Updated 5-14

22nd Annual Green Chemistry & Engineering Conference

Portland, OR

June 18-20, 2018

Richard Blackburn and Julie Haack

Program Chairs

MONDAY MORNING

Plaza Foyer
7:00-5:00
Registration

Pavilion Ballroom
7:15-8:15
Networking Breakfast

Plaza Foyer
8:00-5:00
Exhibits

Pavilion Ballroom
8:15-8:30
Welcome Remarks

8:30-9:30
Keynote Address “Digital Sustainability: How Carbon's Light Synthesis Can Usher in a New Level of Societal and Environmental Benefits" presented by Joesph DeSimone, CEO & Co-Founder, Carbon, Inc.

Plaza Foyer
9:30-9:45
Networking Break

Hilton Portland Downtown
Atrium Ballroom

Providing Guidance for a Wide Distribution & Implementation of Green Chemistry to Developing Countries Brainstorming Workshop

P. Coish, K. Mellor, *Organizers*
P. T. Anastas, *Organizer, Presiding*

9:45 Introductory Remarks.

9:50 1. How to raise global awareness and disseminate green chemistry on a global scale. **P.T. Anastas**, K. Mellor, P. Coish

11:10 2. How chemists are using Green Chemistry to solve sustainability challenges in your region. **P.T. Anastas**, K. Mellor, P. Coish

Hilton Portland Downtown
Broadway l/ll

Bidirectional Communication in the Electronics Supply Chain to Drive Green Chemistry

L. T. Kenny, M. Kirschner, *Organizers, Presiding*

9:45 Introductory Remarks.

9:50 3. 20 Years of the 12 Principles. **J.C. Warner**, **P.T. Anastas**

10:30 4. The role of Green Chemistry and Engineering in the semiconductor technology roadmap, International Roadmap for Devices and Systems (IRDS). **L.T. Kenny**, S. Moffatt, D. Harman

10:50 5. Sustainable semiconductor manufacturing through process modeling and optimization. **F. Shadman**

11:10 6. 2017 iNEMI sustainable electronics roadmap and action plan. M. Chalkley, **C.A. Handwerker**, L.T. Kenny, P. Gordon

11:30 8. Effective decision making, strategic thinking and systems integration in driving better materials design and selection. **R.A. Francis**

11:50 Panel Discussion.

Hilton Portland Downtown
Broadway lll/lV

Decision Science for Real-World Chemical Selection

B. E. Howard, T. Kingsbury, *Organizers*
R. J. Giraud, *Organizer, Presiding*

9:45 Introductory Remarks.

9:50 9. Practical decision making for alternatives assessment. **B. Howard**

10:10 10. Using alternatives assessment to select chemicals for sustainable materials. **L. Heine**, A. Nestler

10:30 11. Achieving consent of the governed. **B. Penttila**

10:50 12. The harmonic mean in multicriteria decision analysis. **M. Wolf**

11:10 13. Integrating decision analysis into alternatives analysis: Practice and potential. **T. Malloy**

11:30 14. Better chemistry through sustainable innovation. **K. Horspool**

11:50 15. MCDA results and discussion. **B. Howard**, T. Kingsbury

12:10 16. Practical implications. **B. Howard**, R.J. Giraud

Hilton Portland Downtown
Galleria North

Transforming Consumer & Industrial Products by Material & Chemical Innovations

R. C. Buck, S. F. Echols, *Organizers*
J. Frazier, *Organizer, Presiding*

9:45 Introductory Remarks.

9:50 17. Graft polymerization of DADMAC with various initiation methods for the sustainable dyeing of cotton. **S. Salim**, M. Abed, S. Mandal, A. El Shafei

10:10 18. Eliminating textile dyeing wastewater from the cotton garment industry. **D.F. Cheng**

10:30 19. Innovation in sustainable printing. **S. Dixon**, A. Sherman

10:50 20. Design and engineering of biobased polyurethane foams from renewable feedstock for automotive applications. **S. Bote**, A. Kiziltas, D. Mielewski, R. Narayan

11:10 21. Sustainable polyester elastomers from lactones: Synthesis, properties, and enzymatic hydrolyzability. **G. De Hoe**, M. Zumstein, B.J. Tiegs, J. Brutman, K.P. McNeill, M. Sander, G.W. Coates, M.A. Hillmyer

11:30 22. The Renewal Workshop: A new kind of apparel company. **N. Bassett**

11:50 23. The detox journey: Why I regret avoiding Chemistry 101. **K. Richardson**, C. Enlow

12:10 24. Green chemistry at retail: The target diaries. **T. Flicker**

Hilton Portland Downtown
Galleria South

Chemistry in Water: Following Nature's Lead

W. M. Braje, *Organizer, Presiding*

9:45 Introductory Remarks.

9:50 25. Non-traditional approaches to chemical catalysis to sustainably achieve selective reaction pathways. **S. Handa**

10:50 26. Synthetic organic chemistry in water: Environmentally responsible & sustainable. **B.H. Lipshutz**

11:30 27. Organic chemistry in water: Applications in the pharmaceutical industry. **W.M. Braje**, D. Petkova, J. Klee, T. Lindner, K. Britze, A. Jolit

11:50 28. Alternative solvents: From a compliance-driven activity to a trigger for innovation. **F. Gallou**

Hilton Portland Downtown
Skyline l

Innovation for Bio-Based & Renewable Chemicals

D. J. Constable, A. Sehgal, *Organizers*
E. Ponnusamy, *Presiding*

9:45 Introductory Remarks.

9:50 29. Hydroxyurethane compounds from renewable plant-based raw materials. **O. Figovsky**, D. Beilin

10:10 30. Valorization of fusel oils, via mixed metal oxide vapor phase catalysis, to industrially relevant aldehydes, ketones, esters, and hydrogen. **J.O. Smith**

10:30 31. Extraction and recovery of sinapic acid from oleaginous biomass (mustard bran) as a value-added bioproduct for the cosmetic industry. **E.C. Achinivu**, A. Flourat, F. Allais

10:50 32. E-factor -conscious synthesis and critical review of 5-hydroxymethylfurfural oxidations. **C. Sutton**, E.M. Serum, M.P. Sibi

11:10 33. Libraries of green chemicals: Design, properties, and function. **C. Estevez**

11:30 34. Tandem copper-catalyzed delignification and depolymerization of lignin in raw lignocellulose. **L. Petitjean**, P.T. Anastas

11:50 35. Cyrene and its derivatives as alternatives to dipolar aprotic solvents. **A. Zhenova**, S. Shimizu, J. Clark

12:10 36. Abstract not available. **B. Tracy**

12:25pm-1:30pm
Lunch on own.

MONDAY AFTERNOON

Hilton Portland Downtown
Atrium Ballroom

Green Chemistry: Environmental Justice to Social Equity

E. J. Brush, G. Lasker, *Organizers, Presiding*

1:30 Introductory Remarks.

