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*Professor in Bioengineering*



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**Academic Positions**

<b>Professor</b>	Marmara University, Istanbul, Turkey Department of Bioengineering June 2013 to present
<b>Associate Professor</b>	Marmara University, Istanbul, Turkey Department of Bioengineering February 2008 to 2013
<b>Assistant Professor</b>	Marmara University, Istanbul, Turkey Department of Bioengineering November 2007 to February 2008
<b>Assistant Professor</b>	Marmara University, Istanbul, Turkey Chemical Engineering Department December 2001 to November 2007

**Education**

**Ph.D.** in Chemical Engineering, Boğaziçi University, Istanbul, Turkey, 2000  
*Production of Taq I Restriction and Modification Enzymes by Using Two Different Expression Systems*  
Supervisor: Prof. Betül Kırdar

**M.Sc.** in Chemical Engineering, Boğaziçi University, Istanbul, Turkey, 1995  
*Cloning and Purification of a Thermostable DNA Polymerase*  
Supervisors: Prof. Z. İlsen Önsan and Prof. Betül Kırdar

**B.S.** in Chemical Engineering, Boğaziçi University, Istanbul, Turkey, 1993

## **Research Interests**

- Fructans and Levan polysaccharide
- Isolation and identification of industrially important microorganisms and extremophiles.
- Systems biology of Microbial biopolymer production
- Metabolic Network-based analysis of Microbial communities: case studies on cheese starter cultures
- Reconstruction and modeling of genome scale metabolic models for design and improvement of bioproduct formation: Case studies on biopolymers and bioethanol.
- Development of production processes for biopolymers that have potential industrial applications. Case study on production of biopolymers from extremophiles.
- Reconstruction and analysis of biological networks (metabolic, protein interaction, transcriptional regulation, etc.) to understand the mechanism behind the cellular processes.
- Production and characterization of bioactive nanostructured drug delivery systems, coatings and nanofibers for biomedical applications.
- Functional foods and ingredients, prebiotics and probiotics.

## **Research Projects (2010 - )**

*Production and Functional Properties of Exopolymer Synthesized by the Halophilic Bacterium Chromohalobacter canadensis 28, Bulgaria/Turkey Joint Project, **Coordinator**, 2018 – 2020.*

*Development of Levan Based Bioadhesives, 2515-Tübitak Project, 116M838, **Coordinator**, 2017 – 2020.*

*ENBA - European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding Technologies, COST Action 15216, **Partner**, 2016 – 2020.*

*Unraveling the Potential Use of Fructans in Cryotechnological Applications, Tübitak Project, MAG-118M607, **Coordinator**, 2018 – 2021.*

*Production of Levan-based Functional Food Ingredients, Tübitak Project, TOVAG-115O495, **Coordinator**, 2015 – 2017.*

*Investigation of extremophilic QS and QQ metabolites to combat bacterial virulence, Turkey/Italy Joint Project, 315S092, **Partner**, 2017-2019.*

*Development of Low-cost Microbial Production Processes for Levan Polysaccharide, Tübitak Project, MAG-114M239, **Coordinator**, 2014 – 2016.*

*Development of Nanostructured Functional Biosurfaces by Laser Direct Writing Technologies, Romania/Turkey Joint Project, **Coordinator** (Turkish side), 2013 – 2015.*

*Extremophiles for Next Generation Biofuels, Turkey/Italy Joint Project, **Coordinator** (Turkish side), 2012 – 2014.*

*High-performing Cell Factories for Next Generation Biofuels, UK/Turkey Knowledge Partnership Programme, **Partner**, 2012 – 2013.*

*Biological Adhesives: From Biology to Biomimetics, COST Action TD0906, **Researcher**, 2009 – 2013.*

*Biological Activities of Levan-based Polymers: In Vitro and In Silico Investigations, Tübitak Project, 111M232, **Coordinator**, 2011 – 2014.*

*Bioethanol - A Source Of Renewable Energy From Extremophiles, Turkey/Italy Joint Project, TBAG-U/192 (106T756), **Coordinator** (Turkish side), 2007 – 2011.*

*Production of Exopolysaccharides from Thermophilic Microorganisms, Tübitak Project, TBAG-110To16, **Coordinator**, 2011 – 2012.*

*System-based Optimization of Microbial Biopolymer Production, Tübitak Project, MAG-110M613, **Supervisor**, 2011 – 2014.*

*Investigation of Potential Industrial Applications of a Novel Microbial Biopolymer*, Tübitak Project, MAG-108M193, **Coordinator**, 2008 – 2010.

