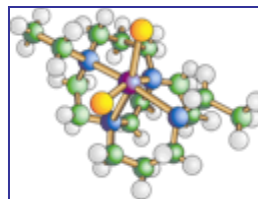


Center for Environmentally Beneficial Catalysis: Overview September 30, 2004



Designing environmentally responsible molecules, products, and processes – from the molecular scale to the plant scale.



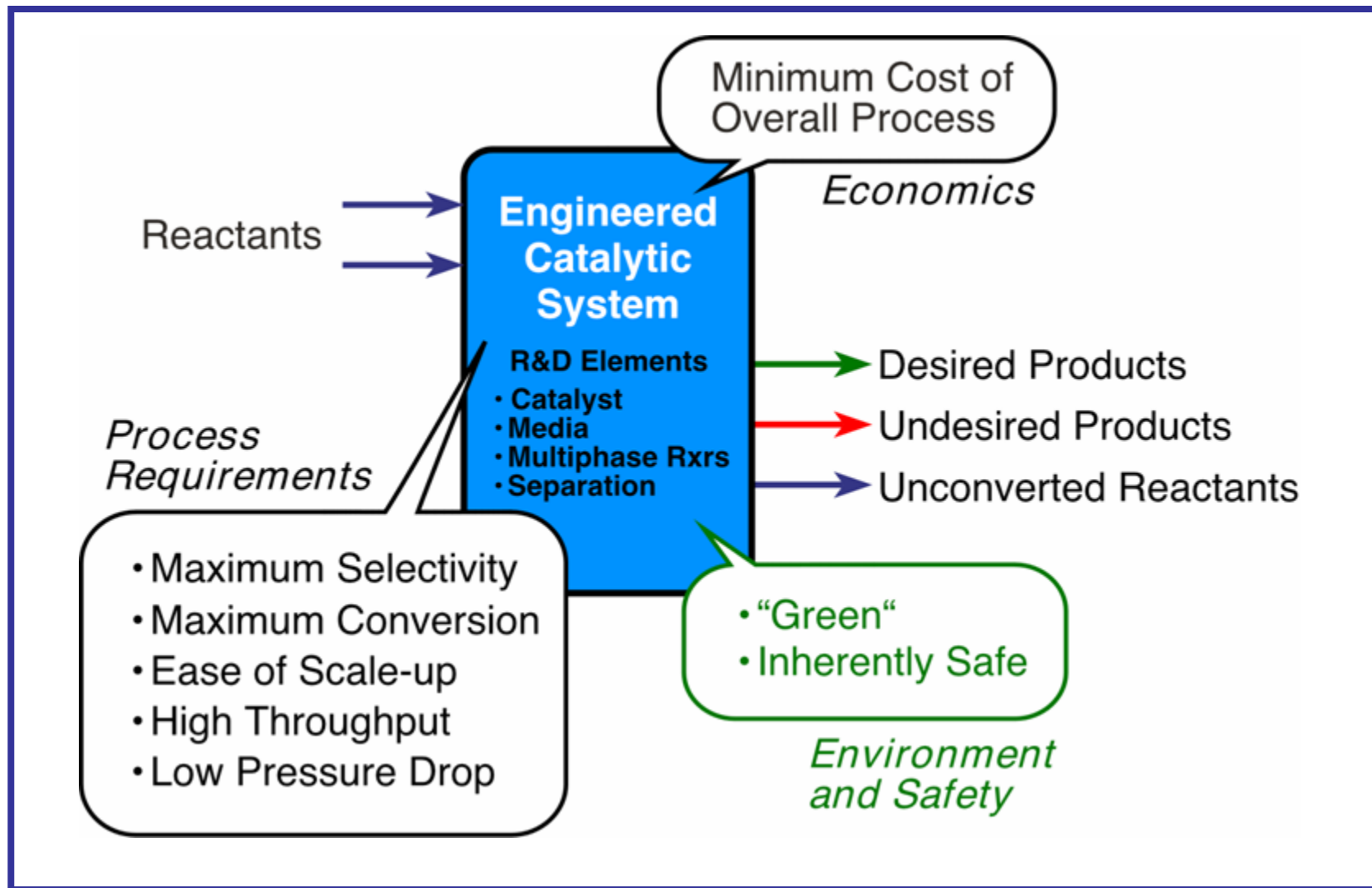
Lead Institution: University of Kansas (KU)

Core Partners: University of Iowa (UI); Washington University in St. Louis (WUStL); Prairie View A&M University (PVAMU)

