



# Assoc. Prof Dr. İlker Polatoğlu

**BIOSENS ID BIOTECHNOLOGY INDUSTRY AND INCORPORATED COMPANY**



**BIOSENS ID**

## CONTACT INFORMATION

<b>Address</b>	Manisa Celal Bayar University, Faculty of Engineering, Bioengineering Department, Yunusemre, Manisa, 45140, Turkey	
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## EDUCATION

Degree	University	Department/Program	Years
Ph.D.	Izmir Institute of Technology	Chemical Engineering	2005-2012
Master	Izmir Institute of Technology	Chemical Engineering	2002-2005
B.Sc.	Yüzüncü Yıl University	Food Engineering	1996-2000

## RESEARCH INTERESTS

1	Development of electrochemical and optical biosensors
2	Detection of viruses, cancer biomarkers, phenolic compounds, pesticides, pathogens, food additives, GMO and heavy metals by biosensors
3	Enzyme kinetics, enzyme immobilizations, cross linked enzyme aggregates (CLEA)
4	Modelling and optimization
5	Modification and characterization of zeolites, Chemical behavior of natural zeolites in acidic, basic solutions and also synthetic gastric juice
6	Proton transfer mechanisms

## THESIS

Ph.D.	Preparation of Tyrosinase Immobilized Chitosan and Gelatin Films for Detection of Parathion-Methyl
Master	Chemical Behavior of Clinoptilolite Rich Natural Zeolite in Aqueous Medium

## AWARDS AND HONORS

1	Certificate of Appreciation given due to receiving the support of TUBITAK 1001 project, Manisa-Turkey, 2019
2	The second-place poster presentation: 13. National Chemical Engineering Congress, Van-TURKEY, 2018
3	The first-place poster presentation: 7. National Chemical Engineering Congress, Eskişehir-TURKEY, 2006
4	The first place of undergraduate students in food engineering department, Yüzüncü Yıl University, 2000

## EXPERIENCE

Title	University	Position/Research Topics	Years
Assoc. Prof. Dr.	Manisa Celal Bayar University	"Bioengineering Department"	2021-present
Assist Prof. Dr.	Manisa Celal Bayar University	"Bioengineering Department"	2012-2021
Graduate Research Assistant	Izmir Institute of Technology	"Preparation of Tyrosinase Immobilized Films"	2005-2011
Research Assistant	Izmir Institute of Technology	"Chemical Behavior of Natural Zeolites in Acidic and Basic Medium"	2003-2005

## PROJECTS

Position	Supported by	Title
Project Manager	Scientific and Technical Research Council of Turkey (TÜBİTAK 1512), 2021-	Development and production of the Glu-COV ID test kit for the diagnosis of COVID-19
Project Assistant	Scientific and Technical Research Council of Turkey (TÜBİTAK 1001), submitted	Production of an Innovative mRNA-Based Immunocastration Vaccine and Investigation of in vivo Vaccine Efficacy in Male Rats with Chitosan Hydrogel
Project Assistant	Scientific and Technical Research Council of Turkey (TÜBİTAK 1002), 2021- Project Number: 121M744	Production and Characterization of a Functional Wound Dressing Material with Centaury Oil and Gentamycin from Okra Mucilage
Project Manager	Scientific and Technical Research Council of Turkey (TÜBİTAK 1001), 01.02.2020 - Project Number:119Z380	Development of DNA-Inorganic Hybrid Based Nanomaterials as a Signal Platform for Detection of Nucleotide Sequences by Personal Glucose Meters
Project Manager	Scientific Research Project, Manisa Celal Bayar University (BAP), 06.11.2019 - 04.08.2021 Project Number: 2019-142	Development of Electrochemical DNA Biosensor for Rapid and Sensitive Determination of GMO

