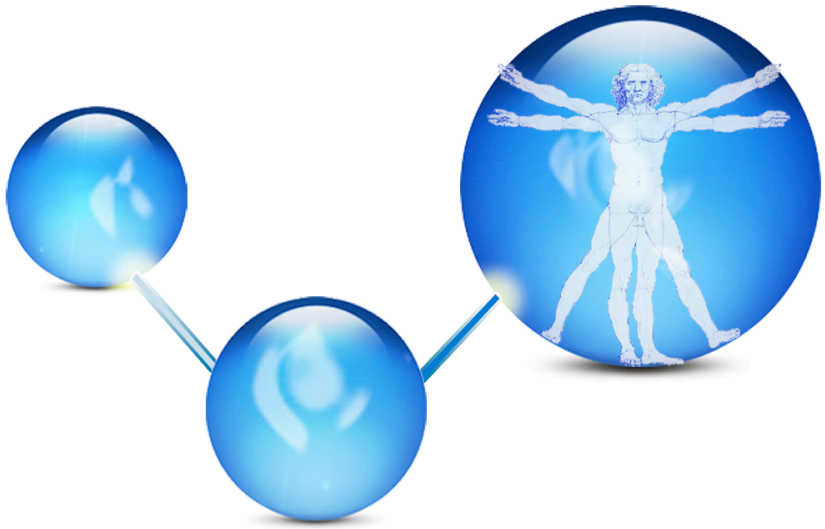
POLYMER NETWORKS 2004

17th Polymer Networks Group Meeting
August 15-19, Bethesda, MD



PROGRAM AND ABSTRACTS

Sponsored by

National Institutes of Health
National Institutes of Standards and Technology
National Institute of Child Health and Human Development
National Institute of Biomedical Imaging and Bioengineering
International Union of Pure and Applied Chemistry
NIH Biophysics Interest Group
Polymer Networks Group

CONFERENCE TOPICS

Phase Transition in Synthetic and Biopolymer Gels
Associating/Self-Assembly Systems
Polyelectrolytes and Intelligent Gels
Controlled Synthesis of Networks
Tissue Engineering and Hydrogel Scaffolds
Nano-particles in Diagnostics and Therapeutics
Gene and Drug Delivery
Simulation and Modeling of Polymer Networks

PRESENTATIONS

For oral presentations, both LCD projector and overhead projector will be available. The length of the oral presentation will be 15 minutes, plus 5 minutes for questions and answers. **Please do not extend past the scheduled presentation time.**

The posters will be up from Monday afternoon until Thursday afternoon, and will be available for viewing during all session breaks and at a designated poster session on Wednesday afternoon from 4 p.m to 6 p.m. The poster size is 4 ft x 4 ft (approx. 120 cm x120 cm).

Preparing for your computer presentation

Authors are advised to bring their own laptops, as well as other necessary accessories (e.g., power cord) required by the laptop. The LCD projector in the Natcher Conference Center is able to accommodate both MAC and PC computers.

Speakers should bring a back-up overhead presentation in case of computer incompatibilities or other unforeseeable technical difficulties.

PUBLICATION OF PAPERS

Main lectures and selected papers will be published in a special volume of *Macromolecular Symposia*.

LANGUAGE

The official language of the conference will be English.

CONFERENCE PROGRAM

MONDAY MORNING

7:30 Registration, Breakfast, Coffee

8:30 Opening Remarks

Session Chairs: Eric J. Amis and Ferenc Horkay

8:45 M01 **Plenary Lecture**
DYNAMICS OF CELLULAR ADHESION
Pierre-Gilles DeGennes *(Collège de France)*
1991 Nobel Laureate in Physics

9:45 M02 CLATHRIN BASKET FORMATION: WORLD CUP PHYSICS AT THE CELLULAR LEVEL
Ralph Nossal *(NICHD, NIH)*

10:20 M03 THERMODYNAMICS AND DYNAMICS OF EQUILIBRIUM POLYMERIZATION AND THERMALLY REVERSIBLE GELATION
Jack F. Douglas *(NIST)*

10:55 M04 LIGHT, SMALL ANGLE NEUTRON AND X-RAY SCATTERING FROM GELS
Anne-Marie Hecht, Ferenc Horkay, Peter J. Basser, Cyrille Rochas, Isbelle Morfin, Françoise Bley, Erik Geissler *(University of Grenoble, NICHD)*

11:30 M05 BLOCK COPOLYMER NETWORK PHASES
Frank S. Bates *(University of Minnesota)*

MONDAY AFTERNOON

1:30 Coffee

Session A Chair: Bruce Eichinger

2:00 M06 CHEMICALLY REVERSIBLE GELATION OF MONOMERIC AND POLYMERIC SPECIES IN ORGANIC LIQUIDS
Mathew George, Chuping Luo, Caihua Wang, Emiliano Carretti, Luigi Dei, Richard G. Weiss

