

## ELENA E. DORMIDONTOVA - CURRICULUM VITAE

### PRESENT AFFILIATION:

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<http://cube.case.edu/>



### EDUCATION AND SCIENTIFIC DEGREES:

- 05.1994 Ph D in Physics and Mathematics, Physics Department, Moscow State University (Supervisor Prof. A.R. Khokhlov). The title of the thesis (theoretical study) is “Conformational Behavior of Complex Polymer System”
- 01.1991 B.A., M.S. in Physics, Physics Department Moscow State University

### EMPLOYMENT HISTORY:

- 07.2008-present Associate Professor  
Department of Macromolecular Science & Engineering, Case Western Reserve University
- 07.2002-6.2008 Assistant Professor  
Department of Macromolecular Science & Engineering, Case Western Reserve University
- 04.2002-06.2002 Visiting Assistant Professor  
Department of Macromolecular Science & Engineering, Case Western Reserve University
- 10.1999-04.2002 Postdoctoral Associate  
Department of Chemical Engineering and Materials Science, University of Minnesota, USA (Polymer group, collaborated with group of Prof. T. Lodge, Department of Chemistry)
- 09.1996-10.1999 Postdoctoral Researcher  
Department of Polymer Chemistry, University of Groningen,  
(Prof. Ten Brinke, also collaboration with the experimental group of Prof. G. Hadzioannou)
- 05.1994-09.1996 Researcher  
Physics Department Moscow State University, Chair of Polymer and Crystal Physics (head: Prof. A.R. Khokhlov)

### AWARDS AND RECOGNITION

- 01.2007 – present Climo Professorship for the Case School of Engineering
- 04.2004 – present National Science Foundation (NSF) CAREER Award (CHE-0348302):  
“CAREER: Theoretical Modeling of Head-to-Tail Reversibly Associated Polymers in Solution and at Surfaces”

## RESEARCH INTERESTS

Statistical physics of macromolecules, computer modeling and statistical analysis of associating, supramolecular, biocompatible, hydrogen bonded, and water-soluble polymers (their properties and applications for biomimetics and drug delivery); nanoparticle targeting for drug delivery and drug release; ligand-cell receptor interactions; nanoparticle-surface interactions under flow fields; phase behavior of complex polymer and biopolymer systems; polymer micelles (at thermodynamic equilibrium and micellization kinetics including the incorporation of hydrophobic materials); supramolecular polymers and biopolymers at surfaces and interfaces.

## PROFESSIONAL ACTIVITIES:

American Chemical Society  
American Physical Society  
NIH panel review (Gene and Drug Delivery Panel, Santa Monica, CA Feb. 6-8, 2008)  
NSF CAREER panel review  
NSF proposal review  
Reviewer for *Macromolecules*, *Journal of Chemical Physics*, *Journal of Polymer Science: Polymer Physics*, *Journal of Physical Chemistry B*, *Polymer*, Wiley books.

## PEER-REVIEWED PUBLICATIONS

These publications have resulted in 441 citations and a Hirsch Index of 13

1. E.E. Dormidontova, A.Yu. Grosberg, A.R. Khokhlov  
Intramolecular Phase Separation of a Polymer Chain with Mobile Ligands  
*Vysokomolek. Soedin. (Polymer Science - USSR)* v34, 126, 1992.
2. E.E. Dormidontova, A.Yu. Grosberg, A.R. Khokhlov  
Intramolecular Phase Separation of a Polymer Chain with Mobile Primary Structure  
*Makromol.Chem. Theory. Simul.* v.1, 375, 1992
3. E.E. Dormidontova, I.Ya. Erukhimovich, A.R. Khokhlov  
Microphase Separation in Poor Solvent Polyelectrolyte Solutions: Phase Diagram  
*Macromol.Theory Simul.* v.3, 661-675, 1994
4. E.E. Dormidontova, I.Ya. Erukhimovich, A.R. Khokhlov  
Phase Diagram for Microphase Separation Transition in Poor Solvent Polymer Solutions  
*Colloid Polym.Sci.* v.272, 1486-1497, 1994
5. E.E. Dormidontova, I.Ya. Erukhimovich, A.R. Khokhlov  
Nano-Structures in Poor Solvent Polymer Solutions Near Glass Transition Temperature  
*Macromol. Symp.* v.106, 103-117, 1996
6. E.E. Dormidontova, A.R. Khokhlov  
Complex Spherical Micelles in A-B-C Block Copolymer Melts  
*Macromolecules* v.30, 1980-1991, 1997
7. K.B. Zeldovich, E.E Dormidontova, A.R. Khokhlov, T.A. Vilgis  
Microphase Separation Transition for Polyelectrolyte Gels in Poor Solvents  
*J. Phys. II* v.7, 627-635, 1997