<b>Project Manager</b>	Scientific Research Project, Manisa Celal Bayar University (BAP), 01.11.2017-24.01.2019 Project Number: 2017-146	Dedection of Some Food Additives and Pesticides by Magnetite Cross Linked Tyrosinase Enzyme Aggregates
<b>Project Assistant</b>	Scientific and Technical Research Council of Turkey (TÜBİTAK), 15.05.2017 - 22.01.2019 Project Number:216Z033	siRNA Transfection and GFP Silencing using pHEMA-Chitosan Composite Nanospheres
<b>Project Assistant</b>	Scientific Research Project, Manisa Celal Bayar University (BAP), 25.05.2017-27.09.2018, Project Number: 2017-015	Development of Efficient Drug Delivery Vehicles Against Prostate Cancer Cells by Using pHEMA-Chitosan Composite Nanospheres
<b>Project Manager</b>	Scientific Research Project, Masnisa Celal Bayar University (BAP), 24.06.2016-24.12.2016, Project Number: 2016-102	Preparation and Characterization of Carbon Paste Electrode for Electrochemical Biosensor
<b>Project Manager</b>	Scientific and Technical Research Council of Turkey (TÜBİTAK), 01.10.2014-23.06.2017, Project Number:114Z417	Development of Magnetite-Chitosan Nanocomposite Based Electrochemical Enzyme Sensor for Determination of Pesticide Residue
<b>Project Consultant</b>	KOSGEB	Production of Herbal Ester Based Hydraulic System Oil
<b>Project Manager</b>	Scientific Research Project, Manisa Celal Bayar University (BAP), 01.04.2013-01.04.2015, Project Number: 2013-022	“Setting up Bioengineering Research Labotarory”
<b>Project Assistant</b>	Scientific Research Project, Manisa Celal Bayar University (BAP), 2014-2015, Project Number: 2014-035	“Preparation and Characterization of Biocatalytic Membranes”
<b>Project Assistant</b>	Scientific Research Project, Izmir Institute of Technology (BAP), 2009-2011, Project Number: 2009İYTE06	“Development of Enzyme Electrode for Pesticides”
<b>Project Assistant</b>	Scientific Research Project, Izmir Institute of Technology (BAP), 2004-2005 Project Number: 2004İYTE06	“Chemical Behavior of Natural Zeolites in Acidic and Basic Medium”

### **COURSES TAUGHT**

<b>1</b>	Fluid Mechanics, 2012-present.
<b>2</b>	Stoichiometry, 2016-present
<b>3</b>	Biosensors, 2013-present

4	Graduation project, 2020-present
5	Design Project, 2014- 2020
6	Biomimetic, 2013-present
7	Bioengineering Laboratory I, 2016 – 2017
8	Percussion, 2017- 2019
9	Biomaterials, 2014-2016
10	Organic Chemistry, 2013-2015
11	Process Control, 2012-2014
12	General Chemistry, 2012-2016

### **PUBLICATIONS (SCI & SCI EXPANDED)**

1	<b>Polatoğlu İ.</b> , Yardım A., “Portable Quantification of Silver Ion by Using Personal Glucose Meter (PGM) and Magnetite Cross-Linked Invertase Enzyme Aggregates (MCLIA)”, Analytical Biochemistry, 2021, (under review)
2	<b>Polatoğlu İ.</b> , Yardım A., “Determination of Effective Assay Parameters on the activity of Magnetite Cross-Linked Invertase Aggregates by Personal Glucose Meter”, Biocatalysis and Biotransformation, Published online: 27 Jan 2021
3	Ceylan, A.B., Aydın, L., Mamur, H., Nil, M., <b>Polatoğlu, İ.</b> , Sözen, H., “A New Hybrid Approach In Selection of Optimum Establishment Location of The Biogas Energy Production Plant”, Biomass Conversion and Biorefinery, Published online: 10 May 2021
4	<b>Polatoğlu İ.</b> , Aydın L., “A New Design Strategy with Stochastic Optimization on The Preparation of Magnetite Cross-Linked Tyrosinase Aggregates (MCLTA)”, Process Biochemistry, 99, 131-138, 2020
5	<b>Polatoğlu İ.</b> , Aydın L., Nevruz B.Ç., Özer S. “A Novel Approach on Optimal Design of A Biosensor”, Analytical Letters, 53 (9), 1428-1445, 2020
6	<b>Polatoğlu İ.</b> , Karataş D., “Modeling of Molecular Interaction between Catechol and Tyrosinase by DFT”, Journal of Molecular Structure, 1202, 127192, 2020
7	<b>Polatoğlu İ.</b> , “Electrochemical Sensing Platform Based on Tyrosinase Immobilized Magnetite Chitosan Nanobiocomposite Film and Its Application as Phenol Biosensors”, Journal of the Electrochemical Society, 166 (15), 1620-1629, 2019
8	<b>Polatoğlu İ.</b> , Özkan F., “Development of An Optical Tyrosinase Biosensor (TCA) for Detection of “Parathion-Methyl”, Sensor Review, 39/4, 604–611, 2019
9	Asal M., Özen Ö. Şahinler M., Baysal H.T. <b>Polatoğlu İ.</b> , “An Overview of Biomolecules, Immobilization methods and Support Materials for Biosensors”, Sensor Review, 39/3, 377–386, 2019
10	Asal M., Özen Ö. Şahinler M., <b>Polatoğlu İ.</b> , “Recent Developments in Enzyme, DNA and Immuno-Based Biosensors”, Sensors, 18 (6), 1924, 2018
11	<b>Polatoğlu I.</b> , Çakıcıoğlu-Özkan, F., Aqueous Interactions of Zeolitic Material in Acidic and Basic Solutions, Microporous and Mesoporous Materials, 132 (1-2), 219-225, 2010
12	Çakıcıoğlu-Özkan, F., <b>Polatoğlu I.</b> , Kinetics of Proton Transfer in The Zeolitic Tuff, Central European Journal of Chemistry, 7 (3), 508-51, 2009

