



CPAC Rome Workshop 2018

**March 19-21, 2018, University of Washington Rome
Center Piazza del Biscione 95, Rome, Italy 00186**

Utilization of New Concepts in Developing Next Generation Materials, as well as Exploring New Reaction Routes that Benefit from the Growing Use of Continuous Flow Technology

Rome Workshop Organizers: Ray Chrisman and Mel Koch, MK Optimization and Control LLC

Rome Workshop Advisory Steering Committee: Giancarlo Cravotto, U Turin; Claude De Bellefon, U Lyon; Ludo Diels, VITO; Frank Gupton, VCU, Volker Hessel, Eindhoven U Technology; Simone Maccagnan, Gimac Microextruders; Brian Marquardt, U Washington, Peter Poechlauer, Patheon; Kurt VandenBussche, UOP; Paul Watts, Nelson Mandela U

As the demand for sustainable materials grows, new approaches are being developed to utilize biobased materials which have very different chemistries from petrochemical feedstocks. Initially the effort was to convert biobased materials to hydrocarbon like feedstocks. However, new approaches are taking advantage of the distinct properties of biobased materials to develop new generations of platform chemicals as well as new materials with advanced properties. The meeting will add a focus on next generation materials as well as continuing to explore new reaction routes that benefit from the growing use of continuous flow technology concepts.

The evolution of flow microscale reaction technology has led to a wide range of process intensification developments in the various steps of manufacturing that result in the ability to rapidly evaluate and optimize new reaction routes as well as offering more cost effective processing. The key next step is the integration of these unit operations into end-to-end optimized continuous processes.

Presentations on industrial case studies in flow technology for manufacturing are welcomed as are advances in all phases of flow processing, which could include developments in the use of unique unit operations or chemistries for biomass processing, or the use of extruders for solventless processing, or homogeneous or nanoscale catalysis, or the integration and use of new approaches in separations and purifications in flow chemistry. In addition, presentations on new concepts in the rapidly developing area of continuous fermentation are welcomed. Since process modeling is a key part of flow chemistry, presentations on new developments in the use of process modeling to integrate and operate unit operations are also encouraged.

Advances in the use of process analytics to insure optimum performance in these developments will be presented and discussed as it offers the way to effectively integrate these advances and tie them into the new process models.

Monday, March 19, Conference Room, 1st Floor

12:00	Registration Opens
13:00	Introduction Mel Koch, CPAC/APL, University of Washington, USA
13:10	Review of the Summary and Charts from the 2017 Rome workshop and the Plan for this year's event Ray Chrisman, MK Opt and Control and Peter Poechlauer, Patheon
13:30	Welcome from the US Embassy in Rome, Italy
Session One	Examples of New Concepts to Facilitate Next Generation Processes
13:45	The Circular Economy, When Problems Become Opportunities for New Thinking in Product Development and New Ways of Production Harald Sverdrup, University of Iceland and Norsemetal, Norway
14:20	Incorporating and Substituting Operator Experience in Development of Processes - some Critical Issues Olav Kvalheim, University of Bergen, Norway
Session Two	Enabling process understanding to enable the Integration of Multiple Unit Operations for Continuous Processing
14:50	Process Analytical Technology in Biologics Cyrus Agarabi, US FDA CDER, USA
15:20	Break
15:35	University of Washington Rome Center Welcome Amity Neumeister, Director, UWRC, Italy
15:45	Introduction of Participants
16:15	The use of Extruders to make Polymer Nanocomposites Babatunde Ogunnaike, University of Delaware, USA
16:45	Hierarchical "Milli-Foam" Internals for Demanding G-L-S Chemistries Régis Philippe University of Lyon, France
17:15	Discussion: Ray Chrisman, MK Optimization and Control LLC, USA
17:30	Con Apertivo, UW Rome Center, Apartment 422, 4th Floor