1:35 37. Are chemistry and social justice related? How this 'big question' was incorporated into a major's only seminar course. **J.L. Tischler**

1:55 38. Green chemistry, environmental and social justice: an integrated approach to training future chemistry professional. **S.B. Abhyankar**

2:15 39. Environmental and social justice integration into chemistry curriculum. **G. Lasker**

2:35 40. Chemistry for social justice: Considering green chemistry in the classroom. **K. Ribay**

2:55 Networking Break.

3:15 41. When is the perfect the enemy of the good? Ethical dilemmas of the precautionary principle vs. acute needs in a low-resource context. **H.L. Buckley**

3:35 42. The green chemistry education and promotion in Taiwan: Experience from Taiwan Toxic and Chemical Substances Bureau. **P. Hsiao**, Y. Hsieh, Y. Liu, S. Lin, Y. Wang, Y. Lin, H. Hsu

3:55 43. Oregon's executive order for green chemistry: A discussion of the order's implementation and environmental justice implications for greener chemistry. **S. Caldera**

4:15 44. Unexpected benefits from green chemistry: Equity and environmental justice. **E.J. Brush**

4:35 Networking Break.

4:55 45. Closing opportunity gaps with undergraduate research: Developing evaluation tools to track student success. **R. Glover**

5:15 46. Continuing the conversation: Green chemistry, equity, environmental justice - strengths, weaknesses, opportunities and threats. **E.J. Brush**, **G. Lasker**

Hilton Portland Downtown
Broadway l/ll

Bidirectional Communication in the Electronics Supply Chain to Drive Green Chemistry

L. T. Kenny, M. Kirschner, *Organizers, Presiding*

1:30 Introductory Remarks.

1:35 47. The role of roadmaps in the semiconductor and chemical industries. **B. Bottoms**

2:15 48. Intel's continued journey on supply chain green chemistry implementation for safer chemical choices. **F. Weiby**, R. Jensen

2:35 49. Finding and implementing alternatives to priority chemicals in high-end electronics. **B.M. Kobilka**

2:55 Networking Break.

3:15 50. Creating a circular economy for hard disk drives: A shared vision. **C.A. Handwerker**, W.L. Olson, M. Schaffer

3:35 51. Moving towards zero exposure of workers to toxic chemicals in the electronics manufacturing process. **J. Reece**, S. O'Brien, J. Katz

4:15 52. Sustainable functional nanomaterials and methods in electronics. **D.J. Herr**

4:35 Networking Break.

4:55 53. Utilizing green chemistry throughout the IT supply chain. **D. Widawsky**

5:15 Panel Discussion.

Hilton Portland Downtown
Broadway lll/lV

Real-World Sustainability Challenges: Incentives & Barriers to the Use of Green Chemistry in Products

A. Nestler, L. Heine, A. M. Noce, *Organizers, Presiding*

1:30 Introductory Remarks.

1:35 54. Chemical innovation: A GAO report on sustainability. **K.L. Howard**

1:55 55. New TSCA and green chemistry innovation. **R. Engler**

2:15 56. Can tribal exposures under new-TSCA finally drive adoption of green alternatives for PBTs? **D. Barton**

2:35 57. Washington State dry cleaning industry profile: Exploring incentives toward safer cleaning methods. **M. Perkins**

2:55 Networking Break.

3:15 60. Hazard and life cycle aspects of green chemistry metrics for alternatives assessment. **E.M. Griffing**, M. Overcash, **H. Plugge**

3:35 59. Challenges and drivers relating to chemical hazards in consumer product design: Case studies. **K. Reid**, T. Lewandowski, D. Skall, R. Mattuck, M. Peterson

3:55 58. Maximizing bio content of epoxy resins for use in composites. **J. Gotro**, J. Puracal

4:15 61. Sustainable Procurement Policies and Practices Incentivizes Green Chemistry in Products. **R. McFadden**

4:35 Networking Break.

4:55 62. ChemSec Marketplace: B2B dating site to promote Green Chemistry solutions. **S. Haider**, J. Ligthart

5:15 63. Incentivizing adoption of green chemistry approaches in IT via standards and federal procurement. **H. Elwood**

5:35 64. Safer Made: A new venture capital fund investing in safer alternatives to toxic chemicals. **M. Mulvihill**

Hilton Portland Downtown
Galleria North

Greener Design in the Pharmaceutical Industry: From Discovery to Commercial Processes

J. C. Colberg, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 65. Implementation of green chemistry early in the portfolio: Insights from a medicinal chemistry perspective. **D.T. Richter**

2:00 66. Leveraging the power of continuous flow processing in pharmaceutical process development. **T. Braden**, M. Johnson, S.A. May

2:25 67. Green chemistry principles driving product sustainability. **B. Dillon**

2:50 Networking Break.

3:10 68. Importance of green metrics in internal and external process development of drugs. **F. Roschangar**

3:35 69. Green by design pharmaceutical decision analysis made possible by a data science framework. **J. Li**, J. Albrecht, A. Borovika, M.D. Eastgate

4:00 70. Predictive toxicology tools for green drug development. **J. Cohen**, T. Lewandowski

4:25 Networking Break.

4:45 71. Evolution for green: Asymmetric synthesis of vibegron for the treatment of overactive bladder. **F. Xu**

5:10 72. Green chemistry for global health: Process intensification strategies for API manufacturing. **K. Belecki**

5:35 73. Sustainable chiral resolution. **N.A. Vaidya**

Hilton Portland Downtown
Galleria South

Achieving Sustainable Products through Molecular Design with Reduced Toxicity

K. Mellor, *Organizer*
P. Coish, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 74. Molecular Design Research Network Panel: What have we learned? **P.T. Anastas**, A. Voutchkova, B.W. Brooks, E. Gallagher, T.J. Kavanagh, N. Simcox, J.B. Zimmerman

2:15 75. Design of environmentally friendly catalysts: Ethylene epoxidation on a mesoporous metal-substituted silica heterogeneous catalyst. P.D. Patel, B.B. Laird, **W.H. Thompson**

2:35 76. A Perspective and a New Integrated Computational Strategy for Skin Sensitization Assessment. V.M. Alves, S. Capuzzi, R.C. Braga, J. Borba, A. Silva, T.H. Luechtefeld, T. Hartung, C.H. Andrade, E. Muratov, **A. Tropsha**

2:55 Networking Break.