*A new generation of nanostructured coatings for biomedical implants applications*, Turkey/Romania Joint Project, TBAG-109T614, **Researcher**, 2010 - 2012.

*Development of System Based in-silico Models for High Yield Biofuel Production and Rational Design of Fuel Cells*, MAG-106M444, **Researcher**, 2007 - 2010.

## **Publications**

### **Book Chapters**

- Sinem Selvin Selvi, Edina Eminagic, M. Yusuf Kandur, Emrah Ozcan, Ceyda Kasavi, Ebru Toksoy Oner, Ch 10 - Research and Production of Microbial Polymers for Food Industry, in Book: **Bioprocessing for Biomolecules Production**, Edited by Gustavo Molina, Vijai Kumar Gupta, Brahma N. Singh, Nicholas Gathergood, 28 October 2019, John Wiley & Sons, Pages 211-231, ISBN 1119434327, 9781119434320.
- Onur Kirtel, Maxime Versluys, Wim van den Ende, Ebru Toksoy Öner, Ch5-Quorum Sensing in Phytopathogenesis, In Book: **Quorum Sensing Molecular Mechanism and Biotechnological Application**, Edited by Giusepinna Tommonaro, 12 April 2019, Academic Press, Pages 127-149, ISBN 978-0-12-814905-8.
- Merve Erginer Hasköylü, Songul Yasar Yildiz, Tuğba Demirci, Juergen Hemberger and Ebru Toksoy Oner, Ch 6 - Glycan-Based Nanocarriers in Drug Delivery, in Book: **Drug Delivery Approaches and Nanosystems**, Volume 2: Drug Targeting Aspects of Nanotechnology, Edited By Raj K. Keservani, Anil K. Sharma, Rajesh K. Kesharwani, 15 November 2017, Apple Academic Press (NY), Pages 167-205, ISBN 9781351846677.
- Merve Erginer Hasköylü, Songul Yasar Yildiz and Ebru Toksoy Oner, Fructan rich diet to improve gut microbiota in disease and health, in Book: **Science within Food: Up-to-date Advances on Research and Educational Ideas**, Edited by A. Méndez-Vilas, Formatex (Spain), Nov 2017, pages 120-131, ISBN-13 Collection: 978-84-947512-1-9
- Ozlem Ateş and Ebru Toksoy Oner, 2017, Microbial Xanthan, Levan, Gellan, and Curdlan as Food Additives, in Book: **Microbial Functional Foods and Nutraceuticals** (eds V. K. Gupta, H. Treichel, V. Shapaval, L. Antonio de Oliveira and M. G. Tuohy), 2017/12/26, John Wiley & Sons, Ltd, Chichester, UK. Pages 149-173, doi: 10.1002/9781119048961.ch7
- Onur Kirtel, Gülben Avşar, Burak Adnan Erkorkmaz and Ebru Toksoy Oner, Ch 12 - Microbial Polysaccharides as Food Ingredients, In Book: **Microbial Production of Food Ingredients and Additives** Edited by: Alexandru Mihai Grumezescu and Alina Maria Holban, Elsevier, Pages 347-383, 15 Aug 2017, <https://doi.org/10.1016/B978-0-12-811520-6.00012-X>, ISBN: 978-0-12-811520-6
- Margarita Kambourova, E. Toksoy Oner, Annarita Poli (2015), Chapter 15: Exopolysaccharides from Prokaryotic Microorganisms—Promising Sources for White Biotechnology Processes, **Industrial Biorefineries and White Biotechnology**, A. Pandey, R. Höfer, M. Taherzadeh, K. M. Nampoothiri and C Larroche (Eds), Pages 523-554, Elsevier USA, ISBN: 978-0-444-63453-5.
- Emrah Özcan and Ebru Toksoy Oner Chapter6: Microbial Production of Extracellular Polysaccharides from Biomass Sources, **Polysaccharides**, Edited by Kishan Gopal Ramawat, Jean-Michel Mérillon, 01/2015: chapter 6: pages 161-184; Springer International Publishing Switzerland., ISBN: 978-3-319-16297-3.
- G. Tommonaro, G.R. Abbamondi, Toksoy Oner, E and Nicolaus B, 2015. Investigating the Quorum Sensing System in Halophilic Bacteria, **Halophiles – Biodiversity and Sustainable Exploitation**, D.K. Maheshwari and M Saraf (Eds), Springer, pp.189-207.
- Songul Yasar Yildiz and Ebru Toksoy Oner (2014). Mannan as a Promising Bioactive Material for Drug Nanocarrier Systems, **Application of Nanotechnology in Drug Delivery**, PhD. Ali Demir Sezer (Ed.), ISBN: 978-953-51-1628-8, InTech, DOI: 10.5772/58413. Available from: Mannan as a Promising Bioactive Material for Drug Nanocarrier Systems | InTechOpen
- H. Kazak, Aneli Barbosa, Boran Baregzay, Mario A. Alves da Cunha, Ebru Toksoy Oner, Robert Dekker, Neelam Khaper (2014) “Chapter: 8. Biological Activities of Bacterial Levan and Three Fungal  $\beta$ -glucans, Botryosphaeran and Lasiodiplodan Under High Glucose Condition in the Pancreatic  $\beta$ -cell line INS-1E” in book: **Adaptation Biology and Medicine (Volume 7: New Challenges)**, Narosa Publishing House, Editors: Laurentiu M. Popescu, Alan R. Hargens, Pawan K. Singal, pp.105-115