8. A.R. Khokhlov, E.E. Dormidontova  
Self-Assembly in Ion-containing Polymer Systems  
*Physics-USpekhi (Uspekhi Phisicheskix Nauk)* (review) v.40,109-124, 1997
9. E.E. Dormidontova, G. ten Brinke  
Phase Behaviour of Hydrogen Bonding Polymer-Oligomer Mixtures  
*Macromolecules* v.31, 2649-2660, 1998
10. F.J. Esselink, E.E. Dormidontova, G. Hadziioannou  
Evolution of Block Copolymer Micellar Size and Structure Evidenced with Cryo Electron Microscopy  
*Macromolecules* v.31, 2925-2932, 1998
11. F.J. Esselink, E.E. Dormidontova, G. Hadziioannou  
Redistribution of Block Copolymer Chains between Mixed Micelles in Solution  
*Macromolecules* v.31, 4873-4878, 1998
12. E.E. Dormidontova, G. ten Brinke  
Microphase Separation in Hydrogen Bonding Polymer/Surfactant Melts  
*Colloids and Surfaces A*. v.147, 249-262, 1999
13. E.E. Dormidontova  
Micellization Kinetics in Block Copolymer Solutions: Scaling Model  
*Macromolecules*, v.32, 7630-7644, 1999
14. E.E. Dormidontova, G. ten Brinke  
The Influence of Elongational Flow on Association Rate and Phase Behaviour of Binary Polymer Blends  
*Macromolecular Symposia*, v.149, 23-30, 2000
15. V. Grayer, E.E. Dormidontova, G. Hadziioannou, C. Tsitsilianis  
A Comparative Experimental and Theoretical Study between Heteroarm Star and Diblock Copolymers in the Microphase Separated State  
*Macromolecules* v. 33, 6330-6339, 2000
16. E.E. Dormidontova, G. ten Brinke  
The Influence of Elongational Flow on Hydrogen Bond Formation and Stability of the Homogeneous Phase of Binary Hydrogen-Bonded Polymer Blends  
*Macromolecular Symposia* v.158, 125-136, 2000
17. E.E. Dormidontova, G. ten Brinke  
Association Behavior of Binary Polymer Mixtures under Elongational Flow  
*J Chem. Phys.* v.113 (11), 4814-4826, 2000
18. E.E. Dormidontova, T.P. Lodge  
The Order-Disorder Transition and the Disordered Micelle Phase in Sphere-Forming Block Copolymer Melts  
*Macromolecules* v.34 (26), 9143-9155, 2001
19. E.E. Dormidontova  
The Role of Competitive PEO-Water and Water-Water Hydrogen Bonding in Aqueous Solutions of PEO  
*Macromolecules* v.35 (3), 987-1001, 2002

20. X. Wang, E.E. Dormidontova, T.P. Lodge  
The Order-Disorder Transition and the Disordered Micelle Regime for Poly(ethylenepropylene-  
b-dimethylsiloxane) Spheres  
*Macromolecules* v.35, 9687-9697, 2002
21. M.M. Feldstein, A. Roos, C. Chevallier, C. Creton, E. E. Dormidontova  
Relation of Glass Transition Temperature to the Hydrogen Bonding Degree and Energy in  
Poly(N-Vinyl Pyrrolidone) Blends with Hydroxyl - Containing Plasticizers: 3. Analysis of Two  
Glass Transition Temperatures Featured for PVP Solutions in Liquid Poly(ethylene glycol)  
*Polymer*, 44(6), 1819-1834, 2003
22. C.-C. Chen, E.E. Dormidontova  
Ring-Chain Equilibrium in Reversibly Associated Polymer Solutions: Monte Carlo Simulations  
*Macromolecules*, 37 (10), 3905-3917, 2004
23. E.E. Dormidontova  
The Influence of Terminal Groups on Phase Behavior and Properties of PEO in Aqueous Solu-  
tions  
*Macromolecules*, 37, 7747-7761, 2004
24. C.-C .Chen, E.E. Dormidontova  
Supramolecular Polymer Formation by Metal-Ligand Complexation: Monte Carlo Simulations  
and Analytical Modeling  
*JACS*, 126, 14972-14978, 2004
25. C.-C. Chen, E.E. Dormidontova  
Architectural and Structural Optimization of Protective Polymer Layer for Enhanced Targeting  
*Langmuir*, 21, 5605-5615, 2005
26. Reidar Lund; Lutz Willner, Dieter Richter, E.E. Dormidontova  
Equilibrium Chain Exchange Kinetics of Diblock Copolymer Micelles: Tuning and Logarith-  
mic Relaxation  
*Macromolecules*, 39, 4566-4575, 2006
27. C.-C. Chen, E.E. Dormidontova  
Monte Carlo Simulations of End-Adsorption of Head-to-Tail Reversibly Associated Polymers  
*Macromolecules* 39, 9528-9538, 2006
28. M. Hagy, C.-C .Chen, E.E. Dormidontova  
The Effect of Orientational Specificity of Complexation on the Behavior of Supramolecular  
Polymers: Theory and Simulation  
*Macromolecules* 40, 3408 – 3421, 2007
29. D. Sutton, S. Wang, N. Nasongkla, J.Gao, E.E. Dormidontova  
Doxorubicin and  $\beta$ -lapachone Release and Interaction with Micelles Core Materials: Experi-  
ment and Modeling  
*Experimental Biology and Medicine* 232, 1090-1099, 2007