2:20 M07 IMPACT OF NETWORK STRUCTURE ON DEGRADATION BEHAVIOR OF IN SITU POLYMERIZED HYDROGELS
Andrew Metters

2:40 M08 FACILE ENZYMATIC METHODS TO CREATE BIOPOLYMER-BASED GELS
Gregory F. Payne

3:00 M09 FRONTAL POLYMERIZATION: A CONVENIENT METHOD FOR THE OBTAINMENT OF POLYMER NETWORKS
Alberto Mariani, Simone Bidali, Stefano Fiori

3:20 M10 APPLICATION OF LIVING RADICAL (PHOTO)POLYMERIZATIONS TO FABRICATION AND MODIFICATION OF MICROFLUIDIC DEVICES FORMED FROM CROSSLINKED NETWORKS
J. Brian Hutchison, Craig J. Hawker, Christopher N. Bowman, Kristi S. Anseth

3:40 M11 STRUCTURE-PROPERTIES RELATIONSHIPS OF PHOTOPOLYMERIZABLE PEGDM HYDROGEL
Sheng Lin-Gibson, Sidi Bencherif, Joseph M. Antonucci, Ronald L. Jones, Newell R. Washburn, Ferenc Horkay

4:00 M12 SWELLING BEHAVIOR OF SMART THIN BLOCK COPOLYMER FILMS
Dirk Kuckling, Katja Kretschmer, Cong Duan Vo

4:20 M13 ORGANOGELATORS AND THEIR APPLICATION IN DENTAL MATERIALS
Elizabeth A. Wilder, Joseph M. Antonucci

4:40 M14 NOVEL PHYSICAL HYDROGELS FROM AMPHIPHILIC GRAFT COPOLYMERS
Carol A. Steiner

5:00 M15 THIOL-ACRYLATE PHOTOPOLYMERIZATIONS: CONTROLLED NETWORK EVOLUTION
Sirish K. Reddy, Neil B. Cramer, Kristi S. Anseth, Christopher N. Bowman

5:20 M16 SYNTHESIS AND CHARACTERIZATION OF INTERPENETRATING NETWORK PVA-CO-PAA HYDROGELS: SWELLING RESPONSES AND BIODEGRADABILITY
Samat Kumar Swain, Pradeep Kumar Rana, Prafulla Kumar Sahoo

Session B Chair: Robert F. T. Stepto

2:00 M17 NOTES ON THE SYNTHESIS, MORPHOLOGY, AND MECHANICAL BEHAVIOR OF INTERPENETRATING POLYMER NETWORKS
L. H. Sperling

2:20 M18 THE ROLE OF GELATION IN PDMS CRYSTALLIZATION
Stephan Schmidt, Yafa Yagen, Rachel Yerushalmi-Rozen, Moshe Gottlieb

2:40 M19 POLYMER NETWORKS CONFINED BY ADHESION TO FILLERS
Karel Dusek, Miroslava Duskova-Smrckova

3:00 M20 SOLUBILIZATION CAPACITY OF A COVALENTLY CROSSLINKED MICELLAR GEL
Steven R. Kline

3:20 M21 ELECTROOSMOTICALLY ENHANCED MASS TRANSPORT INSIDE CROSSLINKED POLYACRYLAMIDE GELS
Marvi A. Matos, Robert D. Tilton, Lee R White

3:40 M22 INTERACTIONS OF GLUCOSE AND POLYACRYLAMIDE IN SOLUTIONS AND GELS
Yoav D. Livney, Irina Portnaya, Benjamin Faupin, Lulu Fahoum, Ory Ramon, Yachin Cohen, Shimon Mizrahi, Uri Cogan

4:00 M23 DEVELOPMENT OF LIQUID CRYSTALLINE ORDER DURING CURE OF MESOGENIC EPOXY RESINS
Beata Mossety-Leszczak, Magdalena W.Bodarska, Henryk Galina, Tadeusz Pakula

4:20 M24 NEW APPROACHES TO THE DETECTION OF NETWORK HETEROGENEITIES BY PROTON SOLID-STATE NMR SPECTROSCOPY
Kay Saalwächter, Jens-Uwe Sommer

4:40 M25 MEASUREMENT AND EFFECT OF HETEROGENIETY OF CRO9SSLINKING IN NETWORKS
R. S. Stein

5:00 M26 WET VERSUS DRY FRICTION
F. Brochard, J. Clain

5:20 M27 POLYMER NETWORKS REINFORCED WITH POLYHEDRAL OLIGOMERIC SILSESQUIOXANES (POSS)
Libor Matejka, Josef Plestil, Irena Kroutilova, Milos Steinhart

TUESDAY MORNING

7:30 Breakfast, Coffee

Session Chairs: Jack F. Douglas, Vassilios Galiatsatos

8:00 T01 PROBING MOLECULAR PROPERTIES OF CARTILAGE: RELEVANCE TO CARTILAGE TISSUE ENGINEERING, MOLECULAR MECHANICS, AND MECHANOBIOLOGY
Alan J. Grodzinsky, L Ng, D. Dean, J. Seog, J. Kisiday, J. Fitzgerald, Christine Ortiz