- Mihailescu, Ion N., Adriana Bigi, Eniko Gyorgy, Carmen Ristoscu, Felix Sima and Ebru Toksoy Oner "Biomaterial Thin Films by Soft Pulsed Laser Technologies for Biomedical Applications" in **Lasers in Materials Science** E Castillejo, Marta E Ossi, Paolo M.E Zhigilei (Eds), Springer Series in Materials Science, Volume 191, 2014, 271-294.
- E. Toksoy Öner "Microbial Production of Extracellular Polysaccharides from Biomass" in Z. Feng (Ed.) **Pretreatment Techniques for Biofuels and Biorefineries**, Springer, 35-56, 2013.
- H. Kazak, E. Toksoy Öner and R.F.H. Dekker. "Extremophiles as Sources of Exopolysaccharides". **Carbohydrate Polymers: Development, Properties and Applications**, (F. Columbus Ed.) Nova Science Publishers, Inc. NY (USA), 605-619, 2010.

## Reviews

- J Combie, ET Öner, From healing wounds to resorbable electronics, levan can fill bioadhesive roles in scores of markets, *Bioinspiration & Biomimetics* 14 (1), 011001, (2018).
- O Kirtel, M Versluys, Wim Van Ende and E Toksoy Öner, Fructans of the Saline World, *Biotechnology Advances* 36 (5), 1524-1539, (2018).
- Versluys, Maxime, Onur Kirtel, Ebru Toksoy Öner, and Wim Van Ende. "The Fructan Syndrome: Evolutionary Aspects and Common Themes Among Plants and Microbes." *Plant, Cell & environment* (2018), 8 Nov 2017, 41(1), 16-38, DOI: 10.1111/pce.13070.
- Eroglu M.S., Toksoy Öner E., Cansever Mutlu E., Sennaroğlu Bostan M., (2016). "Sugar Based Biopolymers in Nanomedicine; New Emerging Era for Cancer Imaging and Therapy, *Current Topics in Medicinal Chemistry*, Vol 16, 1-10. DOI: 10.2174/15680266166666161222101703.
- Toksoy Öner, E., Hernández, L., Combie, J., Review of Levan polysaccharide: From a century of past experiences to future prospects, *Biotechnology Advances*, 34 (5), 827-844, (2016).
- Yasar Yildiz,S, Pinar Kuru, Ebru Toksoy Oner, and Mehmet Agirbasli. "Functional Stability of Plasminogen Activator Inhibitor-1" *The Scientific World Journal*, Volume 2014, Article ID 858293, 11 pages, <http://dx.doi.org/10.1155/2014/858293>.
- Barbara Nicolaus, Margarita Kambourova and Ebru Toksoy Oner. "Exopolysaccharides from extremophiles: From fundamentals to biotechnology" *Environmental Technology*, 31 (10), 1145-1158 (2010).

