

## CURRICULUM VITAE

**İrem EREL-GÖKTEPE**

(Associate Professor of Chemistry)

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### **EDUCATION**

- Ph.D.** Stevens Institute of Technology, Hoboken, NJ, USA  
Polymer Chemistry  
Thesis Title: pH-Responsive Functional Polymer Multilayers Based on Hydrogen Bonding
- M.S.** Istanbul Technical University, Maslak, Istanbul, Türkiye  
Polymer Science and Technology  
Thesis Title: Synthesis of block copolymers by combination of photoinduced and atom transfer radical polymerization routes
- B.S.** Istanbul Technical University, Maslak, İstanbul, Türkiye  
Chemistry

### **GRANTS, AWARDS and HONORS**

- TÜBİTAK-3501 Career Development Program (Ongoing) (2014-2017)  
Project Title: Preparation and Characterization of Magnetothermally Responsive Ultra-thin Polymer Multilayer Films for Controlled Release Applications  
Budget: 290,737 TL; Duration: 3 years
- European Union 7<sup>th</sup> Framework Programme Marie Curie Reintegration Grant (Completed) (2011-2015)  
Project Title: Functional Multilayer Films  
Budget: 100.000 EURO; Duration: 4 years
- L'Oréal-National Fellowship For Young Woman in Science Award (Supported by TÜBA) (Completed) (2010-2011)  
Project Title: Block Copolymer Micelle Containing Ultra-thin Multilayer Films for Controlled Release Applications  
Budget: 12.000 USD; Duration: 1 year
- METU-BAP (Completed)  
Project Title: Preparation of Functional Surfaces by Layer-by-Layer Self-Assembly Technique  
Budget: 30.000 TL; Duration: 2 years and 7 months
- Outstanding Graduate Achievement Award  
Stevens Institute of Technology, New Jersey, USA - 2009
- Research Assistantship, Stevens Institute of Technology, (Spring 2006-Spring 2009)
- Teaching Assistantship, Stevens Institute of Technology, (Spring 2005-Spring 2006)
- TÜBİTAK; Münir Birsal Vakfı Graduate Research Scholarship (Sept 1999- Feb 2001)

### **RESEARCH INTERESTS**

Preparation and characterization of stimuli responsive ultra-thin polymer multilayer films-which change properties upon changes in pH, temperature or magnetic field- using layer-by-layer self-assembly technique. Specifically, the following topics are of interest.

- Preparation and characterization of interpolymer complexes in solution and at surfaces.

- Developing strategies to improve the pH-stability and controlling the disintegration kinetics of hydrogen-bonded multilayers.
- Self-assembly of block copolymers in solution; preparation of multilayers containing block copolymer micelles; pH and/or temperature triggered release of functional molecules from the micellar cores as well as the film surface.
- Developing strategies to incorporate zwitterionic block copolymer micelles into multilayer films and investigating the potential use of such polyzwitterion based multilayers in biomedical applications.
- Preparation and characterization of magnetothermally responsive polymer multilayer films.

## **TEACHING EXPERIENCE**

- Physical Chemistry II (CHEM 353) – METU; 2016 Fall
- Polymer Chemistry (PST 501, Graduate Course) – METU; 2012-,2013-, 2014-, 2015- Fall Semesters
- Advanced Structure-Property Relationship in Polymers (PST 504, Graduate Course) – METU; 2012-, 2013-, 2014- Spring Semesters (co-taught with Prof. Dr. Leyla Aras in Spring-2012)
- General Chemistry I (CHEM 111, Undergraduate Course) – METU; 2011-, 2012-, 2013-, 2014-, 2015- Fall Semesters
- General Chemistry II (CHEM 112, Undergraduate Course) – METU; 2011-, 2012-, 2013-, 2014- Spring Semesters
- Techniques of Surface and Nanostructure Characterization – Stevens Institute of Technology (co-taught with Prof. S. Sukhishvili and Prof. H. Du in Spring-2009)
- General Chemistry Laboratory Course - Stevens Institute of Technology; 2005 Spring and Fall Semesters
- supervised 5 undergraduate students under Summer Research Program at Stevens Institute of Technology
- General Chemistry Laboratory Course - Istanbul Technical University; 1999-Fall and 2000-Spring Semesters (as student teaching assistant)