8:35 T02 OSMOTIC CHARACTERIZATION OF TISSUE PROPERTIES
Peter J. Basser, Ferenc Horkay *(NICHD, NIH)*

9:10 T03 SELF ASSEMBLY OF FIBRILLAR GELS - BIOMIMETIC SYSTEMS FROM PROTEINS
Walraj S. Gosal, Allan H. Clark, Simon Ross-Murphy *(King's College)*

9:45 T04 ELASTICITY AND RHEOLOGY IN GELS: SYNTHETIC NETWORKS TO DNA
Jian Wang, Gregory B. McKenna, Won Hee Han

10:20 T05 ELECTRIC AND MAGNETIC FIELD SENSITIVE POLYMER GELS
Miklos Zrinyi *(University of Budapest)*

10:55 T06 CONFINED POLYMERS: BIG WORLD IN A SMALL SPACE
Adrian Parsegian *(NICHD, NIH)*

11:30 ***IUPAC***
R.F.T. Stepto

TUESDAY AFTERNOON

1:30 Coffee

Session A Chair: Walther Burchard

2:00 T07 THREE-DIMENSIONAL NANOPARTICLE ARRAYS TEMPLATED BY SELF-ASSEMBLED BLOCK-COPOLYMER GELS
Danilo C. Pozzo, Lynn M. Walker

2:20 T08 MULTIFUNCTIONAL NANOGELS AND LIPOBEADS
Kalle Levon

2:40 T09 INSIGHT INTO CLUSTERING IN POLYMER SOLUTIONS
Boualem Hammouda, Derek Ho

3:00 T10 STRUCTURAL AND DYNAMICAL STUDIES OF DRUG-INDUCED TUBULIN POLYMERS
H. Boukari, R. Nossal, D. L. Sackett, P. Schuck, S. Krueger

3:20 T11 STUDY OF AQUEOUS POLY(VINYL ALCOHOL) SOLUTIONS AND GELS USING FLUORESCENCE CORRELATION SPECTROSCOPY
Ariel Michelman Ribeiro, Hacène Boukari, Ralph Nossal, Ferenc Horkay

3:40 T12 THE CORRELATION BETWEEN MOLECULAR ARCITEXTURE, THE PHASE STRUCTURE AND TRANSPORT PROPERTIES IN SWOLLEN NETWORKS FORMED BY HIGHLY RIGID IONIC POLYMERS.
Dvora Perahia, Lilin He, Christopher Cornelius

4:00 T13 STRUCTURE OF BIOPOLYMER- AND POLYMER-CLAY HYDROGELS
Gudrun Schmidt, Elena Loizou, Matthew M. Malwitz, Lionel Porcar, Paul D. Butler, Ella Kesselman, Ishi Talmon

4:20 T14 COMPARISON OF THE CRITICAL EXPONENTS OBTAINED BY DYNAMIC LIGHT SCATTERING AND RHEOLOGY FROM THE POWER LAW AT THE GEL POINT ON A RADICAL CHAIN CROSS-LINKING COPOLYMERIZATION PROCESS AND MONITORING OF THE GELATION PROCESS BASED ON N-VINYLCAPROLACTAM BY USING DYNAMIC LIGHT SCATTERING
Sven Richter, Volodymyr Boyko, Klaus Schröter

4:40 T15 NOVEL NANOCOMPOSITE HYDROGELS: SYNTHESIS AND CHARACTERISTICS OF PNIPA HYDROGELS WITH A UNIQUE ORGANIC / INORGANIC NETWORK STRUCTURE
Kazutoshi Haraguchi, Toru Takehisa

5:00 T16 POLYMER GEL NANOPARTICLE DISPERSIONS WITH INVERSE THERMOREVERSIBLE GELATION
Zhibing Hu, Xiaohu Xia

5:20 T17 PH SENSITIVE NANOGELS POSSESSING PEG-COOH TETHERED CHAIN ON THE SURFACE FOR HIGH PERFORMANCE DRUG CARRIERS
Hisato Hayashi, Michihiro Iijima, Keiji Itaka, Kazunori Kataoka, Yukio Nagasaki

Session B Chair: Simon Ross-Murphy

2:00 T18 ENVIRONMENTALLY RESPONSIVE HYDROGELS WITH TUNABLE RIGIDITY CONSTRUCTED VIA PEPTIDE FOLDING AND CONSEQUENT SELF-ASSEMBLY OR BLOCK COPOLYPEPTIDE FOLDING AND SELF-ASSEMBLY
Darrin J. Pochan, Joel Schneider, Tim Deming

2:20 T19 A FLUORESCENCE METHODOLOGY FOR ASSESSING THE POLARITY OF HYDROPHYLIC POLYMERS
Boguslaw Szczupak, Alan G. Ryder, Yuri A. Rochev, Andrey S. Klymchenko, Alexander Gorelov, Thomas J. Glynn

2:40 T20 MOLECULARLY IMPRINTED POLYMER FOR 17β≤-ESTRADIOL RECOGNITION
S. Farber, B.S Greena, A.J. Domb

3:00 T21 RESPONSIVE ASSEMBLING IN POLYMER SOLUTIONS INDUCED BY OPPOSITELY CHARGED STICKERS: A CALORIMETRIC AND VISCOELASTIC STUDY.
Dominique Hourdet, Sandrine Poteau