## Peer-Reviewed Journal Articles

- Yunis Moukbil, Busra Isindag, Velican Gayir, Burak Ozbek, Merve Erginer Haskoylu, Ebru Toksoy Oner, Faik Nuzhet Oktar, Fakhra Ikram, Mustafa Sengor, Oguzhan Gunduz, 3D Printed Bioactive Composite Scaffolds for Bone Tissue Engineering, *Bioprinting*, Vol 17, March 2020, e00064, (2020).
- F Bahadori, Z Eskandari, N Ebrahimi, MS Bostan, MS Eroğlu, ET Öner, Development and optimization of a novel PLGA-Levan based drug delivery system for curcumin, using a quality-by-design approach, *European Journal of Pharmaceutical Sciences*, 105037, (2019).
- O Kirtel, E Lescrinier, W Van den Ende, ET Öner, Discovery of fructans in Archaea, *Carbohydrate Polymers*, 220, 149-156, (2019).
- MO Aydogdu, J Chou, E Altun, N Ekren, S Cakmak, M Eroglu, AA Osman, Ozlem Kutlu, Ebru Toksoy Oner, Gulben Avsar, Faik Nuzhet Oktar, Ismail Yilmaz, Oguzhan Gunduz, Production of the biomimetic small diameter blood vessels for cardiovascular tissue engineering, *International Journal of Polymeric Materials and Polymeric Biomaterials*, 68 243-255, (2019).
- E Altun, MO Aydogdu, SO Togay, AZ Sengil, N Ekren, ME Haskoylu, Ebru T Oner, Nese A Altuncu, Gurkan Ozturk, Maryam Crabbe-Mann, Jubair Ahmed, Oguzhan Gunduz, Mohan Edirisinghe, Bioinspired scaffold induced regeneration of neural tissue, *European Polymer Journal*, 114, 98-108, (2019).
- GG Haciosmanoğlu, T Doğruel, S Genç, ET Oner, & ZS Can, Adsorptive Removal of Bisphenol A from Aqueous Solutions Using Phosphonated Levan, *Journal of hazardous materials*, (2019).

- EB Gurler, NM Ergul, B Ozbek, N Ekren, FN Oktar, ME Haskoylu, ... & AF Temiz, Encapsulated melatonin in polycaprolactone (PCL) microparticles as a promising graft material, *Materials Science and Engineering: C*, (2019).
- MO Aydogdu, ET Oner, N Ekren, G Erdemir, SE Kuruca, E Yuca, ... & O Gunduz, Comparative characterization of the hydrogel added PLA/ $\beta$ -TCP scaffolds produced by 3D bioprinting, *Bioprinting*, e00046, (2019).
- E Özcan, SS Selvi, E Nikerel, B Teusink, ET Öner & Çakır, T, A genome-scale metabolic network of the aroma bacterium *Leuconostoc mesenteroides* subsp. *cremoris*, *Applied microbiology and biotechnology*, 1-13, (2019).
- N Mihailescu, ME Haskoylu, C Ristoscu, MS Bostan, M Sopronyi, et al. Gradient multifunctional biopolymer thin film assemblies synthesized by combinatorial MAPLE, *Applied Surface Science* 466, 628-636, (2019).
- S Ozdemir, E Kilinc, ET Oner, Preconcentrations and determinations of copper, nickel and lead in baby food samples employing *Coprinus silvaticus* immobilized multi-walled carbon nanotube as solid phase sorbent, *Food chemistry* 276, 174-179, (2019).
- A Abea, T Ushiyama, ET Oner, & N Shimizu, Production of fructo-oligosaccharides from levan treated with compressed hot water fluids, In *Basic & Clinical Pharmacology & Toxicology* (Vol. 124, pp. 48-49). 111 River St, Hoboken 07030-5774, NJ USA: Wiley, (2018).
- MO Aydogdu, J Chou, E Altun, N Ekren, S Cakmak, M Eroglu, AA Osman, ..., Production of the biomimetic small diameter blood vessels for cardiovascular tissue engineering, *International Journal of Polymeric Materials and Polymeric Biomaterials*, 1-13, (2018).
- G Avsar, D Agirbasli, MA Agirbasli, O Gunduz, ET Oner, Levan based fibrous scaffolds electrospun via co-axial and single-needle techniques for tissue engineering applications, *Carbohydrate polymers* 193, 316-325, (2018).
- S Tohme, GG Haciosmanoğlu, MS Eroğlu, C Kasavi, S Genç, ZS Can, ET Oner, *Halomonas smyrnensis* as a cell factory for co-production of PHB and levan, *International journal of biological macromolecules* 118, 1238-1246, (2018).
- O Kirtel, C Menéndez, M Versluys, W Van den Ende, L Hernández, ET Oner, Levansucrase from *Halomonas smyrnensis* AAD6T: first halophilic GH-J clan enzyme recombinantly expressed, purified, and characterized, *Applied microbiology and biotechnology* 102 (21), 9207-9220, (2018).
- BA Erkorkmaz, O Kirtel, ÖA Duru, ET Öner, Development of a cost-effective production process for *Halomonas* levan, *Bioprocess and biosystems engineering*, 1-13, (2018).
- B Aydin, T Ozer, ET Oner, KY Arga, The Genome-based metabolic systems engineering to boost levan production in a halophilic bacterial model, *Omics: a journal of integrative biology* 22 (3), 198-209, (2018).
- Tiago D Gomes, Sofia G Caridade, Maria P Sousa, Sara Azevedo, Muhammed Y Kandur, Ebru T Öner, Natália M Alves, João F Mano, Adhesive free-standing multilayer films containing sulfated levan for biomedical applications, *Acta biomaterialia*, 69, 183-195, (2018).
- Berg, Albrecht, Ebru Toksoy Oner, Joan Combie, Bernd Schneider, Renate Ellinger, Jürgen Weisser, Ralf Wyrwa, Matthias Schnabelrauch, Formation of new, cytocompatible hydrogels based on photochemically crosslinkable levan methacrylates, In *International Journal of Biological Macromolecules*, Volume 107, Part B, 2018, Pages 2312-2319, ISSN 0141-8130, <https://doi.org/10.1016/j.ijbiomac.2017.10.120>.
- Queiroz, Eveline A.I.F., Zuleica B. Fortes, Mário A.A. da Cunha, Hande Kazak Sarilmiser, Aneli M. Barbosa Dekker, Ebru Toksoy Öner, Robert F.H. Dekker, Neelam Khaper, Levan promotes antiproliferative and pro-apoptotic effects in MCF-7 breast cancer cells mediated by oxidative stress, In *International Journal of Biological Macromolecules*, Volume 102, 2017, Pages 565-570, ISSN 0141-8130, <https://doi.org/10.1016/j.ijbiomac.2017.04.035>.
- Osman, A., Ebru Toksoy Oner, Mehmet S. Eroğlu, (2017). Novel levan and pNIPA temperature sensitive hydrogels for 5-ASA controlled release, *Carbohydrate Polymers*, Volume 165, 2017, 61–70.
- Mutlu, Esra Cansever, Fatemeh Bahadori, Muge Sennaroglu Bostan, Abdurrahim Kocyigit, Ebru Toksoy Oner, Mehmet S. Eroğlu, (2016). Lecithin-acrylamido-2-methylpropane sulfonate based crosslinked phospholipid nanoparticles as drug carrier, *Journal of Applied Polymer Science*, 133(42), 1-12. DOI: 10.1002/app.44105.
- Erginer, M., Akcay, A., Coskun, B., Morova, T., Rende, D., Bucak, S., Baysal, N., Ozisik, R., Eroglu, M. S., Agirbasli, M., Toksoy Oner, E., Sulfated levan from *Halomonas smyrnensis* as a bioactive, heparin-mimetic glycan for cardiac tissue engineering applications, *Carbohydrate Polymers*, Volume 149, 2016, 289–296 (2016).
- Abbamondi G.R., Suner S., Cutignano A., Grauso L., Nicolaus B., Toksoy Oner E. and Tommonaro G. Identification of N-Hexadecanoyl-L-homoserine lactone (C16-AHL) as signal molecule in halophilic bacterium *Halomonas smyrnensis* AAD6. (2016) *Annals of Microbiology*, DOI: 10.1007/s13213-016-1206-6.
- Ceyda Kasavi, Serpil Eraslan, Ebru T Oner, Betül Kirdar: An integrative analysis of transcriptomic response of ethanol tolerant strains to ethanol in *Saccharomyces cerevisiae*. *Molecular BioSystems*, Jan 26;12(2):464-76, 01/2015; 10.1039/C5MB00622H (2016).

