

# MONDAY ORAL PRESENTATIONS

June 27, 2011

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8:30 AM - 10:00 AM  
**SESSION J: Plenary**  
Green Auditorium

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\* Invited paper

SESSION J1: Plenary I  
Chair: Anil Patri  
Monday Morning, June 27, 2011  
Green Auditorium

8:30 AM  
Debra Kaiser - Information

8:40 AM  
Willie May - NIST Welcome

8:50 AM  
Anil Patri - Conference Welcome

9:00 AM  
Andrew Lovinger - Dendrimers at NSF

9:10 AM  
Piotr Grodzinski - Nanotechnology at the NCI

9:20 AM **\*J1.1**  
**Building Molecules to Image and Help Treat Cancer.** E. S. Olson<sup>1</sup>, T. A. Aguilera<sup>1</sup>, T. Jiang<sup>1</sup>, M. Whitney<sup>1</sup>, J. L. Crisp<sup>1</sup>, P. Steinbach<sup>1</sup>, L. G. Ellies<sup>2</sup>, Q. T. Nguyen<sup>3</sup> and R. Y. Tsien<sup>1</sup>; <sup>1</sup>HHMI and Department of Pharmacology, University of California-San Diego, La Jolla, California; <sup>2</sup>HHMI and Department of Pathology, University of California-San Diego, La Jolla, California; <sup>3</sup>HHMI and Department of Surgery, University of California-San Diego, La Jolla, California.

10:00 AM BREAK

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10:20 AM - 1:00 PM  
**SESSION B: Dendrimer Synthesis & Characterization**  
Lecture Room B

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\* Invited paper

SESSION B1:  
Chairs: Scott Grayson and Michael Malkoch  
Monday Morning, June 27, 2011  
Lecture Room B

10:20 AM **\*B1.1**  
**PAMAM Dendrimers For Oral Drug Delivery: Transepithelial Transport and In Vivo Tolerability.** Hamid Ghandehari<sup>1,2,3</sup>, Abhijit Ray<sup>1,2</sup>, Giridhar Thiagarajan<sup>1,3</sup>, Khaled Greish<sup>1,2</sup>, Shradha Sadcar<sup>1,2</sup> and Dallin Hubbard<sup>1,3</sup>; <sup>1</sup>Nano Institute of Utah, University of Utah, Salt Lake City, Utah; <sup>2</sup>Pharmaceutics and Pharmaceutical Chemistry, University of Utah, Salt Lake City, Utah; <sup>3</sup>Bioengineering, University of Utah, Salt Lake City, Utah.

10:50 AM **B1.2**  
**DendriGraft Poly-L-Lysine (DGL): a Highly Potent Nanometric Platform for Life Sciences Applications.** Thomas Regnier<sup>1</sup>, Helene Collet<sup>1</sup>, Auguste Commeyras<sup>2</sup>, Fabien Granier<sup>2</sup>, Tao Liu<sup>1</sup>, Jean-Christophe Rossi<sup>1</sup> and Robert Pascal<sup>1</sup>; <sup>1</sup>IBMM, Montpellier, France; <sup>2</sup>Colcom, Montpellier, France.

11:10 AM **B1.3**  
**Dendrimers with a Fullerene Hexakis-Adduct Core.** Beatrice Delavaux-Nicot<sup>1</sup>, Julien Iehl<sup>5</sup>, Christian Amatore<sup>2</sup>, Nicola Armaroli<sup>3</sup>, Emmanuel Maisonhaute<sup>4</sup> and Jean-Francois

Nierengarten<sup>5</sup>; <sup>1</sup>Laboratoire de Chimie de Coordination du CNRS (UPR 8241), Université de Toulouse (UPS, INP), CNRS, Toulouse, France; <sup>2</sup>Ecole Normale Supérieure Université Pierre et Marie Curie-Paris 06, UMR 8640, CNRS, "PASTEUR", Paris, France; <sup>3</sup>Istituto per la Sintesi Organica e la Fotoreattività (ISOF), Consiglio Nazionale delle Ricerche (CNR), Bologna, Italy; <sup>4</sup>Laboratoire Interfaces et Systèmes Electrochimiques, UPR 15, Université Pierre et Marie Curie-Paris 06, Paris, France; <sup>5</sup>Laboratoire de Chimie des Matériaux Moléculaires (UMR 7509), Ecole Européenne de Chimie, Polymères et Matériaux (ECPM), Université de Strasbourg et CNRS, Paris, France.