3:20 T22 SELF-ASSEMBLED SHAPE-ENCODED HYDROGEL SENSOR ARRAYS
Scott M. Grayson, Matthew J. Schmid, Jason E. Meiring, Vijay Desai, Daniel S. U, Kalpana Manthiram, Andrew D. Ellington, C. Grant Willson

3:40 T23 KINETICS OF HELIX REVERSION AND PHYSICAL GELATION OF GELATIN
Liang Guo, Ralph H. Colby

4:00 T24 CONTROLLED MACROMOLECULE RELEASE FROM NANOSTRUCTURED HYDROGEL FILMS
L. Andrew Lyon, Christine Nolan, Michael J. Serpe

4:20 T25 NOVEL AMPHIPHILIC DENDRITIC HYDROGELS WITH ENVIRONMENTAL RESPONSE
Ivan Gitsov, Chao Zhu, Courtney Hard, Caiping Lin

4:40 T26 DENDRIMERS BASED ON MELAMINE: CANDIDATE VEHICLES FOR DRUG DELIVERY
Eric E. Simanek

5:00 T27 NANOSCTRUCTURED SMART AMPHIPHILIC POLYMER CONETWORKS AND GELS
Béla Iván, Gábor Erdodi, Márton Haraszti, Jonas Scherble, Ralf Thomann, Rolf Mülhaupt

5:20 T28 SHAPE MEMORY POLYMER ACTUATORS
Thomas S. Wilson, Jane P. Bearinger, Duncan J. Maitland

WEDNESDAY MORNING

7:30 Breakfast, Coffee

Session Chairs: Peter J. Basser and John Enns

8:00 W01 NOVEL HYDROGELS BASED ON POLY(VINYL ALCOHOL) AND AMINO ACIDS
Buddy Ratner *(University of Washington)*

8:35 W02 HYDROGELS FORMED FROM MULTIFUNCTIONAL MACROMOLECULAR MONOMERS AND THEIR APPLICATION AS CELL SCAFFOLDS
Melissa J. Mahoney, Danielle Benoit, Charles R. Nuttelman, Kristi S. Anseth *(University of Colorado)*

9:10 W03 POLYMERIC SCAFFOLDS FOR CARTILAGE TISSUE ENGINEERING
Rocky Tuan *(NIAMS, NIH)*

9:45 W04 DYNAMICS OF BIOPOLYMER NETWORKS: FROM MATERIAL STORAGE AND RELEASE IN CELL SECRETION TO MARINE POLYMER ASSEMBLY IN THE OCEAN
Pedro Verdugo *(University of Washington)*

10:20 W05 FLUORESCENCE CORRELATION SPECTROSCOPY INVESTIGATION OF GROWTH FACTOR DYNAMICS IN MODEL EXTRACELLULAR MATRICES
Newell R. Washburn, Michael D. Weir, Chia-Ying Wang, Vivek M. Prabhu, Eric K. Lin, Kenneth M. Yamada *(NIST)*

10:55 W06 POLYELECTROLYTIC AMPHIPHILIC MODEL NETWORKS: SYNTHESIS, CHARACTERIZATION AND MODELING
Costas Patrickios *(University of Cyprus)*

11:30 W07 REPETITIVE ABRUPT STRUCTURAL CHANGES IN POLYANIONIC GELS ASSOCIATED WITH SODIUM-CALCIUM ION-EXCHANGE
Ichijii Tasaki *(NICHD, NIH)*

WEDNESDAY AFTERNOON

1:30 Coffee

Session A Chair: Moshe Gottlieb

2:00 W08 EXPERIMENTAL STUDIES AND MOLECULAR MODELLING OF THE STRESS-OPTICAL AND STRESS-STRAIN BEHAVIOUR OF POLY(ETHYLENE TEREPHTHALATE)
J.I. Caill, R.F.T. Stepto, L.S. Saunders, I.M. Ward

2:20 W09 STRAIN-DEPENDENT LOCALIZATION, MICROSCOPIC DEFORMATIONS, AND MACROSCOPIC TENSIONS IN POLYMER NETWORKS
Gary S. Grest, Carsten Svaneborg, Ralf Everaers

2:40 W10 THEORY OF EMBEDDABLE RANDOM NETWORKS
Bruce E. Eichinger

3:00 W11 SIMULATION OF THE MOLECULAR STRUCTURE AND PREDICTION OF TRANSPORT PROPERTIES OF POLYMER NETWORKS SUITABLE FOR DENTAL APPLICATIONS
Vassilios Galiatsatos, B. Jeffrey Sherman

3:20 W12 UNDERSTANDING BIOPOLYMER FORMATION THROUGH LATTICE BASED MONTE CARLO SIMULATIONS
Kathleen Puskar, Leonard Apeltsin, Shlomo Ta'asan, Philip LeDuc, Russell Schwartz