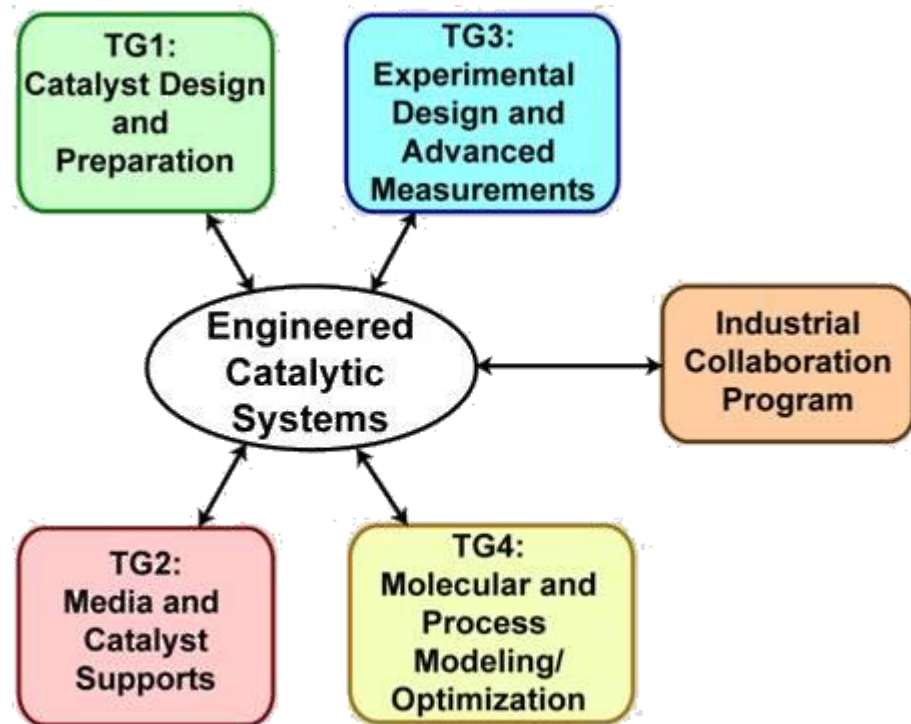
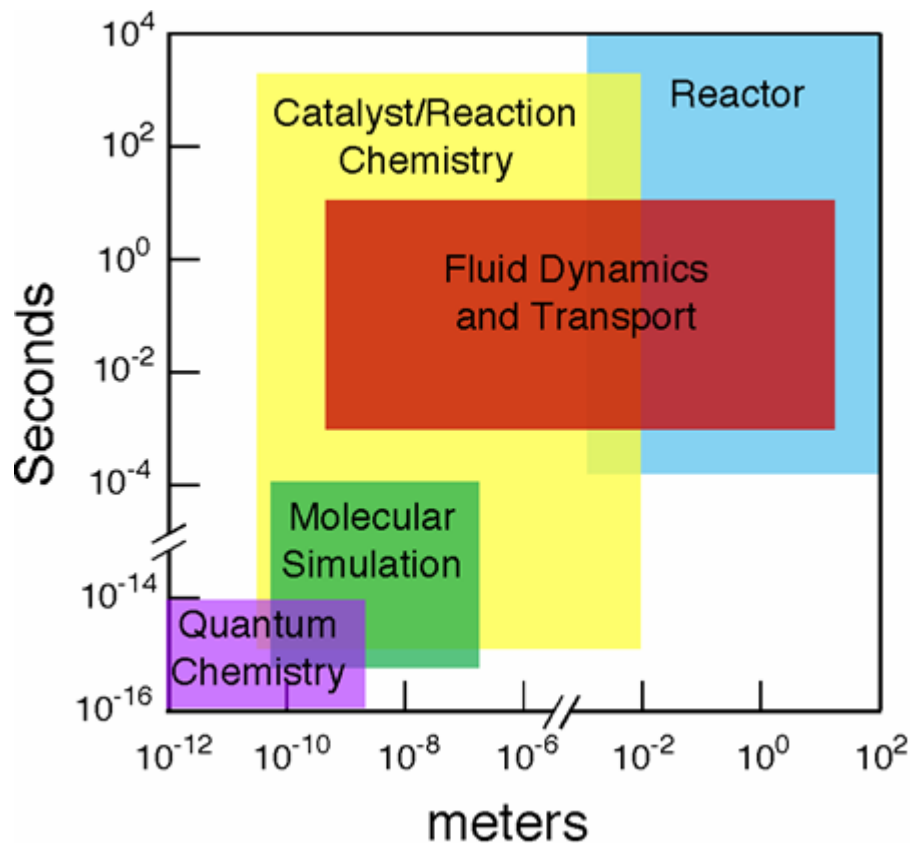
Director: Bala Subramaniam (KU); **Deputy Director:** Daryle Busch (KU)

Associate Directors: John Rosazza (UI); Milorad Dudukovic (WUStL); Irvin Osborne-Lee (PVAMU)