11:30 AM **B1.4**  
**Inorganic-Organic Polyamidoamine (PAMAM) Hybrid Nanomaterials Derived From Incompletely-Condensed Polyhedral Silsesquioxanes.** Steven N. Kaganove<sup>1,2</sup>, Petar R. Dvornic<sup>1,2</sup>, Claire Hartmann-Thompson<sup>1,2</sup>, Tracy C. Zhang<sup>2</sup> and Douglas L. Keeley<sup>2</sup>; <sup>1</sup>Dendritech, Inc., Midland, Michigan; <sup>2</sup>Michigan Molecular Institute, Midland, Michigan.

11:50 AM **B1.5**  
**Carbosilane Dendrimers Decorated with Titanocene Dichloride.** Jan Cermak and Tomas Straszak; Institute of Chemical Process Fundamentals AS CR, v.v.i., Prague, Czech Republic.

12:10 PM **B1.6**  
**New Multivalent Dendritic and Non-dendritic Templates on Solid Support.** Moshe Portnoy, School of Chemistry, Tel Aviv University, Tel Aviv, Israel.

12:30 PM **\*B1.7**  
**PAMAM Dendrimers with Precisely Defined Numbers of Conjugated Ligands.** Mark Banaszak Holl<sup>1,2,3</sup>, James Baker<sup>2</sup>, Ankur Desai<sup>2</sup>, Douglas Mullen<sup>3,2</sup> and Mallory van Dongen<sup>1,2</sup>; <sup>1</sup>Chemistry, University of Michigan, Ann Arbor, Michigan; <sup>2</sup>MNIMBS, University of Michigan, Ann Arbor, Michigan; <sup>3</sup>Macromolecular Science and Engineering Program, University of Michigan, Ann Arbor, Michigan.

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10:20 AM - 1:00 PM  
**SESSION D: Biological Studies**  
Green Auditorium

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\* Invited paper

SESSION D1:  
Chairs: Mary Cloninger and Rene Roy  
Monday Morning, June 27, 2011  
Green Auditorium

10:20 AM **D1.1**  
**Enhanced Potencies of Multivalent Carbohydrates and Peptides in Studies Involving Toxins, Bacteria, Membranes and Microarrays.** Roland J. Pieters, Medicinal Chemistry & Chemical Biology, Utrecht University, Utrecht, Netherlands.

10:40 AM **D1.2**  
**Design of Collagen-mimic Dendrimers with Different Collagen Model Peptides.** Chic Kojima and Tomoyuki Suehiro; Osaka Prefecture University, Osaka, Japan.

11:00 AM **\*D1.3**  
**Molecular Recognition and Supramolecular Chemistry in Triazine Dendrimers: Challenges and Opportunities.** Eric Simanek, Chemistry, Texas Christian University, Fort Worth, Texas.

11:30 AM **D1.4**  
**Evaluation of a Generation 4 Phosphorus-Containing Polycationic Dendrimer for Gene Delivery Against HIV.** Veronica Briz<sup>1</sup>, M Jesus Serramia<sup>1</sup>, Cedric Olivier Turrin<sup>2</sup>, Ricardo Madrid<sup>1</sup>, Anne-Marie Caminade<sup>2</sup>, Jean Pierre Majoral<sup>2</sup> and Maria Angeles Munoz-Fernandez<sup>1</sup>; <sup>1</sup>Laboratorio Inmunobiología Molecular. Unidad Asociada de Retrovirología Humana CBM-HGUGM., Hospital General Universitario Gregorio Marañón, Madrid, Spain; <sup>2</sup>Laboratoire de Chimie de Coordination du CNRS., Toulouse, France.