3:15 81. A low temperature metal oxide nanocrystal synthesis for producing high quality materials with applications in water purification and magnetic media. **S. Cooper**, J.E. Hutchison

3:35 78. Modeling the complex relationships between chemical properties, adaptive response, and oxidative stress. **F. Melnikov**, P. Petrovic, M. Mills, A. Voutchkova, J. Kostal, D. Botta, J. Corrales, T.J. Kavanagh, E. Gallagher, B.W. Brooks, P.T. Anastas

3:55 79. Reshaping tools of computerized drug discovery to design safer and functional chemicals. **J. Kostal**

4:15 80. Engineering green plasticizers as phthalate substitutes: From benchtop to production. **R. Jamarani**, O.G. Valdez, R. Leask, M. Maric, J. Nicell

4:35 Networking Break.

4:55 77. *In vitro* and *in silico* data for molecular toxicology: Green toxicology for green chemistry. **A. Maertens**, H. Plugge

5:15 82. One-step assembly of organophosphorus hydrolase and affinity peptide on phage and its application on biosensor. **A. Chen**

5:35 83. Design and synthesis of novel tyrosine derivatives as dual 5-LOX /COX-2 inhibitors. **P. Ayarivan**, U. Appavoo, I. Navabshan

Hilton Portland Downtown
Skyline l

Industrial Applications of Green Chemistry & Engineering Principles

E. Ponnusamy, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 84. Finding nature-inspired alternatives to PFASs in durable water repellency (DWR): an academic/industry approach. **T. McKeag**

1:55 85. "Greener solutions" and "PFCs of environmental concern". **B.J. Henry**

2:15 86. Development of an eco-friendly biotransformation protocol for valorization of food industry waste for commercial application in consumer products. **N. Mexia**, M. Benohoud, C.M. Rayner, R.S. Blackburn

2:35 87. Sustainable dyeing of cotton: Graft-polymerization of AOETMAC to achieve ultra-deep black shades without salt or alkali. **M. Abed**, S. Salim, S. Mandal, A. El Shafei

2:55 Networking Break.

3:15 88. Assessment of modernized chromatographic methods for a greener tomorrow from a global perspective. **M.B. Hicks**, L. Lehmann, W.P. Farrell, C.M. Aurigemma, J. Xu, R. Dermenjian

3:35 89. Green chemistry innovation in chemiluminescent conjugate manufacturing processes. **J. Grote**

3:55 90. Green chemistry impacts on environmental media. **S.D. Gaona**, A. Lew

4:15 91. Sustainability at an enterprise level: Focusing greening of the value chain. **H. Plugge**

4:35 Networking Break.

4:55 92. Single-step co-synthesis of methanol, dimethyl ether and dimethyl carbonate from biomass-derived syngas. P. Sripada, **A. Parihar**, S. Bhattacharya

5:15 93. Cl_2-free production of ethylene dichloride and propylene oxide. **J. Hauck**, M. Leclerc

5:35 94. Recycling metal swarf by extraction of cutting oils with supercritical CO_2. **R. Schlake**, A. Kaziunas

Skyline 1/2
6:30pm-8:00pm
Welcome Reception

TUESDAY MORNING

Plaza Foyer
7:30-5:00
Registration

Pavilion Ballroom
7:15-8:15
Networking Breakfast

Plaza Foyer
8:00-5:00
Exhibits

Pavilion Ballroom
8:15-8:30

Welcome Remarks

8:30-9:30
Keynote Address “Electrochemical Pathways towards Sustainability” presented by Donald R. Sadoway, John F. Elliott Professor of Materials Chemistry in the Department of Materials Science and Engineering at the Massachusetts Institute of Technology

Plaza Foyer
9:30-9:45
Networking Break

Hilton Portland Downtown
Atrium Ballroom

Interactive Discussion

Implementation Strategies for Greener Chemistry in Products: What are the Barriers, Opportunities, & Key Elements for Making Sustainable Consumer Goods?

J. Frazier, *Organizer*

Hilton Portland Downtown
Broadway l/ll

Interactive Discussion

Minimizing Ecotoxicity & Persistence in Chemicals & Materials

R. L. Tanguay, A. Voutchkova, *Organizers*

Hilton Portland Downtown
Broadway lll/lV

Interactive Discussion

Building Green Businesses

M. Mulvihill, *Organizer*

Hilton Portland Downtown
Galleria North

Interactive Discussion

Systems Chemistry: An Introduction to Systems Thinking in Green Chemistry Education, Research & Innovation

J. E. Hutchison, *Organizer*

Hilton Portland Downtown
Galleria South

Interactive Discussion

Metrics: Advances & Limitations in Determining the Greenness of Drug Manufacturing

F. Roschangar, *Organizer*

9:45 Introductory Remarks.

9:50 95. Green Chemistry Metrics – Yes, you need more than one! **D.J. Constable**

10:00 Interactive Discussion.

10:30 96. Inspiring process innovation via an improved green manufacturing metric: iGAL. **A. Smith**

10:40 Interactive Discussion.

11:10 97. Non-mass based metrics: Assessing environmental, health and safety impacts of chemical processes. **E. Simmons**

11:20 Interactive Discussion.

11:40 98. Metrics for medium-sized drugs: Polypeptides and oligonucleotides. **M.E. Kopach**

11:50 Interactive Discussion.

12:15 99. Streamlined PMI-LCA (Process Mass Intensity - Life Cycle Assessment) tool for small molecules. **S. Robaire**

12:25 Interactive Discussion.

12:55 Wrap-up and Next Steps.

Hilton Portland Downtown
Skyline l

Interactive Discussion

Beyond Actives: Increasing Personal Care Product Sustainability by Holistic Design

R. S. Blackburn, *Organizer*

12:30pm-1:30pm
Lunch on own.

TUESDAY AFTERNOON

Hilton Portland Downtown
Atrium Ballroom

Educational Initiatives in Sustainable Polymers & Materials

Financially supported by NSF-CCI Center for Sustainable Polymers, NSF-CCI Center for Sustainable Nanotechnology
M. T. Wentzel, J. E. Wissinger, *Organizers, Presiding*

1:30 Introductory Remarks.

1:35 100. Catalytic coupling of epoxides and carbon dioxide: Developing a laboratory experiment for undergraduates utilizing mild conditions. **S. Poland**, T. Downs, J. McLemore, Z. Ni

1:55 101. Using a biodegradable polymer for oil spill cleanup, a laboratory experiment. **J.A. Byers**, M.S. Thompson, J.E. Wissinger, R. Andrisen, M.P. Crockett, M. Qi, T.M. Rayder

2:15 102. Using polymer semiconductors and a 3-in-1 plastic electronics STEM education kit to engage students in hands-on sustainable materials activities. J.E. Wissinger, **M.G. Walter**

2:35 103. Carbon dots: A modular activity to teach fluorescence and nanotechnology at multiple levels. **A.C. Mensch**, **M.J. Gallagher**, E.R. Caudill, N. Hudson-Smith, D. Jones, M. Krause

2:55 Networking Break.