3:40 W13 SIMULATIONS ON FORMATION AND STRUCTURE OF POLYMER NETWORKS
Michael Lang, Dietmar Göritz, Stefan Kreitmeier

Session B Chair: Kristi S. Anseth

2:00 W14 MECHANICAL PROPERTIES OF BIOMIMETIC TISSUE ADHESIVE BASED ON THE MICROBIAL TRANSGLUTAMINASE-CATALYZED CROSSLINKING OF GELATIN
Martin K. McDermott, Tianhong Chen, Christina M. Williams, Kolleen M. Markley, Gregory F. Payne

2:20 W15 A NEURAL STEM CELL-COLLAGEN-BIOREACTOR SYSTEM TO CONSTRUCT A FUNCTIONAL EMBRYONIC BRAIN-LIKE TISSUE
Wu Ma, Silvia Chen, Wendy Fitzgerald, Dragan Maric, Hsingch J. Lin, Thomas J. O'Shaughnessy, Jeffery L. Barker

2:40 W16 LASER MICROPATTERNING OF POLYLACTIDE MICROSPHERES INTO NEURONAL-GLIAL COCULTURE TO QUANTITATIVELY STUDY AXONAL REGENERATION
Daniel Bakken, Sriram Narasimhan, Karen Burg, Bruce Gao

3:00 W17 ENGINEERED CARTILAGE DEVELOPMENT USING PULSATILE BIOREACTORS: INFLUENCE OF FLUID STRESS ON MATRIX PRODUCTION
J.A.Cooper, S. Hudson, W.J. Li, L. Bailey, S.L.-Gibson, K.S. Anseth, R. Tuan, N.R. Washburn

3:20 W18 NOVEL POROUS THERMORESPONSIVE-CO-BIODEGRADABLE HYDROGELS AS CARTILAGE TISSUE ENGINEERING SCAFFOLDS
Xiao Huang, Yue Zhang, Henry J. Donahue, Tao L. Lowe

3:40 W19 HYBRID POLYMER SCAFFOLDS FOR TISSUE ENGINEERING
Andrew Darling, Lauren Shor, Saif Khalil, Mark Mondrinos, Wei Sun, Peter Lelkes, Selcuk Guceri

4:00-6:00 POSTER SESSION

P01 NETWORK TO PRODUCE NEW POLYMER BLENDS
Justin R. Barone, Walter F. Schmidt

P02 MOLECULAR CONFORMATIONAL CHANGES IN CARTILAGE STUDIED WITH NMR SPECTROSCOPY
Justin R. Barone, Walter F. Schmidt

P03 PROPERTIES OF LIPID MEMBRANES THAT SELF-ASSEMBLED ON PRE-LIPOBEAD SURFACES
Sean Buck, Peter Pennefather

P04 SYNTHESIS OF CROSSLINKED HYALURONIC ACID HYDROGEL FOR BONE TISSUE ENGINEERING
Guangyu Fan, Jeffrey O Hollinger

P05 SOLUTION CONFORMATIONS OF CLATHRIN TRISKELIONS
M. Ferguson, H. Boukari, D. Sackett, R. Nossal

P06 PREPARATION AND CHARACTERIZATION OF FUNCTIONALIZED ELECTROACTIVE BIOPOLYMERS
Victoria L. Finkenstadt, J. L. Willett

P07 AGGRECAN: STRUCTURE AND DYNAMICS IN SOLUTION
Ferenc Horkay, Anne-Marie Hecht, Peter J. Basser, Erik Geissler

P08 OSMOTIC SWELLING OF TISSUE ENGINEERED CARTILAGE SAMPLES
Iren Horkayne-Szakaly, Ferenc Horkay, Peter J. Basser

P09 POLYURETHANE-BASED POLYMERIC COMPOSITE HAVING A NARCOTIC DRUG ANTAGONIST EFFECT
Maya Grigorieva, Larisa Mazur, Natalia Galatenko

P10 CONSEQUENCES OF OSMOTIC STRESS ON LIPID-DNA COMPLEXES
Daniel Harries, Horia I. Petrache, Dganit Danino, Ellins Kesselman, V. Adrian Parsegian

P11 MULTI-FUNCTIONAL HYDROGELS FOR AQUEOUS LOADING AND CONTROLLED RELEASE OF NERVE GROWTH FACTOR
Xiao Huang, Tao Lu Lowe

P12 THERMO-RESPONSIVE POLY-N-SUBSTITUTED ACRYLAMIDE HYDROGELS FOR HIGH-PERFORMANCE DNA SEQUENCING BY MICROCHANNEL ELECTROPHORESIS
Cheuk-Wai Kan, Ervin A.S. Doherty, Xihua Lu, Brett A. Bucholz, Annelise E. Barron

P13 BIOPOLYMER DEPOSITION FOR FREEFORM FABRICATION OF TISSUE SCAFFOLDS
Saif Khalil, Jae Nam, Wei Sun

P14 MOLECULAR LEVEL STUDIES OF CELL-BIOMATERIALS INTERACTIONS
Catherine Klapperich