11:50 AM **D1.5**

**A Highly Efficient, Non-Toxic Hybrid PPV-PAMAM Dendrimer as Non-Viral Gene Vector.**

Francisco Javier Guerra Navarro<sup>1,2,3</sup>, Ana C. Rodrigo<sup>1</sup>, Ivan Rivilla<sup>1</sup>, Francisco C. Perez-Martinez<sup>2</sup>, Silvia Monteagudo<sup>2</sup>, Vanessa Ocana<sup>4</sup>, Joaquin C. Garcia-Martinez<sup>1</sup>, Sonia Merino<sup>1</sup>, Prado Sanchez-Verdu<sup>1</sup>, Valentin Cena<sup>4,5,2</sup> and Julian Rodriguez-Lopez<sup>1</sup>; <sup>1</sup>Inorganic, Organic and Biochemistry Department, Facultad de Ciencias Químicas-IRICA-UCLM, Ciudad Real, Spain; <sup>2</sup>NanoDrugs, S.L., Albacete, Spain; <sup>3</sup>Parque Científico y Tecnológico de Albacete, Albacete, Spain; <sup>4</sup>Unidad Asociada a Neurodeath, Facultad de Medicina-CSIC-UCLM, Albacete, Spain; <sup>5</sup>CIBERNED, Instituto de Salud Carlos III, Albacete, Spain.

12:10 PM **\*D1.6**

**Biological Properties of (Phosphorus) Dendrimers: Recent Advances.** Anne-Marie Caminade<sup>1</sup>, Cédric-Olivier Turrin<sup>1</sup>,

Jean-Pierre Majoral<sup>1</sup>, Mary Poupot<sup>2</sup>, Jean-Luc Davignon<sup>2</sup>, Rémy Poupot<sup>2</sup> and Victor Furer<sup>3</sup>; <sup>1</sup>Laboratoire de Chimie de Coordination, CNRS, Toulouse, France; <sup>2</sup>INSERM U.563, Centre de Physiopathologie de Toulouse-Purpan, INSERM, Toulouse, France; <sup>3</sup>Kazan State Architect and Civil Engineering University, Kazan, Russian Federation.

12:40 PM **D1.7**

**Mannodendrimers Synthesis, Chemical Analogues of ManLAM Supramolecular Structure with Anti-inflammatory Properties.** Emilyne Blattes<sup>1</sup>, Alain Vercellone<sup>1</sup>, Cédric Olivier

Turrin<sup>2</sup>, Hélène Eutamene<sup>3</sup>, Jean-Pierre Majoral<sup>2</sup>, Anne-Marie Caminade<sup>2</sup>, Jacques Prandi<sup>1</sup> and Germain Puzo<sup>1</sup>; <sup>1</sup>Immunochimistry and mycobacterial glycoconjugates, IPBS, Toulouse, France; <sup>2</sup>Dendrimers and Heterochemistry, LCC, Toulouse, France; <sup>3</sup>Unité de Neuro-Gastroentérologie et Nutrition, INRA / INP / UPS, Tournefeuille, France.

11:00 AM **H1.3**

**Newkome-type Dendron Stabilized Gold Nanoparticles:**

**Synthesis, Reactivity, and Stability.** Tae Joon Cho<sup>1</sup>, Rebecca A. Zangmeister<sup>1</sup>, Robert I. MacCuspie<sup>1</sup>, Anil K. Patri<sup>2</sup> and Vincent A. Hackley<sup>1</sup>; <sup>1</sup>Material Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, Maryland; <sup>2</sup>Nanotechnology Characterization Laboratory, SAIC-Frederick Inc., National Cancer Institute, Frederick, Maryland.

11:20 AM **H1.4**

**Synthesis and Activity of Antifreeze Polypeptide Dendrimers.**

Ricardo Vera Bravo<sup>1</sup>, Andrew J. Scotter<sup>3</sup>, Luis H. Blanco<sup>2</sup> and Peter L. Davies<sup>3</sup>; <sup>1</sup>Chemistry, Pontificia Universidad Javeriana, Bogotá, Cundinamarca, Colombia; <sup>2</sup>Chemistry, Universidad Nacional., Bogotá, D.C., Cundinamarca., Colombia; <sup>3</sup>Biochemistry, Queens University, Kingston, Ontario, Canada.

11:40 AM **H1.5**

**Synthesis of Dendritic Nano-objects Dedicated to Horizontal Gene Transfer Between Bacteria in Soil Pollutant Bio-attenuation Processes.** Cynthia Ghobril<sup>1</sup>, Delphine

Felder-Flesch<sup>1</sup>, Genevieve Pourroy<sup>1</sup>, Sylvie Begin-Colin<sup>1</sup>, Gabriela Popa<sup>1</sup>, Simonet Pascal<sup>2</sup>, Frenea-Robin Marie<sup>3</sup> and Pivetal Jeremy<sup>2</sup>; <sup>1</sup>IPCMS, Strasbourg, France; <sup>2</sup>Environmental Microbial Genomics Group, Laboratoire Ampère, Ecole Centrale de Lyon, Ecully, France; <sup>3</sup>Bioelectromagnetism and Microsystem group, Laboratoire Ampère, Université de Lyon, Villeurbanne, France.