Developing Environmentally Beneficial Catalytic Processes: A Multiobjective Task



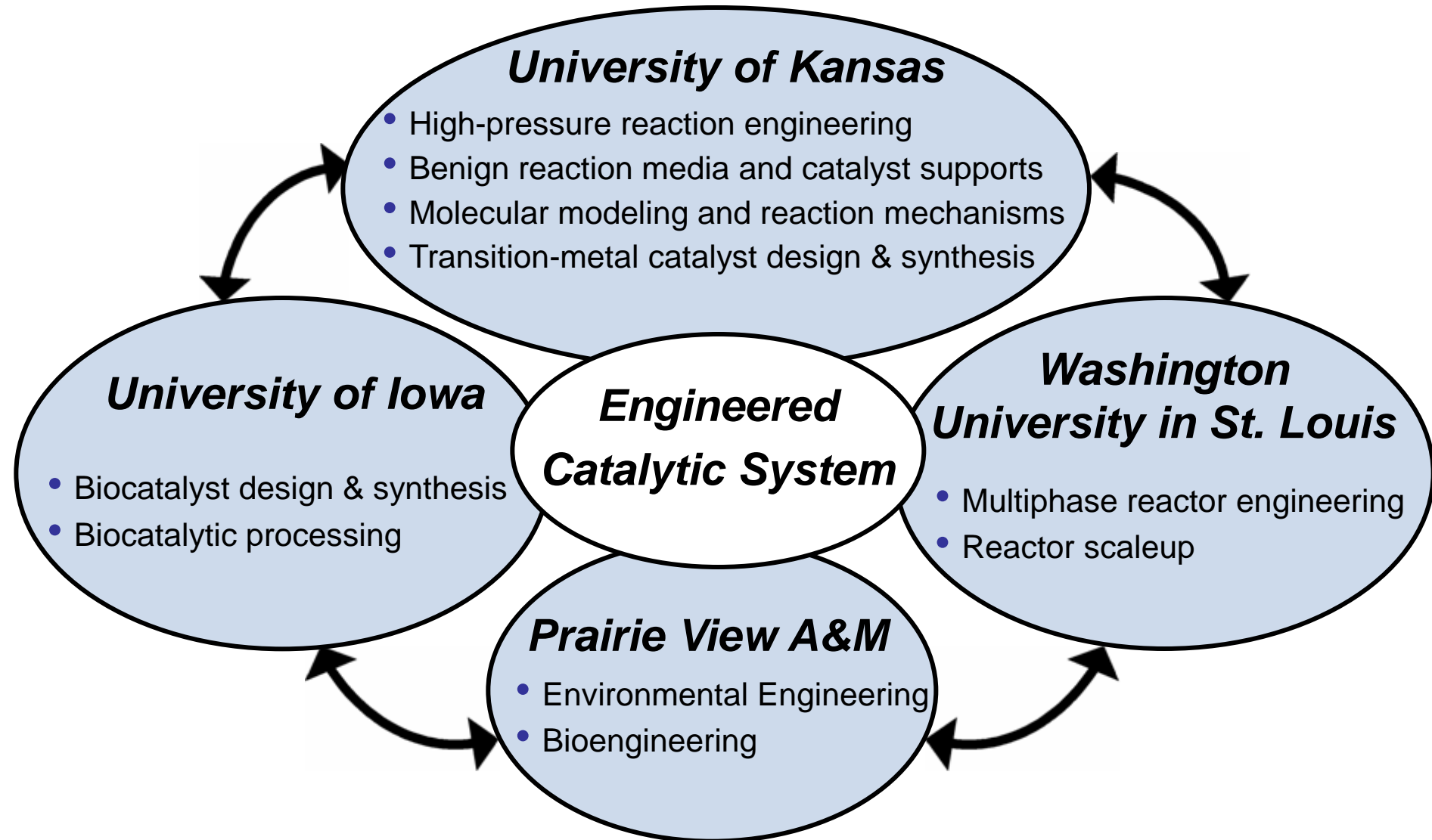
Multiscale Approach & Multidisciplinary Research Thrust Groups



Disciplines Represented in TGs

- *Engineering*: Chemical, Civil, Environmental
- *Sciences*: Chemistry, Biology

Multi-University Partnership: A Unique Resource for Catalysis Research



Near-Term (5 Yr) Goals

- Develop transformational catalytic technologies using CEBC's strategic research concept for the following classes of reaction systems (termed as *testbeds*)
 - Selective oxidations
 - Oxidative biocatalysis
 - Hydroformylations of olefins
 - Solid acid catalyzed alkylations & acylations

R&D Challenges & Expected Outcomes

- Catalyst design for selective, stable and atom-economical reactions
 - Novel biocatalysts, solid acid catalysts, homogenous and heterogeneous catalysts with nanoscale properties
- Design of “green” solvent media and catalyst supports
 - Water, CO₂-based solvents, nanoporous polymeric hosts
- Fundamentals of reaction mechanisms and reactor hydrodynamics
 - Advanced experimental methods for probing reaction mechanisms, transport properties and reactor hydrodynamics
 - Molecular-scale and CFD models
- Reactor selection, design and scaleup
 - Advanced multifunctional reactors and novel bioreactors based on the use of benign media and catalysts

Strategic Research Plan