3:15 104. Synthesis of renewable bioplastics and degradation studies using food dye. **J.E. Wissinger**, Z. Tolstyka, C. Knutson, A. Hilker, A.L. Perkins, C. Anderson, R.T. Mathers

3:30 105. Investigation of properties of ionic and molecular compounds. **J.P. Lanorio**, J.G. Lanorio

3:45 106. GRASPing polymers and materials for green chemistry education. **G.A. Hurst**, A. Matharu, J. Clark

4:05 107. Biogenic systems in nanotechnology education and research. **S.L. Wallen**, M. Biryukova, I. Biryukova, L. Wemple

4:20 108. The importance of teaching systems thinking and the role that green chemistry can play. **T. Holme**, P.G. Mahaffy

Hilton Portland Downtown
Broadway l/ll

Commercial Applications of Biobased Monomers for the Polymer Industries

S. Papke, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 109. Investigation and development of biobased phenol and aniline as raw materials for building industrial polymers. **D.S. Wardius**

1:55 110. Renewable superabsorbent polymers (Bio-SAP) and other acrylate-based chemicals from renewable acrylic acid (Bio-AA) produced via the dehydration of lactic acid. **D.I. Collias**, J. Godlewski, J.E. Velasquez, P. Dziezok, M. Kehrer, J. Nagengast, J. Kadar, N. Taccardi, J. Albert, P. Wasserscheid

2:15 111. Biofene™, a new, renewable monomer for elastomer materials with novel properties. **D.J. McPhee**

2:35 112. Deep eutectic solvent extraction of phenolics compounds from rapeseed meal and biopolymer production from residual lignocellulosic hydrolysate. **P. Wongsirichot**, **J. Winterburn**, **M. Gonzalez-Miquel**

2:55 Networking Break.

3:15 113. Scaling the divide: Unlocking the value of digital biology. **T. Staub**

3:35 114. Entrepreneurship: An important "learning" for scientists & engineers in the BioPlastics Space: Experiences of a faculty entrepreneur. **R. Narayan**

3:55 Panel Discussion.

Hilton Portland Downtown
Broadway lll/lV

Developing Products for a More Sustainable Future

K. Johnson, *Organizer*
D. J. Constable, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 115. Advancing innovation of green chemistry ingredients for formulated products. **K. Johnson**

1:55 116. Enhancing cleaning-product formula sustainability. **T.J. Burns**

2:15 117. Consumer product preservation: Sustaining product microbial quality in a dynamic environment. **C. Pettigrew**

2:35 118. Safety by design. **C. Barton**, T. McGrath

2:55 Networking Break.

3:15 119. Mechanical properties and release rates of cinnamon oil infused into PLA and Waxy starch for single-serving cups. **V.L. Finkenstadt**, K. Hornback, L.A. Morrical

3:35 120. Furan esters: Safe, renewable and effective substitution to hazardous solvents, coalescers and plasticizers. **A. Cahana**

3:55 121. Highly flame-retardant polyurethanes using vegetable oils for sustainable future. **R. Gupta**, S.D. Bhoyate

4:15 122. Green approach towards molecular gelator synthesis for aesthetic modulation in oleogels. **M. Samateh**, S.S. Sagiri, R. Sanni, G. John

Hilton Portland Downtown
Galleria North

Emerging Technologies to Enable Sustainable Organic Synthesis: Special Organic Chemistry Student Session

D. K. Leahy, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 123. Pd-catalyzed γ-C(sp^3)–H arylation of free amines using a transient directing group. **Y. Chen**, J. Yu

1:55 124. Harnessing the catalytic capabilities of a bioinspired cobalt complex: A nature inspired methodology to green processes. **A. Forney**

2:15 125. Subensemble determination of molecular catalyst activity for future design of sustainable catalysts. **Q.T. Easter**, S.A. Blum

2:35 126. Atom-economical secondary amine and imine synthesis through amine dehydrogenation. **D. Ainembabazi**, A. Voutchkova

2:55 Networking Break.

3:15 127. Development of an iron-catalyzed Suzuki-Miyaura cross-coupling reaction between alkyl halides and unactivated aryl boronic esters. **M. Crockett**, C.C. Tyrol, A.S. Wong, J.A. Byers

3:35 128. Visible light mediated oxidation of benzylic sp^3 C–H bonds using catalytic 1,4-hydroquinone, or its biorenewable glucoside, arbutin, as a pre-oxidant. **L. Finney**, L. Mitchell, C.J. Moody

3:55 129. Novel Povarov-type reaction of *N*,*N*-dimethylaniline *N*-oxides. **T.S. Bush**, G.P. Yap, W.J. Chain

4:15 130. Synthesis of *Z*- or *E*-trisubstituted allylic alcohols and ethers with a Ru catechothiolate catalyst. **Z. Liu**

Hilton Portland Downtown
Galleria South

Supplanting Petroleum with Renewable Carbon

A. D. Sutton, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 131. Techno-economic analysis: Understanding research drivers to the cost-efficient production of bio-derived fuels and chemicals. **M. Biddy**

2:15 132. Targeting petroleum replacements using bio-derived feedstocks. **C.M. Moore**, O. Staples, W.L. Kubic, T.A. Semelsberger, A.D. Sutton

2:35 133. CO_2 and glycerol to formic and lactic acid using homogeneous and site-isolated heterogeneous catalysts. **A. Voutchkova**

2:55 Networking Break.

3:15 134. New routes to high cetane fuels derived from biosynthetic methyl ketones and alcohols. **B.G. Harvey**, M.J. Siirila, K. Harrison, M. Zeng

3:35 135. Petroleum blendstocks from wastewater treatment sludge: A techno-economic and GHG analysis. **A. Padmaperuma**, L. Snowden-Swan, T. Seiple, Y. Zhu, M. Bearden, S.B. Jones, J. Billing, A.J. Schmidt, K.O. Albrecht, R.T. Hallen, D.B. Anderson, C. Drennan

3:55 136. Renewable diesel fuel via catalytic upgrading of anaerobic acids. **D. Vardon**, X. Huo, N. Cleveland, J. Stunkel, A. Starace, P. St. John, S. Kim, R.L. McCormick

4:15 137. Supply chain analysis for advancing sustainable carbon recovery from livestock waste. **G.J. Ruiz-Mercado**, A.M. Sampat, V.M. Zavala

Hilton Portland Downtown
Skyline l

Continuous Processing: An Enabling Technology for Green Chemistry

C. D. Papageorgiou, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35 138. Continuous flow synthesis enabling green chemistry processes. **K.F. Jensen**

2:15 139. Maintaining quality and sustainability of a late-phase clinical candidate through a continuous process. **J. Lim**

2:35 140. Development of a safe and high-throughput continuous manufacturing approach to *N*-(2-hydroxyethyl)thiomorpholine dioxide. **N. Strotman**