12:00 PM **H1.6**

**Design of a Multivalent Dendritic Polymer as an Antagonist**

**for Clinically Used Heparin Anticoagulants.** Rajesh A. Shenoi<sup>1</sup>, Benjamin F. Lai<sup>1</sup>, Dirk Lange<sup>2</sup>, Donald E. Brooks<sup>1,3</sup>, Ben Chew<sup>2</sup>, Cedric Carter<sup>1</sup> and Jayachandran N. Kizhakkedathu<sup>1,3</sup>; <sup>1</sup>Centre for Blood Research and Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, British Columbia, Canada; <sup>2</sup>Department of Urological Sciences, University of British Columbia, Vancouver, British Columbia, Canada; <sup>3</sup>Department of Chemistry, University of British Columbia, Vancouver, British Columbia, Canada.

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10:20 AM - 12:20 PM  
**SESSION H: Novel Applications**  
Lecture Room A

\* Invited paper

SESSION H1:  
Chairs: Lars Piehler and Joshua Orlicki  
Monday Morning, June 27, 2011  
Lecture Room A

10:20 AM **H1.1**

**Biofunctionalization of a Dendronized Polymer.**

Andrea Grotzky, A. D. Schluter and Peter Walde; Department of Materials, ETH Zürich, Zürich, Switzerland.

10:40 AM **H1.2**

**Synthesis of Amphiphilic Janus Dendrimers and their Self-assembly into Uniform Dendrimersomes. 10:40 AM **H1.2****

**Synthesis of Amphiphilic Janus Dendrimers and their Self-assembly into Uniform Dendrimersomes.** Virgil Percec<sup>1</sup>, Daniela A. Wilson<sup>1</sup>, Pawaret Leowanawat<sup>1</sup>, Christopher J. Wilson<sup>1</sup>, Andrew D. Hughes<sup>1</sup>, Mark S. Kaucher<sup>1</sup>, Daniel A. Hammer<sup>2,3</sup>, Dalia H. Levine<sup>3</sup>, Anthony J. Kim<sup>3</sup>, Frank S. Bates<sup>4</sup>, Kevin P. Davis<sup>4</sup>, Timothy P. Lodge<sup>4,5</sup>, Michael L. Kline<sup>6</sup>, Russell H. DeVane<sup>6</sup>, Emad Aqad<sup>1</sup>, Brad M. Rosen<sup>1</sup>, Andreea O. Argintaru<sup>1</sup>, Monika J. Sienkowska<sup>1</sup>, Kari Rissanen<sup>7</sup>, Sami Nummelin<sup>8</sup> and Jarmo Ropponen<sup>9</sup>; <sup>1</sup>Roy and Diana Laboratories, Department of Chemistry, University of Pennsylvania, Philadelphia, Pennsylvania; <sup>2</sup>Department of Bioengineering and Institute for Medicine and Engineering, University of Pennsylvania, Philadelphia, Pennsylvania; <sup>3</sup>Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, Pennsylvania; <sup>4</sup>Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, Minnesota; <sup>5</sup>Department of Chemistry, University of Minnesota, Minneapolis, Minnesota; <sup>6</sup>Institute for Computational Molecular Science, Temple University, Philadelphia, Pennsylvania; <sup>7</sup>Nanoscience Center, Department of Chemistry, University of Jyväskylä, JYU, Finland; <sup>8</sup>Molecular Materials, Department of Applied Physics, School of Science and Technology, Aalto University, Espoo, Finland; <sup>9</sup>VTT - Technical Research Centre of Finland, Espoo, Finland.

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2:00 PM - 2:50 PM  
**SESSION C: Hyperbranched Polymer Synthesis & Characterization**  
Lecture Room B

\* Invited paper

SESSION C1:  
Chair: Rana Sanyal  
Monday Afternoon, June 27, 2011  
Lecture Room B

2:00 PM **\*C1.1**

**Synthesis, Characterization and Performance of Dendritic Poly(ethylene oxide)s as <<Nanomedicines>>.** Yves Gnanou, University of Bordeaux, Pessac, France.

2:30 PM **C1.2**

**Modification of Surfaces with Self-segregating Hyperbranched Polymers.** Andre Williams, Joshua Orlicki, Adam Rawlett, Wendy Kosik, Eugene Napadensky and Julia Leadore; Army Research Lab, Aberdeen Proving Ground, Maryland.

