



University Industry  
Demonstration Partnership



## Session 1:

# Developing the Rationale for Consortia: Ashland's Involvement in Consortia

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# An Overview of Ashland Inc.

- A global leader in specialty chemical solutions for industrial & consumer markets
  - Total sales in 2015 were \$6B
- Over the past decade, Ashland has transformed itself from an oil company into a global, diversified specialty chemical company
  - Strengthened by the acquisition of Hercules in '08 & International Specialty Products (ISP) in '11

- Three operating divisions:

Specialty Ingredients



Valvoline



Valvoline will become  
a separate company  
in early 2017

I represent  
Performance Materials.  
HQ = Dublin, OH

Performance Materials



# Ashland Performance Materials (APM)

- Business-to-Business focus
- Major product lines
  - Resins for composites
  - Intermediates & Solvents



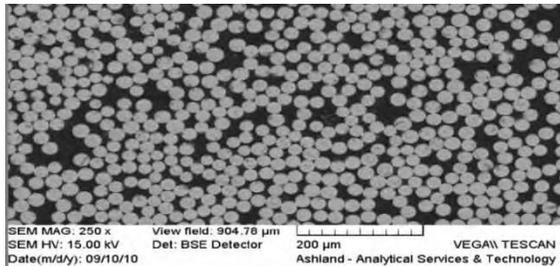
Courtesy: Kreysler & Associates



Courtesy: Composite Panel Systems



Courtesy: CSSI



## Microstructure of a fiber-reinforced polymer matrix composite:

Light phase = glass fibers  
Dark phase = resin matrix

- Composite resins are based on thermoset resin chemistry
  - Unsaturated polyesters
  - Vinyl esters
- Material **Substitution** & Material **Enhancement**
  - Replace / enhance metals, wood & concrete with composites

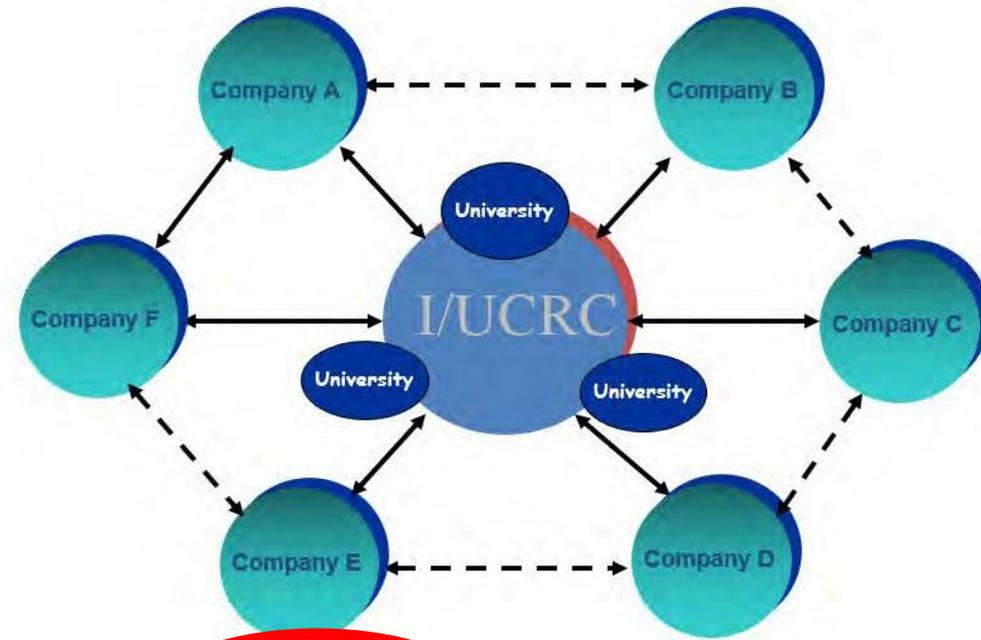
# My External Technology Role at Ashland