2:55 141. Process intensification challenges and solutions. **J. Salan**

3:15 142. Enz-Flow: Towards continuous processing/bioprocessing of levomilnacipran. **A.C. Evans**

3:35 143. Development of a continuous slurry reaction cascade and the application of PAT in the integrated continuous manufacturing of small molecule pharmaceuticals. **S. Born**

3:55 144. Development of flow reactions to enable synthesis and medicinal chemistry. **A.B. Beeler**

Hilton Portland Downtown
Pavilion Ballroom

Green Chemistry & Engineering Product Showcase

R. S. Blackburn, J. Frazier, *Organizers*
4:35 - 6:35

145. Patagonia's approach to green chemistry innovation. **L. Hoch**

147. Nature's amazing chemistry: extraction from sustainable sources and application in consumer hair products. **R.S. Blackburn**, C.M. Rayner, M. Benohoud

148. Biobased and compostable plastic film and molded products: From academia to commercialization. **P. Giri**, S. Manjure, R. Narayan

149. Polymerization of plant oils for use in roofing and other construction applications. **D.A. Stone**

150. Zelan™ R3: The first renewably sourced durable water repellent textile finish. **R.C. Buck**

151. Grow bioplastics: A naturally degradable and compostable lignin-based biopolymer platform. **T. Bova**, J. Beegle

152. Mainstreaming green chemistry: Recent green product launches from P&G. **W.C. Shearouse**

153. Sironix renewables: Eosix™ surfactant. **C. Krumm**

154. Product Showcase: Innovation in sustainable printing. **S. Dixon**, A. Sherman

156. Development of durable coatings for improved sustainability. **S. Lee**

157. Product Showcase: Eliminating textile dyeing wastewater from the cotton garment industry. **D.F. Cheng**

158. ChemSec Marketplace: Showing your Green Chemistry solutions can have multiple impacts. **J. Ligthart**, S. Haider

159. CYRENE™: A new bio-based dipolar aprotic solvent. **J. Murray**, J. Clark, T. Duncan

161. Roadmap to DMF-free materials for Apparel and Lifestyle industry. **S. Blos**, A. Schieke

164. Paint remooble: Fast, easy to use, non-flammalbe and non-toxic paint removers. **B. Engendahl**, T. Fennelly, M. Beernaert

Hilton Portland Downtown
Pavilion Ballroom

Green Chemistry & Engineering Poster Session

R. S. Blackburn, J. A. Haack, *Organizers*

4:35 - 6:35
4:35-5:35 – Even numbered posters presented
5:35-6:35 – Odd numbered posters presented

165. Harnessing the catalytic capabilities of a bioinspired cobalt complex: A nature inspired methodology to green processes. **A. Forney**, H.R. Lucas

166. Continuous hot-dip metalizing of steel and copper products. **J.E. Sabol**, A. Belskis

168. Reaction kinetics and pathways of fatty acid hydrothermal decarboxylation on supported metal oxides nanoparticles catalysts. **J. Bian**, J. Li, c. li

171. Phosphorus recovery of organphosphate pesticides using solution and supported molybdates. **S. Bokouende**, L.Y. Kuo

173. A tiered approach to chemical screening. **S. Dubrow**, B. Howard, S. Risotto, W.F. Carroll, W. Greggs, B. Landenberger

174. The future of dye transfer in laundry: Providing industry relevant insights for more sustainable consumer practices. **L. Cotton**, R.S. Blackburn, A. Hayward

175. Schiff base mosquito repellents derived from common botanical sources. **R.M. Bouldin**, A.E. Kiszewski, S. Wu, A. Riveroll Usabiaga

176. Characterisation and differential cross-section study of sustainable cellulose II/cellulose acetate hybrid fibres for controlled drug delivery products. **N. Tulos**, D. Harbottle, P. Goswami, R.S. Blackburn

177. Temperature and frequency: coarse and fine control of energy in lab-scale mechanochemistry. **J.M. Andersen**, J. Mack

178. Natural-based solidifiers for oil spill containment and recovery. **F. Lopes Motta**, S. Stoyanov, Y. Zhang, J.B. Soares

180. Synthesis and characterization of biogenic selenium nanoparticles with antimicrobial properties made by *Staphylococcus aureus*, Methicillin-resistant *Staphylococcus aureus* (MRSA), *Escherichia coli* and *Pseudomonas aeruginosa*. **D. Medina Cruz**, T. Webster, G. Mi

181. Developing a green alternative solution for *in vitro* dissolution of long-acting parenterals. **M.A. Mackey**, H. Balderhaar, B. Pierce, L. Li, S.E. Barrett, M. Marauli, R.M. Helmy, P. Wuelfing

182. Hydroformylation with subsequent catalyst recovery via thermomorphic multiphase systems: Process intensification in miniplant scale. **K.U. Kuennemann**, D. Vogt, J.M. Dreimann

183. Aromatics from propane or alcohols by using CO_2 as enhancer. **S. Park**

184. Functionalization of renewables in an aqueous solvent system. **J. Bianga**, T. Gaide, T.A. Fassbach, J.M. Dreimann, D. Vogt, T. Seidensticker

188. High-throughput, continuous flow synthesis of nanoparticle catalysts as a safe and sustainable nanomanufacturing method. **E.J. Roberts**, L. Wang, N. Malmstadt, R.L. Brutchey

189. Amine and alcohol activation reactions in flow using heterogeneous Pd-doped catalysts. **A. Voutchkova**, D. Ainembabazi

190. Identifying green chemistry dissemination and implementation challenges in India and potential collaborative opportunities. **N. Mehta**

191. Product safety in green and innovative product design with bitter aversive technology. **K. Cordz**, M. Tracy

192. Modular, tunable, and sustainable generation of π-allylpalladium chloride catalysts. **S. Vemula**, D. Kumar, G.R. Cook

193. Selecting green chemical alternatives (solvents and reagents) based on the project specific requirements. **N. Vaidya**

195. Synthetic routes to silicone-modified soybean oil copolymers. **C.B. Gale**, D. Graiver, M.A. Brook

196. Greener and selective synthesis of vanillin from lignin. **S.C. Patankar**, S. Ayakar, V.G. Yadav, S.H. Renneckar

197. Organocatalyzed atom transfer radical polymerization as a tool for functional polymer design and production. **B. Buss**, G. Miyake

198. Studies on the interaction between artificial co-enzyme based on diphenylviologen derivative and malic enzyme for CO_2 utilization. **T. Katagiri**, S. Ikeyama, Y. Amao

200. Synthesis of chiral amines via late transition metal catalysis. **Z. Relethford**, J. Reynolds, C.A. Caputo

201. Thermo-catalytic conversion of biomass to 5-Chloromethyl furfural and Levoglucosenone in fluidised bed reactor: A scalable and commercially viable process for green platform chemicals. **A. Parihar**, G. Garnier, S. Bhattacharya