2:50 PM **BREAK**

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2:00 PM - 3:00 PM  
**SESSION E: Drug Delivery**  
Green Auditorium

\* Invited paper

2:00 PM **E1.1**

**Intracellular Delivery of Proteins and Nucleic Acids with Dendritic Molecular Glue.** Kou Okuro<sup>1</sup>, Harei Nemoto<sup>1</sup>, Kazushi Kinbara<sup>1,2</sup>, Makoto Oba<sup>3</sup>, Kanjiro Miyata<sup>3</sup>, Nobuhiro Nishiyama<sup>3</sup>, Kazunori Kataoka<sup>1,3</sup> and Takuzo Aida<sup>1</sup>; <sup>1</sup>School of Engineering, The University of Tokyo, Tokyo, Japan; <sup>2</sup>IMRAM, Tohoku University, Sendai, Japan; <sup>3</sup>School of Medicine, The University of Tokyo, Tokyo, Japan.

2:20 PM **E1.2**

**A Fluorescent, Shape-persistent Dendritic Host with Photo-switchable Guest Encapsulation.** Tam T. Nguyen and Klaus Muellen; Max planck Institute for polymer research, Mainz, Germany.

2:40 PM **E1.3**

**Comparison of Pharmacokinetic and Anti-tumour Efficacy of a Doxorubicin-conjugated Polylysine Dendrimer with a Doxorubicin Solution and a Liposomal Doxorubicin Formulation** Lisa M. Kaminskas<sup>1</sup>, Victoria M. McLeod<sup>1</sup>, Brian D. Kelly<sup>2</sup>, Carleen Cullinan<sup>3</sup>, Gian Sberna<sup>2</sup>, Ben J. Boyd<sup>1</sup>, David J. Owen<sup>2</sup> and Christopher J. Porter<sup>1</sup>; <sup>1</sup>Drug Delivery Disposition and Dynamics, Monash Institute of Pharmaceutical Sciences, Parkville, Victoria, Australia; <sup>2</sup>Starpharm Pty Ltd, Melbourne, Victoria, Australia; <sup>3</sup>Peter MacCallum Cancer Institute, East Melbourne, Victoria, Australia.

3:00 PM BREAK

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2:00 PM - 3:00 PM  
**SESSION F: Imaging**  
Lecture Room A

\* Invited paper

SESSION F1:  
Chair: Delphine Felder-Flesch  
Monday Afternoon, June 27, 2011  
Lecture Room A

2:00 PM **\*F1.1**

**Dendrimer Based MRI Contrast Agents: Synthesis and Applications.** Martin Brechbiel, NCI, Bethesda, Maryland.

2:30 PM **\*F1.2**

**Dendritically Protected Optical Imaging Probes.** Sergei Vinogradov, University of Pennsylvania, Philadelphia, Pennsylvania.

3:00 PM BREAK

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3:20 PM - 5:00 PM  
**SESSION J: Plenary**  
Green Auditorium

\* Invited paper

SESSION J2: Plenary II  
Chair: Eric Simanek  
Monday Afternoon, June 27, 2011  
Green Auditorium

3:20 PM **\*J2.1**

**Aqua Materials: Ultrahigh-Water-Content and Ultralow-Organic-Content Hydrogels by using Dendritic Molecular Binders.** Takuzo Aida,

<sup>1</sup>Department of Chemistry and Biotechnology, The University of Tokyo, Tokyo, Japan; <sup>2</sup>RIKEN, Wako, Japan.

4:00 PM **RAPID FIRE - POSTER AUTHORS PRESENT**

A two-minute overview presentation.

**PA1.1**

**Highly Ordered Self-assembled Nanostructures Based on Poly(propylene imine) (PPI) and PPI-DNA Dendrimer Hybrids.** Jan Maly

**PA1.2**

**Pyridoxal 5'-phosphate Binding in Lysine-Modified PAMAM Dendrimers.** Ching-Hua Tsai

**PA1.3**

**Tubular Assembly of Hexameric Macrocycles with Tunable Chirality.** Zhegang Huang

**PA1.4**

**DNA Cleavage by Copper Complex of Pyridine- modified Poly (amidoamine) Dendrimers.** Yi-Hsuan Tang

Dendrimer Synthesis & Characterization

**PB1.1**

**Synthesis of Internally Branched Chiral PAMAM Dendrimers and Dendrons.** Johannes F. Petersen

**PB1.2**

**Approaches to the Preparation of Bioconjugates by Functionalization of Dendrigrft Poly-L-Lysines (DGL).** Thomas Regnier