- Connect Ashland with other companies, universities, federal laboratories and other organizations that have already developed technology / products that we can use.
- Motivation:
  - Accelerate the development of new products, services & applications
  - Spur innovation
  - Supplement our internal resources with external resources
- Approach: 
- Key elements of my external technology role:
  - Technology scouting
  - Partnerships

# Interacting with Universities

- A key element of our collaboration strategy is membership in consortia and centers
  - University ERCs and I/UCRCs
  - Federal laboratory consortia

- The I/UCRC Model (Babu):



- Motivation:
  - Access to technology
  - Networking / partnering opportunities
  - Exposure
    - For Ashland
    - To students
  - Cost-effective spend of our funding for external technology

Multi-university increases the research base  
Multiple companies provide interaction capabilities

# APM's Membership in Consortia

Consortium	Acronym	Location	Overlap with APM
Advanced Structures & Composites Center	ASCC	Maine	Composites
Industrial Partnership for Research in Interfacial Mat'l's & Engineering	IPRIME	Minnesota	Polymers
Institute for Advanced Composites Manufacturing Innovation	IACMI	Michigan State, UDRI, Purdue, ORNL, NREL	Advanced Composites
Center for Bio renewable Chemicals	CBiRC	Iowa State, Rice, UC-Irvine, Wisconsin, Virginia	Bio-based chemicals
Ohio Bio products Innovation Center	OBIC	Ohio State	Bio-based chemicals
Center for Sustainable Polymers	CSP	Minnesota, Cornell, UC-Berkeley	Green Chemistry

# For More Information .....

Consortium	Website
Advanced Structures & Composites Center	<a href="http://www.composites.umaine.edu">www.composites.umaine.edu</a>
Institute for Advanced Composites Manufacturing Innovation	<a href="http://www.iacmi.org">www.iacmi.org</a>
Industrial Partnership for Research in Interfacial Mat'l's & Engineering	<a href="http://www.iprime.umn.edu">www.iprime.umn.edu</a>
Center for Bio renewable Chemicals	<a href="http://www.cbirc.iastate.edu">www.cbirc.iastate.edu</a>
Ohio Bio products Innovation Center	<a href="http://www.bioproducts.osu.edu">www.bioproducts.osu.edu</a>
Center for Sustainable Polymers	<a href="http://www.csp.umn.edu">www.csp.umn.edu</a>

Next session

THirstakk

# Benefits of IPRIME

Microstructured Polymers Group  
IPRIME

- IPRIME is an ERC that has “graduated”
- Multiple professors, multiple perspectives
  - M. Hillmyer: Bio renewable polymers
  - T. Lodge: Block copolymers
  - F. Bates: Toughening mechanisms
  - C. Macosko: Rheology
  - D. Morse: Modeling
- Networking
  - 39 member companies
- Students
  - Presentations & posters at annual meetings
  - Thesis defense