30. S. Wang, C-C. Chen, E.E. Dormidontova  
Reversible Association and Gelation in 3:1 Ligand-Metal Polymer Solutions, *Soft Matter (in press)* DOI: 10.1039/b802839g

31. M. Hagy, S. Wang, E. E. Dormidontova  
Tuning Architectures of Ligand-Terminated Polymer Layers to Achieve Specific Targeting, *Langmuir (accepted for publication)*

32. S. Wang; E. E. Dormidontova, "Switchable Reversible Metallo-Supramolecular Gels through cis- and trans- Isomerization" in preparation.

#### PUBLICATIONS (non-peer-reviewed):

1. C.-C. Chen, E.E. Dormidontova; Computer modeling of reversible association in metallo-supramolecular polymers, *Polymer Preprints* 45(1), 391, 2004
2. C.-C. Chen, E.E. Dormidontova; Monte Carlo Simulations of Polymer Brushes Formed by Reversible Head-to-Tail Associating Polymers, *Polymeric Materials: Science and Engineering* 90, 370, 2004
3. S. Wang, C.-C. Chen, E.E. Dormidontova; Monte Carlo Simulation of Self-Assembling Supramolecular Gel *Polymer Preprints* 2007, 48(1), 231
4. M.C. Hagy, C.-C. Chen, E.E. Dormidontova; Simulation of Reversibly Associated Polymers with Orientational Specificity; *Polymer Preprints* 2007, 48(1), 991
5. S. Wang, C.-C. Chen, E. E. Dormidontova; Theoretical Modeling of Equilibrium Metallo-Supramolecular Gels, *Polymer Preprints* 2007, 48(2), 641

#### POPULAR SCIENCE:

R. Lund, L. Willner, P. Lindner and D. Richter, C.C. Chen, E.E. Dormidontova; Polymer Chains Queuing inside Micellar Cores *ILL Annual Report 2005*, p.48-49.

#### INVITED LECTURES

1. Theoretical Modeling of Equilibrium Metallo-Supramolecular Gels, at the Symposium on Metal-Containing and Metallo-Supramolecular Polymers and Materials, ACS meeting, August 2007, Boston, USA
2. Mathematical Modeling of Reversibly Associated Polymers, presented at University of Akron (Department of Polymer Engineering), April 2007
3. End-adsorption of head-to-tail associating polymers on surfaces, presented at University of Twente, February 2007 Reversibly Associating Polymers: Versatility of Properties and Complexity of Behavior, Presented at TU Delft, February 2007

4. Theoretical Aspects of Nanoparticle Targeting in Drug Delivery, presented at the Nanomedicine Symposium 2006, Dallas, Texas, Dec.11, 2006
5. Theoretical Modeling of Hydrogen Bonded and Metal-Ligand Associating Polymers presented at the APS meeting, Baltimore, USA, March 13-17, 2006
6. Theoretical and Computer Modeling of Reversibly Associated Polymers, presented at Georgia Institute of Technology (School of Polymer, Textile and Fiber Engineering) October 2005.
7. Theoretical Modeling of Phase Separated and Reversibly Associating Polymer Systems, presented at Specialty Minerals Inc., Bethlehem, PA, July 2005
8. Theoretical and Computer Modeling of Complex Polymer Systems: Associating Polymers and Ligand-Receptor Interactions, presented at John Carroll University (Chemistry Department), December 2004.
9. Computer Modeling of Targeting Enhancement for Gene/Drug Delivery, presented at the Rolduc Polymer Meeting, Kerkrade, The Netherlands, June 27-30, 2004.
10. Theoretical insights on reversible associations of polyethylene oxide in aqueous solutions and blends, presented at Max-Planck-Institute for Polymer Research, Mainz, Germany, June 4, 2004
11. Micellization Kinetics in Diblock Copolymer Solutions, presented at the University of Juelich, Germany, July 4, 2004
12. Hydrogen Bonding in Aqueous Solutions of PEO: Theoretical Insights, presented at the APS meeting, Montreal, Canada, March 22-26, 2004
13. Reversibly Associated Polymers: Theoretical Insights, presented at the University of Akron (Physics Department) September 25, 2003.
14. Theoretical and computer modeling of reversibly associated polymers: new insight, presented at Eindhoven University of Technology, The Netherlands, June 2, 2003.
15. Theoretical insights on the behavior of reversibly associated polymers, presented at Department of Chemical Engineering, K. U. Leuven University, Leuven, Belgium, May 21, 2003
16. Theoretical insights on reversibly associating polymers: the example of poly (ethylene oxide/glycol) in aqueous solutions and blends with PVP, presented at ESPCI, Paris, France, May 22, 2003

#### ORAL PRESENTATIONS AND POSTERS

40 Contributed oral presentations and 26 posters (including those presented by members of the E. Dormidontova group) (complete list available upon request)