**PB1.3**

**Ferrocenyl Cross-Linked PAMAMOS Dendrimer Networks.** Marta Herrero

**PB1.4**

**Biferrocenyl Dendritic Materials as Electrochemical Sensors.** Carmen M. Casado

**PB1.5**

**Synthesis and Acid-induced Disassembly of Sterically Congested Oligoether Dendrons.** Jeny Karabline

Biological Studies

**PD1.1**

**Bioconjugate Model Systems: Non-covalent Attachment of Glycodendrimers to Proteins - An Investigation of Size, Molar Mass and Binding Capacity.** Franka Ennen

**PD1.2**

**Cationic Carbosilane Dendrimers in Biomedical Applications.** Elena Fuentes-Paniagua

**PD1.3**

**PAMAM Dendrimers Decorating Carbon Nanohorns Surface as Efficient Gene Delivery Materials for Prostate Cancer Cells.** Francisco Javier Guerra Navarro

**PD1.4**

**The Gene-expression Profiles of HeLa Cancer Cells Treated with Activated and Non-activated Poly(amidoamine) Dendrimers, and their DNA Complexes.** Jung-hua S. Kuo

**PD1.5**

**Biocompatibility of Supramolecular Complexes of Quantum Dots-PAMAM(-FA) on Red Blood Cells.** Daniela A. Geraldo

**PD1.6**

**Glycodendrimer Mediation of Galectin-3 Induced Cancer Cell Aggregation.** Anna K. Michel

Drug Delivery

**PE1.1**

**Cancer Targeting Potential of Some Ligand-anchored Poly(propylene imine) Dendrimers: A Comparison.** Prashant Kesharwani

### PE1.2

Systemic Administration of Dendrimer-siRNA Complexes Efficiently Suppresses HIV-1 Infection. [Jichua Zhou](#)

### PE1.3

Synthesis, Characterization, and Biological Activity of Triazine Dendrimers Decorated with Brefeldin A: A Comparison of Michael-linked and Ester-linked Conjugates. [Changsuk Lee](#)

### PE1.4

Dendrimer-mediated siRNA Removal of beclin-1 Potentiates NMDA-mediated Toxicity in Rat Cortical Neurons. [Valentin Cena](#)

### PE1.5

Protein-induced Disassembly of Dendritic Supramolecular Assemblies Using Lipophilic Ligands. [Rajasekhar Reddy Rami Reddy](#)

### PE1.6

Dendritic Prodrugs of GABA, Glycine and Gabapentin. [Jesus A. Valencia-Gallegos](#)

## Computational Modeling and Databases

### PG1.1

Structurally Flexible PAMAM Dendrimers for DNA Delivery to Mouse Thymus: Combining Experimental and Modeling Evidences. [Sabrina Priel](#)

### PG1.2

Interaction Energies between PAMAM-G5 and Barbiturate Drugs. Encapsulation vs Electrostatic Interactions? [Claudia Sandoval](#)

### PG1.3

Topology of Polyaspartate Binding to Hydroxyapatite. [Kuang-Chan Hsieh](#)

### PG1.4

pH Dependence of PAMAM Conformational Changes using a Single Site and Outer Shell Titration Coordinate Models. [Daniel R. Aguayo](#)

### PG1.5

Structural Characterization of Soft Nanobiomaterials at the Single Particle Level by High Throughput / High Contrast (low voltage) Electron Microscopy. [Raul E. Cachau](#)

## Novel Applications

### PH1.1

Dendritic Antioxidants. [Ajit Sharma](#)

### PH1.2

Nanometer-sized, Rigid and Hydrophobic Anions. [David Tuerp](#)

### PH1.3

Unique Solubility Issues by Establishing a New Type of Amphiphilicity on the Periphery of Polyphenylenedendrimers. [Rene Stangenberg](#)

### PH1.4

Hyperbranched Polymers as a Flexible Platform for Paint and Coating Surface Modification. [Joshua A. Orlicki](#)

### PH1.5

Exploration of bis-MPA Based Dendrimers as Calibrant for Mass Spectrometry. [Brittany Myers](#)