P15 CELL TRACTION INDUCES DIFFERENTIATION OF SCLERAXIS EXPRESSING MESENCHYMAL STEM CELLS
Catherine K. Kuo, Xibin Wang, Rocky S. Tuan

P16 REVERSE GELATION INDUCED BY PROTEINASES: A NOVEL UNIVERSALITY CLASS
J.-P. Carton, J. Gau, D. Lairez, J. Pelta, G. Zalczer

P17 NANOSTRUCTURE OF β-SHEET FIBRILS CONSTRUCTED BY UNFOLDED β-HAIRPIN PEPTIDE SELF-ASSEMBLY
Matthew S. Lamm, Karthikan Rajagopal, Joel P. Schneider, Darrin J. Pochan

P18 MICRORHEOLOGY OF COLLAGEN TYPE I GELS
Olga S. Latinovic, H. Daniel Ou-Yang

P19 CHARACTERIZATION OF ELECTROSPUN POLY(ALPHA-HYDROXY ESTER) BASED NANOFIBROUS SCAFFOLDS
Wan-Ju Li, James A. Cooper, Robert L. Mauck, Marcus T. Cicerone, Rocky S. Tuan

P20 THE INFLUENCE OF SIDE CHAIN STRUCTURE ON PEPTIDE INTRAMOLECULAR FOLDING AND CONSEQUENT SELF-ASSEMBLY
Zhibin Li, Lisa Haines, Bulent Ozbas, Joel Schneider, Darrin J. Pochan

P21 HYDROGELS FOR NON-ENZYMATIC GLUCOSE BIOSENSORS
In Suk Han, Man-Hee Han, Seok Lew, Jinwon Kim, Jules J. Magda

P22 THE UTILIZATION OF POLYELECTROLYTE COPOLYMER HYDROGELS FOR WEAK BIOMACROMOLECULE ALIGNMENT IN HIGH-RESOLUTION NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY
Jason S. Moulthrop, Ferenc Horkay, Ad Bax

P23 CHARACTERIZATION OF SEMIFLEXIBLE FIBRIL NETWORKS FORMED VIA INTRAMOLECULAR FOLDING AND SELF-ASSEMBLY OF AMPHIPHILIC β-HAIRPIN MOLECULES
Bulent Ozbas, Karthikan Rajagopal, Juliana Kretsinger, Joel P. Schneider, Darrin J. Pochan

P24 MORPHOLOGY OF AMPHIPHILIC DIBLOCK POLYPEPTIDES THAT CONTROLLABLY SELF-ASSEMBLE INTO HYDROGELS AND VESICLES
Lisa M. Pakstis, Andrew Nowak, Eric Holowka, Tim Deming, Darrin J. Pochan

P25 FORCES MEASURED BETWEEN NEUTRAL LIPID BILAYERS SWOLLEN BY MONOVALENT SALT
Horia I. Petrache, Itamar Kimchi, Daniel Harries, Stephanie Tristram-Nagle, Rudi Porgornik, V. Adrian Parsegian

P26 HIGH SENSITVITY, ROBUST, TAG-FREE FLUORESCENCE METHOD FOR MICROARRAY
Ravi F. Saraf, Sanjun Niu, Gaurav Singh

P27 QUANTIFICATION OF BIOPOLYMER FILAMENT STRUCTURE
Samir Shah, Bruce Rubin

P28 MULTIPLE PERMEABILITIES OF pH-SENSITIVE HYDROGELS EXPOSED TO pH GRADIENTS
Anish P. Dhanarajan, Ronald A. Siegel

P29 DUAL SUGAR-INDUCED SWELLING/SHRINKING BEHAVIORS OF PHENYLBORONIC ACID-CONTAINING HYDROGELS
Yuandong Gu, Anish P. Dhanarajan, Ronald A. Siegel

P30 NANOSIZED CYCLIC STRUCTURES OF β-1,3-D-GLUCANS: COMPETING SPECIES IN RENATURATION GELATION OF SCLEROGLUCAN
Marit Sletmoen, Bjørn E. Christensen, Erik Geissler, Bjørn Torger Stokke

P31 A MINIMAL MODEL OF TUBULIN SELF-ASSEMBLY
Justin Stambaugh, David Jones, Heather Umberger, Edward Ott, Wolfgang Losert

P32 STRUCTURE AND DYNAMICS OF PHOSPHOLIPIDS MIXTURE GELS
Howard Wang, Mu-Ping Nieh

P33 EFFECTS OF β-HAIRPIN PEPTIDE TURN SEQUENCES ON HYDROGEL NANOSTRUCTURE AND BULK MATERIAL PROPERTIES DUE TO PEPTIDE INTRAMOLECULAR FOLDING AND CONSEQUENT INTERMOLECULAR SELF-ASSEMBLY
Tuna Yucel, Karthikan Rajagopal, Darrin J. Pochan, Joel P. Schneider

P34 QUATERNARY SPERMINE CONJUGATED DEXTRAN FOR GENE TRANSFECTION
Yudovin-Farber I., Azzam T., Yanay C., Linial M., Domb A.J.