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- Sezer, Ali Demir, Hande Kazak Sarılmışer, Erkan Rayaman, Adile Çevikbaş, Ebru Toksoy Öner, Jülide Akbuğa: Development and characterization of vancomycin-loaded levan-based microparticulate system for drug delivery. *Pharmaceutical Development and Technology* 11/2015; DOI:10.3109/10837450.2015.1116564 (2015).
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- Yasar Yildiz S., Radchenkova N, Arga KY, Kambourova M, E Toksoy Oner, Genomic analysis of *Brevibacillus thermoruber* 423 reveals its biotechnological and industrial potential. *Applied Microbiology and Biotechnology*, 10.1007/s00253-015-6388-5, 99(5):2277-89 (2015).
- Kazak Sarilmiser H, Ates O, Ozdemir G, Arga KY, Toksoy Oner E. Effective stimulating factors for microbial levan production by *Halomonas smyrnensis* AAD6T. *Journal of Bioscience and Bioengineering*, 119(4):455-63, (2015).
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- Finore I, Donato PD, Poli A, Kirdar B, Kasavi C, Toksoy Oner E., Nicolaus B, Lama L. (2014) Use of Agro Waste Biomass for  $\alpha$ -Amylase Production by *Anoxybacillus amyolyticus*: Purification and Properties. *J Microb Biochem Technol* 6(6): 320-326. doi:10.4172/1948-5948.1000162
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