## **INTERNATIONAL PEER-REVIEWED RESEARCH PUBLICATIONS**

as of March 31<sup>st</sup>, 2017

**TOTAL CITATIONS = 371 ; CITED BY OTHERS = 357; h-index = 9**

(Thomson Reuters Web of Science)

### **IN PREPARATION**

- Ustoglu, C.; Cagli, E.; **Erel-Goktepe, I.** “Erasable Multilayer Films via Temperature Trigger”.
- Cagli, E.; **Erel-Goktepe, I.** “Effect of pH, Ionic Strength and Temperature on the Self-assembly of Poly(2-isopropyl-2-oxazoline).

### **SUBMITTED**

- Haktanyan, M.; Atilla, S.; Cagli, E.; **Erel-Goktepe, I.** "pH- and Temperature-Induced Release of Doxorubicin from Multilayers of Polyoxazolines".

### **PUBLISHED**

**A1.** Onat, B.; Butun, V.; Banerjee, S.; **Erel-Goktepe, I.** “Bacterial Anti-adhesive and pH-induced Anti-bacterial Agent Releasing Ultra-thin Films Containing Zwitterionic Block Copolymer Micelles”. *Acta Biomaterialia*, 2016, 40, 293-309.

**A2.** Bag, E.; Begik, O.; Yusan, P.; **Erel-Goktepe, I.** “Hydrogen-bonded Multilayers with Controllable pH-induced Disintegration Kinetics for Controlled Release Applications from Surfaces” *Journal of Macromolecular Science, Part A: Pure and Applied Chemistry*, 2015, 52, 286.

**A3.** Yusan P.; Tuncel, I.; Bütün, V.; Demirel, A.L; **Erel-Goktepe, I.** “pH-Responsive Layer-by-layer Films of Zwitterionic Block Copolymer Micelles”, *Polymer Chemistry*, 2014, 5, 3777.

- A4.** Hippus, C.; V.Butun; **Erel-Goktepe, I.** “Bacterial Anti-adhesive Properties of a Monolayer of Zwitterionic Block Copolymer Micelles” *Materials Science and Engineering: C Materials for Biological Applications*, 2014, 41, 354.
- A5.** Taskin, O.S.; **Erel-Goktepe, I.**; Khan, M.A.A; Pispas, S.; Yagci, Y. “Polystyrene-*b*-poly(2-vinyl phenacyl pyridinium) Salts as Photoinitiators for Free Radical and Cationic Polymerizations and Their Photoinduced Molecular Associations” *Journal of Photochemistry and Photobiology A: Chemistry*, 2014, 285, 30.
- A6.** **Erel, I.**; Karahan, E.H., Tuncer, C.; Bütün, V.; Demirel, A.L “Hydrogen-Bonded Multilayers of Micelles of a Dually Responsive Dicationic Block Copolymer” *Soft Matter*, 2012, 8, 827.
- A7.** **Erel, I.**; Schlaad, H.; Demirel, A.L. “Effect of Structural Isomerism and Polymer End Group on the pH-Stability of Hydrogen Bonded Multilayers” *J. Colloid Interface Sci.*, 2011,361, 477.
- A8.** **Erel, I.**; Zhu, Z.; Zhuk, A.; Sukhishvili, S. A. “Hydrogen-Bonded Layer-by-Layer Films of Block Copolymer Micelles with pH-Responsive Cores” *J. Colloid Interface Sci.*, 2011, 355, 61.
- A9.** **Erel, I.**; Zhu, Z.; Sukhishvili, S. A.; Patyukova, E.; Potemkin, I.; Kramarenko, E.“Two Types of Block Copolymer Micelles with Ion-containing Cores” *Macromolecular Rapid Communications*, 2010, 31, 490.
- A10.** Kozlovskaya, V.; Kharlampieva, E.; **Erel, I.**; Sukhishvili, S. A. “Multilayer-derived ultrathin, stimuli-responsive hydrogels” *Soft Matter*, 2009, 5, 4077.
- A11.** **Erel-Unal, I.**; Sukhishvili, S. A. “Hydrogen-bonded multilayers of a neutral polymer and a polyphenol” *Macromolecules*, 2008, 41(11), 3962.
- A12.** **Erel-Unal, I.**; Sukhishvili, S. A. “Hydrogen-bonded hybrid multilayers: Film architecture controls release of macromolecules” *Macromolecules*, 2008, 41(22), 8737.
- A13.** Kharlampieva, E.; **Erel-Unal, I.**; Sukhishvili, S. A. “Amphoteric Surface Hydrogels Derived from Hydrogen-Bonded Multilayers: Reversible Loading of Dyes and Proteins” *Langmuir*, 2007, 23(1), 175.
- A14.** **Erel, I.**; Cianga, I.; Serhatli, E.; Yagci, Y. “Synthesis of block copolymers by combination of photoinduced and atom transfer radical polymerization routes” *European Polymer Journal*, 2002, 38(7), 1409.
- A15.** Kozlovskaya, V.; Kharlampieva, E.; **Erel-Unal, I.**; Sukhishvili, S. A. “Single-component layer-by-layer weak polyelectrolyte films and capsules: Loading and release of functional molecules” *Polymer Science Series A*, 2009, 51(6), 719.

