapolis, IN	Dow	Des Moines, IA	Pioneer Hi-Bred
2012	RTP, NC	Bayer	Portland, ME	EnviroLogix
2013	Madison, WI	Covance	Sacramento, CA	Monsanto
2014	San Antonio, TX	AOCS	New Orleans, LA	Eurofins GeneScan
2015	La Jolla, CA	Illumina	South Bend, IN	Agdia
2016	Raleigh, NC	BASF	Decatur, IL	EPL Labs
2017	Santa Clara, CA	Thermo Fisher	Indianapolis, IN	Dow AgroSciences
2018	Portland, OR	OMIC USA	Portland, ME	EnviroLogix
2019	New Orleans, LA	Eurofins GeneScan	Johnston, IA	Corteva Agriscience
2020	Virtual		Virtual	
2021	Virtual		Virtual	
2022	Virtual		Boise, ID	Simplot Plant Sciences





Fun Facts



- First official meeting held at American Cyanamid which became American Home Products which was bought by BASF
- AEIC Board has had representatives from 18 different companies
- AEIC has met in 17 different U.S. states
 - 7 times in North Carolina
- Only one group dinner was a fondue dinner (Wilmington, DE)
- Most expensive meeting venue was the Peabody Hotel in Memphis
- AEIC Secretary has represented 5 different companies
- Only one meeting has been held at a country club (DuPont Country Club)
- Most memorable group dinner was the Carolina BBQ and bluegrass band hosted by Bayer in North Carolina
- Most scenic meeting venue was the Black Point Inn in Prouts Neck, ME



Cheers for 30 more years
of AEIC