P35 MONODISPERSE CHITOSAN NANOPARTICLES FOR DRUG DELIVERY
Hong Zhang, Megan Oh, Christine Allen, Eugenia Kumacheva

P36 STRUCTURE PROPERTY RELATIONS IN GELS AND SOLUTIONS OF POLYSILOXANE IONOMERS
Ashish Batra, Claude Cohen

P37 TRIBLOCK POLY(LACTIDE)-POLY(ETHYLENE GLYCOL)-POLY(LACTIDE) HYDROGELS: STRUCTURE AND MECHANICAL PROPERTIES
Sarvesh K Agrawal, Khaled Aamer, Naomi DeLong, Gregory N. Tew, Surita R Bhatia

P38 GELATION AND MICELLAR STRUCTURE PEO-PPO-PEO COPOLYMERS IN THE PRESENCE OF PHARMACEUTICALS AND CELL MEDIA
Praveen K. Sharma, Julie E. Matthew, Surita R Bhatia

P39 ORDERING IN SEMI-FLEXIBILE CHAIN NETWORKS
Dhananjay Bhawe, Claude Cohen, Fernando Escobedo

P40 LANGMUIR-BLODGETT FILMS OF POLYETHYLENE OXIDE-POLYSTYRENE-POLYETHYLENE OXIDE TRIBLOCK COPOLYMERS – THE ROLE OF CHAIN LENGTHS IN AUTO-ASSEMBLING
Louise Deschênes, Mosto Bousmina, Anna Ritcey

P41 CROSS-LINK DENSITY OF POLYMER MATRIX IN PARTICULATE COMPOSITES
Miroslava Duskova-Smrckova, Karel Dusek, Marketa Zelenkova-Myskova, Jiri Zelenka, Jennifer L.Thompson, Clyde S. Hutchins

P42 DEPENDENCE OF CYCLIZATION ON THE ARCHITECTURE OF HYDROXY-FUNCTIONAL PRECURSORS IN POLYURETHANE NETWORK FORMATION
Miroslava Duskova-Smrckova, Karel Dusek, Andrea Durackova, Petr Vlasak, Jos Huybrechts, William J. Simonsick, Jr.

P43 SMART COMPOSITES WITH CONTROLLED ANISOTROPY
Genovéva Filipcsei, András Szilágyi, Zsolt Varga, Miklós Zrínyi

P44 PHENOL INDUCED VOLUME TRANSITION IN PNIPA HYDROGELS
Krisztina László, Katalin Kosik, Erik Geissler

P45 STRUCTURE AND SWELLING BEHAVIOR OF POROUS THERMOSENSITIVE GEL
Takehiko Gotoh, Shuji Sakohara

P46 NMR IMAGING OF WATER DIFFUSION INTO PEM/P(HEMA-*co*-THFMA) SEMI-IPN MATRICES
Mohammad Chowdhury, David Hill, Andrew Whittaker, Michael Braden, Mangala Patel

P47 KINETIC STUDY OF ORGANOGEL FORMATION BY 5α-CHOLESTAN-3β-YL N-(2-NAPHTHYL) CARBAMATE (CNC) IN TWO N-ALKANES
Xiao Huang, Pierre Terech, Charles J. Glinka, Srinivasa R. Raghavan, Richard G. Weiss

P48 POTENTIOMETRIC TITRATION AND TIME-RESOLVED pH MEASUREMENTS OF MACRO- AND MICROGELS
Sergey Kazakov, Marian Kaholek, Boris Krasnikov, Korki Miller, Kalle Levon

P49 LARGE SCALE STRUCTURES IN POLYMER-CLAY HYDROGELS STUDIED BY SCATTERING AND MICROSCOPY
Elena Loizou, Matthew M. Malwitz, Lionel Porcar, Paul D. Butler, Ella Kesselman, Ishi Talmon, Gudrun Schmidt

P50 NEW DEFORMATION MODEL FOR EXTENSION OF ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE
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THURSDAY MORNING

7:30 Breakfast, Coffee

Session Chairs: Eric J. Amis and Ferenc Horkay

8:00 R01 MANIPULATION OF POLYMER CHAIN ENTANGLEMENT AND SELF-ASSEMBLY FOR DNA SEQUENCING ANALYSIS AND GENE DELIVERY
Ben Chu *(State University of New York, Stony Brook)*

8:35 R02 PHASE TRANSITIONS IN POLYELECTROLYTE GELS
Murugappan Muthukumar *(University of Massachusetts)*

9:10 R03 NANOSCALE SURFACE ENGINEERING OF POLYMER NETWORKS: PLATFORMS TO LINK ARTIFICIAL AND BIOLOGICAL SYSTEMS
Julius Vancso *(University of Twente)*

9:45 R04 A MOLECULAR DYNAMICS SIMULATION STUDY OF NETWORK FORMATION IN SURFACTANT/BLOCK COPOLYMER SOLUTIONS
Grant D. Smith, Chakravarthy Ayyagari, Dmitry Bedrov *(University of Utah)*

10:20 R05 PULSING GELS AND GELS IN MEMS: A BASIS FOR EPISODIC DELIVERY OF INSULIN AND REPRODUCTIVE HORMONES
Ronald A. Siegel, Yuandong Gu, Anish P. Dhanarajan, Antonio Baldi, Babak Ziaie *(University of Minnesota)*

10:55 R06 PULLING A POLYMER THROUGH A MEMBRANE: COUPLING OF THE POLYMER THREADING A MEMBRANE TRANSITION TO THE ADSORPTION ONTO A MEMBRANE TRANSITION
Edmund A. DiMarzio, Charles M. Guttman *(NIST, University of Maryland)*

11:30-12:00 ANNOUNCEMENTS (Committee meeting, Next Conference, etc.)