### **INTERNATIONAL CONFERENCE PROCEEDINGS**

- B1.** Sukhishvili, S.A.; Zhu, Z.; **Erel-Unal, I.** “Monolayers and Multilayers of Dually Responsive micelles”, PMSE (Polymer Materials: Science and Engineering) Proceedings published 2009 by the American Chemical Society. *ACS National Meeting, Fall 2009, Washington, DC, USA.*
- B2.** **Erel-Unal, I.**; Zhu, Z.; Sukhishvili, S.A. “Hydrogen-Bonded Multilayers of a pH and Temperature Responsive Block Copolymer Micelle”, PMSE (Polymer Materials: Science and Engineering) Proceedings published 2008 by the American Chemical Society. *ACS National Meeting, Fall 2008, Philadelphia, PA, USA.*
- B3.** **Erel-Unal, I.**; Sukhishvili, S.A. “Biocompatible Hydrogen-Bonded Polymer Multilayers: Tuning Film Destruction”, PMSE (Polymer Materials: Science and Engineering) Proceedings published 2007 by the American Chemical Society. *ACS National Meeting, Fall 2007, Boston, MA, USA.*
- B4.** **Erel-Unal, I.**; Kharlampieva, E.; Sukhishvili, S.A. “pH-Controlled Inclusion of Dyes within Surface Hydrogels”, PMSE (Polymer Materials: Science and Engineering) Proceedings published 2006 by the American Chemical Society. *ACS National Meeting, Fall 2006 San Francisco, CA, USA.*

### **INTERNATIONAL CONFERENCE ABSTRACTS**

- C1.** Cagli, E.; **Erel-Goktepe, I.** “Magnetothermally responsive polymer nanofilms of polyoxazoline block copolymer micelles” 6th EuCheMS Chemistry Congress, 2016, September, Seville, Spain.
- C2.** Haktanyan, M.; Atilla, S.; **Erel-Goktepe, I.**; Cagli, E. “pH and Temperature-Triggered Release of Doxorubicin from Hydrogen-bonded Multilayer Thin Films of Poly(2-isoprpyol-2-oxazoline)” 6th EuCheMS Chemistry Congress, 2016, September, Seville, Spain.