202. Polyurethanes synthesized from the digestion of polycarbonates via aminolysis process. **C. Wu**, L. Chen, R. Jeng, S. Dai

203. Synergistic toxicity of surfactant/nanoparticle mixtures: Understanding and mitigating nanoparticle formula hazards. **A.L. Ginzburg**, L. Truong, R.L. Tanguay, J.E. Hutchison

205. 2-hydroxyethylammonium acetate: An efficient and green ionic liquid for the selective synthesis of pyrazolodihydro pyridines derivatives via multi-component reaction pathway. D.M. Patel, M.G. Sharma, R. Vala, **H.M. Patel**

206. Professional development and research applicability for chemists to increase reach to specific audiences. **T.G. Tucker**, M.M. Cheatham

208. Green chemistry with supported molybdenum(VI) peroxide complexes. **K. Inoue**, L.Y. Kuo

209. Lipase catalyzed epoxidation of fatty acid methyl esters derived from unsaturated vegetable oils in absence of carboxylic acid. **D. Chavez-Flores**, A. Camacho-Davila, V. Ramos-Sanchez, J. Espinoza-Hicks, A. Sustaita

210. Solid-state reactions: A green methodology for selective synthesis of atropoisomers. **m. sharafi**

211. Process optimization for maximizing the rheology modifying properties of pectic hydrocolloids recovered from steam exploded biomass. **R.G. Cameron**, C. Dorado, J.A. Manthey

212. Lewis acid catalyzed addition of benzophenone imine to epoxides enables the selective synthesis of primary 1,2-amino alcohols. **J. Lim**, D. Leitch

213. Sustainable content uniformity sample preparation: Analytical robotics laboratory. **E. Hein**, E.A. Mularz, J. Everitt, K. Gallagher, D. Lavrich

214. Towards a more sustainable synthesis of indolequinones. **T. Dias**, C.J. Moody

215. Green superhydrophilic-superoleophobic membranes for oil-water separation. **Z. Ashrafi**, L.A. Lucia, w. krause

216. Production of polyfructan and polyester by tandem fermentation using sugarcane juice as starting feedstock. **I. Shih**, F. Wu, W. Li

217. Coatings, composites and foams: A novel approach to creating functionalized Kraft lignin resins. **E. Krall**, D.C. Webster

218. Production of paints from natural resins locally sourced from agricultural raw materials. **A.I. Okewole**

219. Synthesis of bio-derivable reactive diluents for styrene replacement in sustainable polymers. **A.C. Renner**, E.M. Serum, M.P. Sibi

220. *N*-demethylation made easy: A biocatalyst from the poppy microbiome with broad substrate specificity. **M. Augustin**, J. Augustin, N. Grobe, T. Kutchan

221. Reversible hydration of carbonyls enable a novel method of water desalination. **N.A. Tavenor**, E.J. Beckman

222. Novel method for a one-pot, green synthesis of isoxazolines using SDS. **I.S. Lopez**, D.M. Solano

223. Structural elucidation of valorized-lignin: Acetoacetylation of simple model compounds and lignin. **E.M. Serum**, E. Krall, D.C. Webster, M.P. Sibi

224. Innovations in replacing highly hazardous solvents using Hansen Solubility Parameters theory. **A. Giarrosso**, G. Morose

225. Green organic chemistry & course based undergraduate research. **M. Hunsen**

226. Naturally occurring exudates gums as ecofriendly inhibitors for Mild Steel corrosion in acidic medium. **D.N. Onukwube**

227. Carbon dioxide mediated transesterification for the production of enhanced FAME profiles. **L. Soh**, T.A. Kwan, M. Mitchell, J.B. Zimmerman

228. Biodegradable mulch films for agriculture applications. **S. Irmak**, S. Wortman, L. Isom

229. I-Hazard and risk assessment in alternatives assessment. **H. Plugge**, E.M. Griffing, M. Overcash

230. II-LCA in Alternatives Assessment. E.M. Griffing, M. Overcash, **H. Plugge**

231. High throughput screening of green chemicals: Data interpretation for hazard assessment. P.A. Raya, N. Das, **H. Plugge**

232. Lignin as a feedstock for stereolithography. **S.C. Chmely**, D.P. Harper, K. Rajan, J. Sutton

233. Towards a shared understanding of green chemistry: Developing an assessment tool to measure green chemistry understanding and values. **L.B. Armstrong**, M.C. Douskey, A.M. Baranger

235. US EPA's EPISuite™ BIOWIN biodegradation models and designing for degradation. **L. Cassidy**, M. Kawa

236. Coacervates as efficient reactor systems for the breakdown of hazardous organic compounds. D. Rivera, **C. Kaiser**

237. Systematic approach for integrating indoor chemical exposures into building materials LCA. L. Huang, N.D. Anastas, **P.P. Egeghy**, D.A. Vallero, O. Jolliet, J. Bare

238. Accelerated development of green chemistry through atomic scale simulation. **T.J. Mustard**, C.M. Krauter, H.S. Kwak, A. Goldberg, M. Halls

239. Hybrid shrub-willow biomass as a potential raw material for platform molecules. **A. Freiburger**, D.G. Kovacs, J.J. Krikke, E. Nordman

240. SCHB assists innovators and entrepreneurs in the chemistry enterprise. **J.E. Sabol**

241. A continuous growth synthesis method enables fine control of size and structure of metal oxide nanocrystals enabling the tuning and enhancement of properties. **L.K. Plummer**, S.R. Cooper, A.W. Jansons, B. Crockett, A. Smith, K.M. Koskela, P. Lenox, A. Jander, P. Dhagat, J.E. Hutchison

242. "PMI Calculator": A new predictive analytics web application to guide greener synthetic design. **A. Borovika**, J. Li, J. Albrecht, M.D. Eastgate

243. Biorenewable resources: Engineering new products from marine diatoms. **P. LeDuff**, G.L. Rorrer

244. Application of transition metal dichalcogenides to produce fuel and high-value chemicals from bio-renewable feedstocks. **E. Ahmad**, **S. Quereshi**, K.K. Pant, S. Dutta

245. Development of a greener process for GSK2132838A. **Q. Dai**

246. Green Chemistry: As a sustainable pathway for mankind in the 21st century. **T. Orimogunje**

247. Heterogeneous catalysis in flow: Green chemistry in practice at ThalesNano. **E. Dudás**

248. Electroactivated alkylation of amines with alcohols via borrowing hydrogen methodology. **B. Appiagyei**, S. Bhatia, J.E. Jackson, G. Keeney

249. Communicating sustainable nanotechnology through the sustainable nano blog. **E.R. Caudill**, N. Hudson-Smith

250. Production of biomass-privileged high-density jet fuel in biphasic catalytic process. **H. Lin**

251. Silicone/saccharide composites using thiol-ene "click" chemistry. **S. Zheng**, M.A. Brook

252. Vanillin-crosslinked dynamic silicone elastomers. **R. Bui**, M.A. Brook

253. Functional silicone-cellulose hybrid nanocomposites derived from thioacetals. **A. Fatona**, J. Moran-Mirabal, M.A. Brook