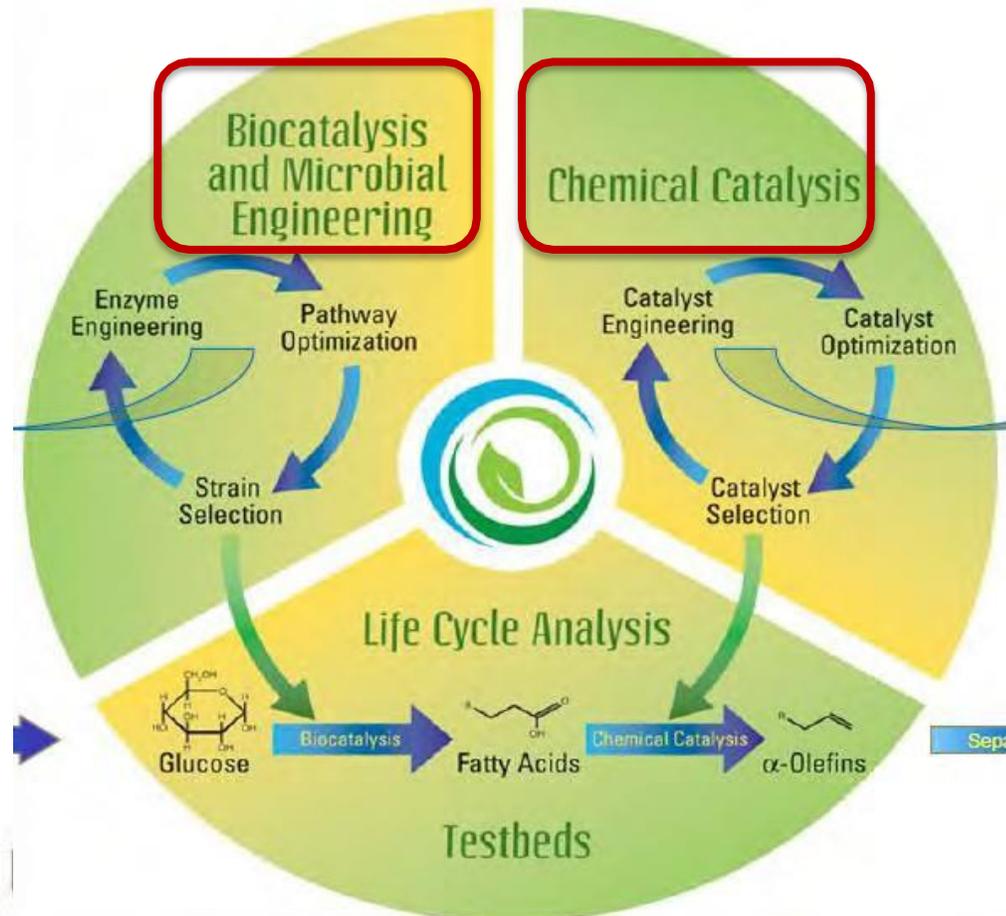
INDUSTRIAL PARTNERSHIP  
FOR RESEARCH IN  
INTERFACIAL AND MATERIALS ENGINEERING



Frank Bates (CEMS): Synthesis, Thermodynamics, Morphology, and Transport  
Marc Hillmyer (CHEM, Program leader): Synthesis, Functionalization, and Characterization  
Timothy Lodge (CHEM & CEMS): Diffusion, Scattering, Characterization, and Viscoelasticity  
Chris Macosko (CEMS): Processing, Compatibilization, Rheology  
David Morse (CEMS): Theory of Complex Fluids