- C3.** Gundogdu, D.; **Erel-Goktepe, I.**; Bütün, V.; “Effect of Branching of the Coronal Chains of a Polymeric Micelle on pH-Triggered Release of an Anticancer Drug from Multilayer Thin Films” 6th EuCheMS Chemistry Congress, 2016, September, Seville, Spain.
- C4.** Cagli, E.; **Erel-Goktepe, I.** “Controlled Release of Paclitaxel from Multilayers of block copolymer micelles with Temperature-Responsive coronae and pH-responsive cores” Macro 2016, 46th IUPAC World Polymer Congress, 2016, Istanbul, Turkey.
- C5.** Ustoglu, C.; Cagli, E.; **Erel-Goktepe, I.** “Introducing Upper Critical Solution Temperature to Polymer Multilayer Films” Macro 2016, 46th IUPAC World Polymer Congress, 2016, Istanbul, Turkey.
- C6.** Haktanyan, M.; Atilla, S.; Cagli, E.; **Erel-Goktepe, I.** “Release of Doxorubicin from Layer-by-Layer Films of Poly (2-isopropyl-2-Oxazoline)” Macro 2016, 46th IUPAC World Polymer Congress, 2016, Istanbul, Turkey.
- C7.** Onat, B.; Butun, V.; Banerjee, S.; **Erel-Goktepe, I.** "Multifunctional Anti-Adhesive Films Prepared by Layer-by-Layer Formation of Zwitterionic Micelles" 27<sup>th</sup> European Conference on Biomaterials, 2015, Poland.
- C8.** **Erel-Goktepe, I.**; Yusan, P.; Bütün, V.; Demirel A.L. “Layer-by-Layer Films of Zwitterionic Micelles” 2<sup>nd</sup> International Conference on Bioinspired and Biobased Chemistry and Materials, 2014, Nice, France.
- C9.** **Erel-Goktepe, I.**; Yusan, P.; Hippus, C.; Bütün, V.; Demirel A.L. “Ultra-thin Films of Polyzwitterionic Micelles” 78<sup>th</sup> Prague Meeting on Macromolecules, 2014, Prague, Czech Republic.
- C10.** **Erel, I.**; Bütün, V.; Demirel, A.L “Strategies to Incorporate Micelles of Selectively Betainized Block Copolymers into Layer-by-layer Films” *ACS National Meeting, Fall 2011, Denver, CO, USA.*
- C11.** **Erel-Unal, I.**; Sukhishvili, S.A. “Biocompatible, Hydrogen-bonded Multilayers of a Polyphenol with High pH-Stability” *ACS 2008 Middle Atlantic Regional Meeting Polymer Division Symposium, 2008, Queens, NY, USA.*
- C12.** Sukhishvili, S.A.; Kharlampieva, E.; **Erel-Unal, I.** “Polymer-Protein Multilayers: Equilibrium and Dynamics” *ACS National Meeting, Fall 2007 Boston, MA, USA.*
- C13.** **Erel-Unal, I.**; Sukhishvili, S.A. “Hydrogen-bonded Multilayers of Tannic Acid: Tuning pH Response” *International Symposium on Stimuli-Responsive Materials, 2007, Mississippi, USA.*
- C14.** Kharlampieva, E.; **Erel-Unal, I.**; Sukhishvili, S.A. “Amphoteric Surface Hydrogels from Hydrogen-Bonded Multilayers: Reversible Protein Uptake” *4<sup>th</sup> International Nanomedicine and Drug Delivery Symposium, 2006, Omaha, NE, USA.*