255. Safer synthesis of a sulfonated rhodamine dye. **S. Corry**

256. Exploring bio-derived building blocks for simultaneous production of fuels and chemicals. **O. Staples**, C.M. Moore, W.L. Kubic, T.A. Semelsberger, R. Jenkins, A.D. Sutton

257. Sustainable cellulose solubilization and derivatization in a DBU/CO_2 switchable solvent. **K.N. Onwukamike**, E. Grau, S. Grelier, H. Cramail, M. Meier

258. A Study of the tensile strength properties of starch and cinnamon leaf lssential oil blends. **L.A. Morrical**, V.L. Finkenstadt

6:45-9:00
Atrium Ballroom
7th Annual ACS GCI Industrial Roundtable Poster Reception (invitation only)

7:00-9:30
Broadway
Performing Art of Science Workshop (pre-registration required)

WEDNESDAY MORNING

Hilton Lobby
5:45
Fun Run/Walk

Plaza Foyer
7:30-3:00
Registration

Pavilion Ballroom
7:15-8:15
Networking Breakfast

Plaza Foyer
8:00-3:00
Exhibits

Pavilion Ballroom
8:15-8:30
Welcome Remarks

8:30-9:30
Keynote Address presented by Julie Zimmerman, Professor & Senior Associate Dean of Chemical & Environmental Engineering Forestry & Environmental Studies at Yale University; Deputy Director for the Yale Center for Green Chemistry & Green Engineering

Plaza Foyer
9:30-9:45
Networking Break

Hilton Portland Downtown
Atrium Ballroom

Green Chemistry Innovations in the Classroom: Rapid Fire Session

M. T. Wentzel, J. E. Wissinger, *Organizers, Presiding*

9:45 Introductory Remarks.

9:50 259. Preparation and analysis of self-healing hydrogels in the chemistry teaching lab. **M.T. Wentzel**, P. Willoughby, A. Hilker, T. Mattice, R. Morris

10:00 260. Sustainability and biological perspectives: A coherent curriculum for the organic chemistry instructional lab. **G. Friestad**

10:10 261. Redesigning the Organic Chemistry II laboratory to teach green chemistry principles. **N.F. Blank**

10:20 262. Integrating Green Chemistry and Chemical Hazard Awareness into General Chemistry Labs. A.S. Cannon, **D. Ward**

10:30 263. From research to the teaching labs: Crafting research inspired laboratory projects for general chemistry laboratories using undergraduate students as active participants in the design optimization and implementation of an electrochemistry water remediation project. **V. Lykourinou**, E. Navarrete, J. Perrier, L. Rajic

10:40 Panel Discussion.

11:00 264. Implementing a circular economy paradigm in introductory laboratories. **S.L. Wallen**, L. Wemple, B. Collins, T. Kelly

11:10 265. Cleaner alkenes. **A. Weissfloch**

11:20 266. Connecting green chemistry topics to the Anchoring Concepts Content Map. **T. Holme**

11:30 267. A template for constructing green chemistry related content that promotes systems thinking opportunities for students. **T. Holme**, J.E. Hutchison, J.A. Haack, M.M. Kirchhoff, D.J. Constable, J. MacKellar

11:40 Panel Discussion.

Hilton Portland Downtown
Broadway l/ll

Green Chemistry & Engineering for Peptides, Oligos & ADCs

M. E. Kopach, *Organizer, Presiding*

9:45 Introductory Remarks.

9:50 268. Prospects for the chemical manufacture of protein pharmaceuticals by modern ligation methods. **S. Kent**

10:30 269. Scope and limitations of solid-phase peptide synthesis in the green ecosystem. **F. Albericio**, A. Kumar, Y.E. Jad, J. Collins, B.G. de la Torre

11:10 270. GAP chemistry for the synthesis of amines and peptides. **G. Li**

11:50 271. CEPS technology: A more efficient and greener route to peptide drugs. **M. Schmidt**, A. Toplak, J. van Maarseveen, T. Nuijens

12:10 272. Macrocyclic peptide inhibitor of PD-L1: Process development perspective. **S. Mukherjee**

Hilton Portland Downtown
Broadway lll/lV

Accelerating Development of Sustainable Products & Processes through Start-Ups and SMEs

L. M. Reyes, P. D. Thornton, *Organizers, Presiding*

9:45 Introductory Remarks.

9:50 273. Beyond discovery: Commercialization of green chemistry at InKemia Green Chemicals. **L. Zarama**

10:30 274. Renewable chemical development from academia to start-up. **C. Krumm**

10:50 275. Chemistry based entrepreneurship: Lessons learned & untapped opportunities. **N. Mehta**

11:10 276. Introducing safe products that work: Remooble. **B. Engendahl**, T. Fennelly

11:30 277. Process intensified modular manufacturing: The economics of $_{small}$ scale. **D. McFeeters-Krone**, B. Paul

11:50 278. Commercialization of innovative green chemistry solutions. **R. Ozdemir**, J. Ornstein

12:10 Discussion

Hilton Portland Downtown
Galleria North

Towards Safer Design Strategies: Using Toxicology Tools & Concepts within Chemistry Courses & Programs

D. G. Kovacs, S. K. Van Bergen, *Organizers*
A. S. Cannon, P. Spencer, *Organizers, Presiding*

9:45 Introductory Remarks.

9:50 280. Chemical hazard resources: Where to find them and how to use them. **A. McCarthy**

10:30 281. Green chemistry and chemical hazard assessment. **M.H. Whittaker**, S. van Bergen, L. Heine

11:10 282. Overview on the use of predictive animal-free toxicology testing approaches to develop safer products. **A. Clippinger**

11:50 283. Resources and tools for integrating toxicology concepts in to chemistry programs. **A.S. Cannon**, **D.G. Kovacs**

Hilton Portland Downtown
Galleria South

Innovative Chemistry & Process Development for Sustainable Small Molecule Manufacturing

K. M. Maloney, *Organizer*
K. Maloney, *Presiding*

9:45 Introductory Remarks.

9:50 284. Sustainable manufacturing process for BTK inhibitor BMS-986195. **N. Strotman**

10:30 285. Development of a green and sustainable commercial manufacturing process. **H. Ren**

11:10 286. Development and scale-up of a continuous flow nitro group reduction in a packed bed reactor for the synthesis of an API intermediate. **M. Laurila**, M.D. Johnson, C.K. Lippelt, P. Milenbaugh, R. Cope

11:50 287. Science & innovation in API process design & continuous improvement. **S. Cui**

Hilton Portland Downtown
Skyline l

Charting the Course to Sustainable Chemistry in the Supply Chain

Workshop: Lessons Learned

Cosponsored by CEI
M. Satterfield, J. Tanir, *Organizers, Presiding*

9:45 Introductory Remarks.