THURSDAY AFTERNOON

1:30 Coffee

Session A Chair: Karel Dusek

2:00 R07 NANOSCIENCE IN OPHTHALMOLOGY: USE OF NANOGELS INUNDERSTANDING THE MOLECULAR ORIGINS OF LENS VISCOELASTICITY AND REFRACTIVE INDEX
Nathan Ravi

2:20 R08 IONIC DIFFUSION IN POLYMERS
S. Boeykens, M. Daraio, N. Temprano, M. Rosen

2:40 R09 ACTIN POLYMERIZATION IN A THERMAL GRADIENT: NON-EQUILIBRIUM NETWORK STRUCTURE AND POLYMERIZATION FORCES
Andrew Pomerance, Jermey Matthews, Matt Ferguson, Jeffrey Urbach, Wolfgang Losert

3:00 R10 STABILIZATION OF LIPOSOMAL MEMBRANES BY POLYMER NETWORKS ANCHORED TO THE INNER MEMBRANE SURFACE
Oliver Stauch, Rolf Schubert, Gabriela Savin, Walther Burchard

3:20 R11 INTERNAL TENSION: A NOVEL HYPOTHESIS CONCERNING THE STIFFNESS OF THE VITREOUS BODY
Charles S. Nickerson, Hampar L. Karageozian, John Park, Julia A. Kornfield

3:40 R12 VESICLE GELS: NETWORKS OF VESICLES CONNECTED BY HYDROPHOBICALLY-MODIFIED BIOPOLYMERS
Jae-Ho Lee, John P. Gustin, Tianhong Chen, Gregory F. Payne, Srinivasa R. Raghavan

4:00 R13 ION-DEPENDENT HYDRATION AND TRANSPARENCY OF THE STROMA, A POLYELECTROLYTE BIOGEL
Joseph W. Huff

4:20 R14 SURFACE MORPHOLOGIES OF LAYERED NANOSTRUCTURES OF SEMIFLEXIBLE BIOPOLYMER
Gjertud Maurstad, Endre Marken, Bjørn Torger Stokke

Session B Chair: Erik Geissler

2:00 R15 STRUCTURAL AND MECHANICAL CHARACTERISTICS OF SILK FIBROIN CHITOSAN BLEND SCAFFOLDS
Andrea S. Gobin, Anshu B. Mathur

2:20 R16 VISCOELASTICITY OF CYTOSKELETAL PROTEIN NETWORK IN LIVING CELLS
Elizabeth A. Rickter, Linda Lowe-Krentz, H. Daniel Ou-Yang

2:40 R17 STABLE IMMOBILIZATION OF RAT HEPATOCYTE SPHEROIDS ON GALACTOSYLATED NANOFIBER SCAFFOLD
Kian Ngiap Chua, Seeram Ramakrishna, Kam W. Leong, Hai-Quan Mao

3:00 R18 THE EFFECTS OF APPLIED PRESSURE, PROTEOGLYCAN DEPLETION AND DETACHMENT FROM THE BONE ON THE COLLAGEN FIBERS NETWORK IN ARTICULAR CARTILAGE
Gil Navon, Hadassah Shinar, Keren Keinan-Adamsky

3:20 R19 CYTOSKELETON FILAMENT DYNAMICS AND THE CONTROL OF CELL MOTILITY, MECHANICS AND POLARIZATION
Thomas P. Kole, Yiider Tseng, Denis Wirtz

3:40 R20 SYNTHESIS AND EVALUATION OF POLYDEPSIPEPTIDE HAVING THERMO-SENSITIVITY AND BIODEGRADABILITY
Tatsuro Ouchi, Mitsuhiro Sasakawa, Yoshiyuki Yasui, Megumi Toyohara, Yuichi Ohya

4:00 **R21** IMAGING THERAPEUTIC PROTEINS USING X-RAY TOMOGRAPHY
A. Wagoner Johnson, N. Juan Serrano, A. W. Morgan, R. Jamison, Y.B.Choy, H. Choi, K. Kim, F. Decarlo

4:20 **R22** SELF-ASSEMBLY OF SMALL MOLECULES TO CONFER HYDROGEL AS BIOMATERIALS
Bing Xu, Yan Zhang, Zhimou Yang, Bengang Xing, Hongwei Gu, Keming Xu, Ling Wang

5:30 Buses leave from Bethesda to the conference dinner.

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