### **NATIONAL CONFERENCE ABSTRACTS**

- E1.** Onat, B.; Butun, V.; Banerjee, S.; **Erel-Goktepe, I.** “Anti-Biofouling Films Prepared by Layer-by-Layer Formation of Zwitterionic Micelles ” *NanoTR 11, 2015, METU, Ankara.*
- E2.** Sever, O.; Celik, U.; **Erel-Goktepe, I.**; Bayram, G.; Oral A. "Piezoelectric Properties of Layer-by-Layer Films". *NanoTR 11, 2015, METU, Ankara.*
- E3.** **Erel-Goktepe, I.**; Bütün, V.; Demirel A.L “pH ve Sıcaklığa Duyarlı Çok-katmanlı Polimer Filmler” *5<sup>th</sup> National Polymer Conference” 2014, Tokat, Türkiye.*
- E4.** **Erel, I.**; Bütün, V.; Demirel, A. L. “Zwitteriyonik Blok Kopolimer Miseller İçeren Çok-katmanlı İnce Filmler” *26<sup>th</sup> National Chemistry Conference, 2012, Fethiye, Türkiye.*

### **INVITED SEMINARS**

- F1.** METU- Dept. of Chemistry (26.05.2011)
- F2.** Orta Doğu Teknik Üniversitesi – Workshop on New Developments in Biomedical Applications (26.05.2011)
- F3.** TOBB University of Economics and Technology, Ankara (04.10.2011)
- F4.** Eskişehir Osmangazi University- Dept. of Chemistry (12.10.2011)
- F5.** Gazi University - Dept. of Chemistry, Ankara (25.11.2011)
- F6.** National Nanotechnology Research Center-UNAM, Bilkent University, Ankara (16.12.2011)
- F7.** METU Biomedical Engineering Graduate Seminar Series (31.10.2011)
- F8.** METU Biotechnology Graduate Seminar Series (20.12.2011)

**F9.** Erzurum Atatürk University – Dept. of Chemistry (18.05.2012)

**F10.** METU Biochemistry Seminar Series (31.10.2012)

### **THESIS SUPERVISED**

- Meltem Haktanıyan (2016)  
Thesis Title: Stimuli-Responsive Release of Doxorubicin From Layer-by-Layer Films of Poly(2-Isopropyl-2-Oxazoline) and Tannic Acid
- Muhammed Alyaan Ahmed Khan (2014)  
Thesis Title: Preparation and Characterization of Hydrogen-Bonded Layer-by-layer Polymer Films Containing Magnetic Nanoparticles
- Esra Bağ (2014)  
Thesis Title: Zirconium Oxychloride Octahydrate Containing Hydrogen-Bonded Polymer Multilayer Films

### **THESIS CO-SUPERVISED**

- Özlem Sever (2015) Asıl Danışman: Prof.Dr.Göknur Bayram  
Thesis Title: Piezoelectric Properties of Polyelectrolyte Multilayer Films
- Birsu Teoman (2015) Asıl Danışman: Doç.Dr.Gülay Ertuş  
Thesis Title: Use of Gold Nanoparticle containing Poly(allylamine Hydrochloride)/Poly(acrylic Acid) Multilayer Films As SERS Substrates
- Zeynep Gündoğan (2015) Asıl Danışman: Prof.Dr Nesrin Hasırcı  
Thesis Title: Calcium Phosphate Containing Layer-by-Layer Films for Medical Applications

### **PROFESSIONAL SERVICE**

Serving as a referee for the following journals:

- Acta Biomaterialia,
- Journal of Materials Chemistry,
- Soft Matter,
- Journal of Colloid and Interface Science,
- RSC Advances,
- Materials Science and Engineering C,
- Journal of Applied Polymer Science,
- Turkish Journal of Chemistry,
- Journal of Applied Surface Science,
- Designed Monomers and Polymers,
- Colloid and Polymer Science,
- Biomaterials Science.

### **WORK EXPERIENCE**

- Mart 2011- : Assistant Professor/ METU, Dept. of Chemistry Ankara, Türkiye.
- September 2009-February 2011: Postdoctoral Research Fellow, Koç Üniversitesi, Dept. of Chemistry, İstanbul,Türkiye.
- January 2005-May 2009: Teaching and Research Assistant/Stevens Inst. of Technology, Hoboken, NJ, USA.
- April 2001-September 2004: worked in industry.
- September 1999-February 2001: Research Assistant, Istanbul Technical University, İstanbul, Türkiye.