9:50 288. Product stewardship: A formula for success. **H. Swei**

10:30 289. Safer products and satisfied customers. **E. Bisinger**

10:50 290. Safer chemistry in consumer products. **B. Brown-West**

11:10 291. EPA's Safer Choice Program: Navigating the chemical supply chain. **B. Williams**

11:30 Panel Discussion.

12:30pm-2:00pm
Lunch on own.

WEDNESDAY AFTERNOON

Hilton Portland Downtown
Atrium Ballroom

Green Chemistry Innovations in the Classroom: Rapid Fire Session

M. T. Wentzel, J. E. Wissinger, *Organizers, Presiding*

2:00 Introductory Remarks.

2:05 292. Green chemistry, catalysis, and information literacy. **R.J. Swails**

2:15 293. Envisioning holistic metrics for green chemistry: An introduction to the Hazard Reflection Framework for Green Chemistry Education. **M. Kile**

2:25 294. Green chemistry: Preparing students to meet the grand challenges of sustainability. **E.J. Brush**, **J.E. Wissinger**, K. Aubrecht, M. Bourgeois, J. MacKellar

2:35 295. Project Sustainable Industrial Chemistry – a sophomore project for groups of four students at the University of Twente, The Netherlands. **B. Schuur**

2:45 296. Case study: Implementing green chemistry in an undergraduate laboratory – the approach, challenges and lessons. **O. Oluwaniyi**

2:55 Panel Discussion.

3:15 Networking Break.

3:35 297. Developing written communication skills in green chemistry through children's books. **G.A. Hurst**, L. Summerton, C. Beauvais, J. Clark

3:45 298. Leveraging the GHS in green chemistry education. **R. Stuart**

3:55 299. Chemistry of Sustainable Products: A non-major course for business students. **R.M. Bouldin**

4:05 300. Maize and blue go green: A Bachelor of Science degree in green chemistry at the University of Michigan-Flint. **N.B. Kingsley**, J.L. Tischler

4:15 Panel Discussion.

4:35 Concluding Remarks.

Hilton Portland Downtown
Broadway l/ll

Bioenzymatic Approaches to Solve Activity & Selectivity Challenges in Process Development

D. Entwistle, *Organizer*
D. Entwistle, *Presiding*

2:00 Introductory Remarks.

2:05 301. Enabling drug development through biocatalytic cascade reactions. **S. Miller**

2:45 302. Recent advances in photoenzyme catalysis. **T. Hyster**

3:25 Networking Break.

3:45 303. Pseudo aldol approach to access all four diastereomers of GSK3068898A via a biocatalytic DKR. **J. Kaplan**

4:25 304. Abstract not available. **D. Entwistle**

Hilton Portland Downtown
Broadway lll/lV

Accelerating Development of Sustainable Products & Processes through Start-Ups and SMEs

L. M. Reyes, P. D. Thornton, *Organizers, Presiding*

2:00 Introductory Remarks.

2:05 305. Keracol Limited: A University spin-out making academic natural products research into a business of sustainable plant extracts for skin and hair applications. **R.S. Blackburn**

2:45 306. The future is garbage: How and why we launched a waste-to-materials startup while grad students. **T. Bova**, J. Beegle

3:05 307. The GC3 Startup Network: Accelerating development & market pull of green chemistry. J.B. Manley, **J. Tickner**

3:25 Networking Break.

3:45 308. Importance of team, value proposition and market focus in ensuring startup viability. **A. Polliack**

4:00 309. Top ten issues to consider to protect and leverage your innovations. **K.E. Bianco**, **C. Collins-Chase**

4:15 310. Chemical angel network due diligence process for sector specific investments. G. Heinrich, S. Duhovic, **M. Vreeke**

4:30 311. Discussion: Addressing the missing links to accelerate small businesses in green chemistry. **L.M. Reyes**, **P.D. Thornton**

Hilton Portland Downtown
Galleria North

Towards Safer Design Strategies: Using Toxicology Tools & Concepts within Chemistry Courses & Programs

D. G. Kovacs, S. K. Van Bergen, *Organizers*
A. S. Cannon, P. Spencer, *Organizers, Presiding*

2:00 Introductory Remarks.

2:05 312. Tools and programs utilized by third party toxicologists to generate chemical hazard assessments. **A. Labut**

2:25 313. Chemical Hazard Screening 101. **S. Risotto**, B. Howard, S. Dubrow

2:45 314. Why industry needs chemists trained in toxicology. **S. Marty**

3:25 Networking Break.

3:45 315. Predictive tools to aid in the design of low hazard chemicals and products, including a case study. **A. Maertens**

4:25 316. Application of read-across to the design of green(er) chemicals. **C. Rowlands**, S. Abraham, T.H. Luechtefeld

Hilton Portland Downtown
Galleria South

Biobased Chemicals: Beyond Drop-In Replacements

J. Cafmeyer, N. Fitzgerald, *Organizers, Presiding*

2:00 Introductory Remarks.

2:05 317. Can the biorefinery answer the question of, "What chemical should we make?" Balancing product identification with technology development. **J.J. Bozell**

2:15 318. Performance-advantaged products from biomass: Market pull and drivers to support innovative products. **M. Biddy**

2:25 319. Creating commercial markets for bioproducts in partnership with USDA. **W.J. Orts**

2:35 320. Bioprivileged molecules: A new biobased chemicals opportunity. **P. Keeling**

2:45 Panel Discussion.

3:25 Networking Break.

3:45 321. Estolides for lubricant applications. **J. Bredsguard**

3:55 322. Novel building blocks designed from metathesized vegetable oils. **F.A. Ngantung**

4:05 323. Unlocking molecular diversity to enable material innovation. **H. Chaperon**

4:15 324. Industrial applications of medium chain length poly(hydroxy alkanoates): From feedstock to finished article. **M. Mang**

4:25 325. Bio-based materials in coatings. **H. Zhou**, S. Lee, C.A. Wilson

4:35 Panel Discussion.

Hilton Portland Downtown
Skyline l

Charting the Course to Sustainable Chemistry in the Supply Chain

Workshop: Gaps, Challenges, and Needs

M. Satterfield, J. Tanir, *Organizers, Presiding*

2:00 Introductory Remarks.

2:05 326. Delivering sustainability & performance: Home & personal care of the future. **A. Sehgal**

2:20 327. Lessons learned from a novel study of cleaning product ingredients. **B.W. Brooks**

2:35 328. Abstract not available. **M.H. Wolf**

2:50 Panel Discussion.

Hotel Lobby
6:15
Green Chemistry on Tap