Tuesday, March 20, Conference Room, 1st Floor

Session Three	Coupling Multiple Unit Operations for Continuous Processing
9:00	Introduction Mel Koch, CPAC, University of Washington, USA
9:10	Integrated Continuous Flow Processing of Fine Chemical and Pharmaceutical Products Paul Watts, Nelson Mandela University, South Africa
9:40	The Medicines For All Initiative Katherine Belecki, Virginia Commonwealth University, USA TBC
10:10	Break
10:35	Developing Process Control for Flow Chemical Reactions – Using Unique Approaches to Sampling, Sensing, and Data Handling Brian Marquardt, CPAC, University of Washington, MarqMetrix, USA
11:05	Linking the Manufacture of Pharmaceutical Ingredients to their Formulation Peter Poechlauer, Patheon, Austria
11:35	Quality-In(Process)Line (QuProLi) process intensification for a micro-flow UV-photo synthesis enabled by online UHPLC analysis Marc Escribà-Gelonch, Elnaz Shahbazali, and Volker Hesse Eindhoven University of Technology, The Netherlands and Maarten Honing, Maastricht University, The Netherlands.
12:05	Lunch, Da Pancrazio, Palazzo Pio, Ground Floor
Session Four	Process automation of coupled Multiple Unit Operations for Continuous Processing
13:30	Microfluidics with <i>In Situ</i> Raman Spectroscopy for the Characterization of Non-Polar/Aqueous Interfaces Ryan Hartman, New York University, USA
14:00	An Industrial Case Study on Continuous Flow Paul Desmond, Eli Lilly, Ireland
14:30	Multi-Spectral Fiber Spectroscopy for Remote Process Control Viacheslav Artyushenko, Art Photonics, Germany TBC
Session Five	Sampling, Sensing, and Multivariate Analysis, MVA of Large Data Sets for Optimized Process Control
15:00	Using Lab Scale Flow Chemistry for Data Acquisition and the Development of Modularity Jean-Noël Tourvieille and Flavie Sarrazon, Solvay, France

15:30	Break
15:50	Process Intensification in Bio-based Industries – particularly to Achieve Efficient Lignin Processing Ludo Diels, VITO, Belgium
16:20	Developing Technology to Convert Lignin to Useful Products Per Tomani and Peter Axegård, Rise Research Institute, Sweden
16:50	Real Time PAT Based Knowledge Management and Control in Continuous Processes Martin Gadsby, Optimal Industry Automation Ltd., UK
17:20	Discussion: Ray Chrisman, MK Optimization and Control LLC, USA
17:40	Reception Con Apertivo, UW Rome Center, Apartment 422

Wednesday, March 21, Conference Room, 1st Floor

Session Six	Advances in Process Unit Operations and Solution Providers
9:00	Introduction Mel Koch, CPAC, University of Washington, USA
9:10	Synthetic Carbon Allotropes: a Growing Family of Fascinating Architectures with Outstanding Material Properties Giancarlo Cravotto, DSTF Director (Drug Science and Technology), U Turin and ESS President (European Society of Sonochemistry), Italy
9:40	The Use of a C-3 Building Block for Preparing New Chemicals for Different Applications Maurizio Galimberti, Politecnico University, Milan, Italy
10:10	Chemical Nanotechnologies and Strategies for Sustainable Protection from the Olive Quick Decline Syndrome Giuseppe Ciccarella, U Lecce, Italy
10:40	Break
11:00	Advances in Micro-Extruders Simone Maccagnan, Gimac, Italy
11:30	Crystallization of Drug Substances: QbD and PAT application for CQAs assessment Marino Nebuloni, U Parma, Italy
12:00	The Implémentation of a Platform for Innovation Franck Baco-Antoniali, IFP and Axel One, France
12:30	Lunch

14:00	<p>Recent Advances in Valve-Based Two-Dimensional Gas Chromatography and Gas Chromatographic Sensing Chris E. Freye, H. Daniel Bahaghighat, and Robert E. Synovec, University of Washington, USA</p>
14:30	<p>The Combination of flow Chemistry and the elements of Green Chemistry Luigi Vaccaro, University of Perugia, Italy</p>
15:00	<p>Advances in the use of Single-Sided NMR magnets Michele Martin, Matt Augustine, and Michael McCarthy, University of California at Davis, USA</p>
15:30	<p>Green Chemistry Antimo Gioello, University of Perugia TBC</p>
16:00	<p>Summary and Final Discussion leading to 2018 Chart Preparation and Action Plans Ray Chrisman, MK Opt and Control and Peter Poechlauer, Patheon</p>
16:30	<p>Conclusion of Rome Workshop</p>