# Center for Bio renewable Chemicals (CBiRC)

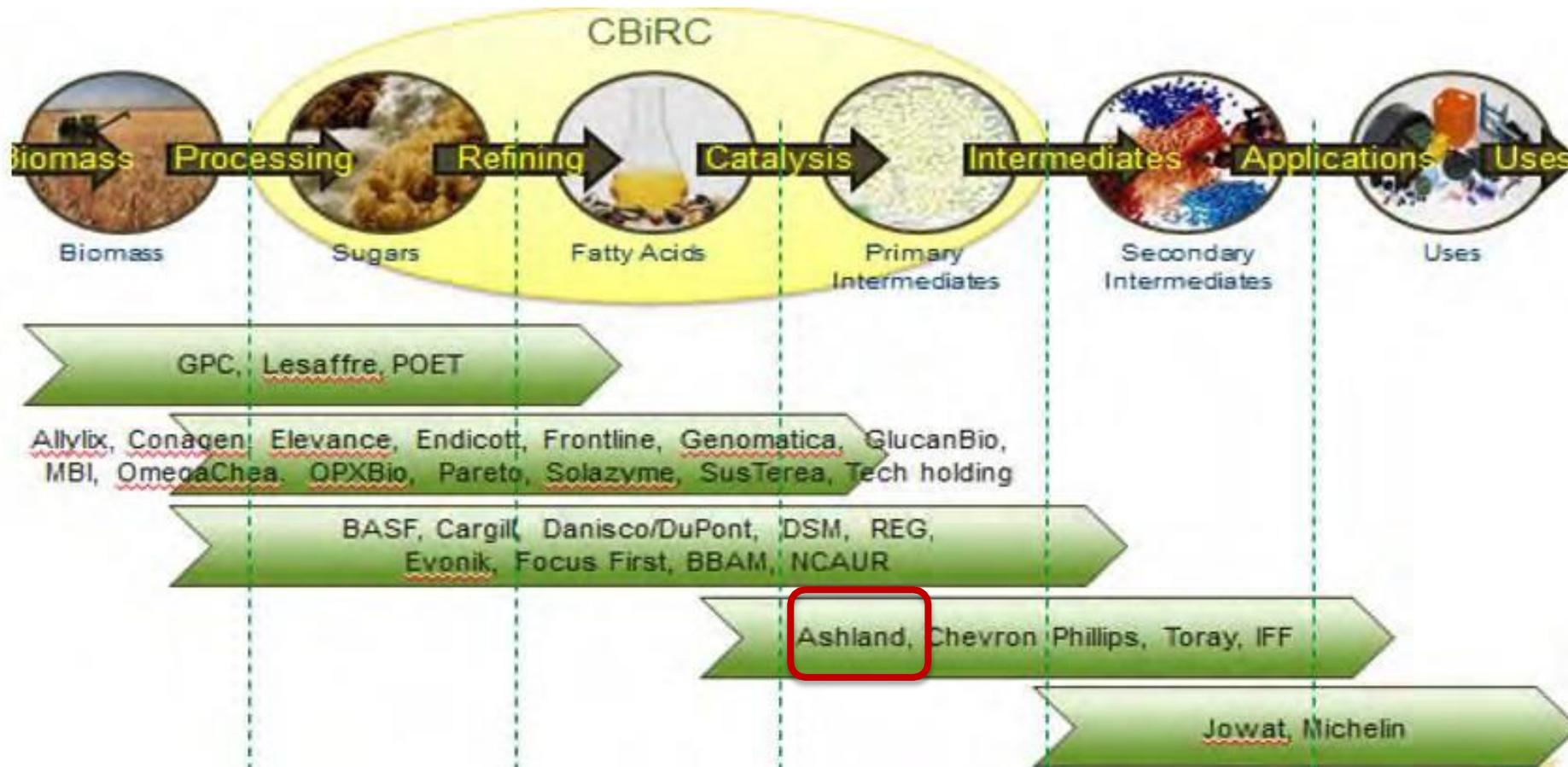
- Engineering Research Center (ERC) at Iowa State
- Researchers at Iowa State, Rice, Wisconsin, Virginia, UC-Irvine
- Over 30 industrial members



**CBiRC has helped us gain a much better understanding of fermentation**

# Networking Benefits of CBiRC

- CBiRC membership spans the entire value chain for bio-based chemicals



# How We Decide to Join Consortia

- **Existing Consortia:**
  - Attend a meeting as a guest
  - Meet with the director and the professors
    - Share list of external technology needs before the visit
- **New Consortia:**
  - Attend planning workshops and provide input
- **Decision Makers:**
  - Director of Emerging & External Technologies
  - VP-Global Technology
  - With input from:
    - External Technology Strategy Council
    - Technical group leaders
- **Criteria:**
  - Technology fit, Other members, Cost

# Lessons Learned

## From Ashland's perspective:

- Multi-university consortia are attractive sources of new technology and talent
  - Access to multiple professors, multi-disciplinary programs
  - Access to talented students
- Consortia can open up doors to new opportunities
  - Large companies, small companies, start-ups
  - Exposure and networking opportunities
- Consortia represent a cost-effective spend of our external technology budget
- It is helpful to have one point of contact for the industrial members

## From the Consortium's perspective:

- Consortia can use input from their IAB to ensure that their research portfolio is industrially relevant
- Industry involvement increases the chances of funding / renewal



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