## PUBLICATIONS (OTHERS)

1	<b>Polatođlu I.</b> , "Elektrokimyasal Biyosensörler için Karbon Pasta Elektrot Tasarımı ve karakterizasyonu" Süleyman Demirel Üniversitesi, Fen Bilimleri Enstitüsü Dergisi, 22, 141-148, 2018
2	Kızılkaya M., Eren Ü., <b>Polatođlu I.</b> , "Development of a Gold Nanoparticle-Based Electrochemical Biosensor for Detection of Phenolic Compounds", Journal of Turkish Chemical Society B Chemical Engineering (JOTCS), 1(1), 115-126, 2017
3	<b>Polatođlu I.</b> , "Tirozinaz Enzim Aktivitesi Üzerine Reaksiyon Parametre Etkilerinin UV Spektrofotometre ile Yerinde Analiz Edilmesi", Manisa Celal Bayar Üniversitesi Fen Bilimleri Dergisi, 12(2), 319-325, 2016
4	Baştürk S.B., Kanbur K., <b>Polatođlu I.</b> , Yürekli Y., "Mechanical Properties of Acorn and Pine Cone Filled Polymer Composites", American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS), 14(2), 144-153, 2015
5	<b>Polatođlu I.</b> , Yürekli Y. Baştürk S.B., Estimating Solubility of Parathion in Organic Solvents", Afyon Kocatepe Üniversitesi Fen ve Mühendislik Bilimleri Dergisi, 15 (3), 1-5, 2015
6	Yürekli Y. <b>Polatođlu I.</b> , Baştürk S.B., Filtrasyon Membranları Üretim ve Karakterizasyon Yöntemleri, Manisa Celal Bayar Üniversitesi Fen Bilimleri Dergisi, 11(2), 175-181, 2015

## PROCEEDINGS

1	Kızılkaya M., Eren, Ü., <b>Polatođlu I.</b> , "Fenolik Bileşiklerin Tayin Edilmesi İçin Altın Nanoparçacıklar İle Zenginleştirilmiş Elektrokimyasal Bir Biyosensörün Geliştirilmesi" 12. Ulusal Kimya Mühendisliği Kongresi (UKMK2016), Wyndham Grand Hotel, İzmir, 2016
2	Yalamaç E., <b>Polatođlu I.</b> , Sütçü M., "Effect of Hollow Ceramic Microspheres on Thermal Conductivity Models and Compressive Strength of Epoxy Composites" 16 <sup>th</sup> International Materials Symposium (IMSP,2016), Pamukkale University, Denizli, 2016
3	Yalamaç E., <b>Polatođlu I.</b> , Sütçü M., "Evaluation of Thermal Conductivity Models and Compressive Strength of Hollow Ceramic Microsphere Filled Polyester Matrix Composites" 16 <sup>th</sup> International Materials Symposium (IMSP,2016), Pamukkale University, Denizli, 2016
4	<b>Polatođlu I.</b> , Çakıcıođlu-Özkan F., "Modification of Natural Zeolite to Enhance Its Neutralizing Capacity in Lactic Acid Medium" International Porous and Powder Materials Symposium and Exhibition (PPM 2013), Cesme Izmir, Turkey, 2013
5	<b>Polatođlu I.</b> , Çakıcıođlu-Özkan F., "The Buffering Effect of Natural Zeolite on Gastric Disturbance", 6 <sup>th</sup> Chemical Engineering Conference for Collaborative Research in Eastern Mediterranean Countries- EMCC06, Antalya-Turkey, 2010
6	<b>Polatođlu I.</b> , Çakıcıođlu-Özkan F., "Klinoptilolitçe Zengin Doğal Zeolitin Sulu Ortamlardaki Kimyasal Davranışları", 12. Ulusal Kil Sempozyumu, Yüzüncü Yıl Üniversitesi, VAN, 2005

## BOOK CHAPTER

1	<b>Polatođlu I.</b> , Erođlu E., Aydın L., "Quantum Dots for Bioelectrochemical Applications" Bioelectrochemical Interface Engineering, WILEY, Chapter 24, 485-505, 2019
2	<b>Polatođlu I.</b> , Erođlu E., "Electrochemical DNA Biosensors" The Most Recent Studies in Science and Art. Chapter 126, 1635-1645, 2018

## PRESENTATIONS PRESENTED AT INTERNATIONAL MEETINGS

1	<b>Polatođlu İ.</b> , Yardım, A., "Detection of Heavy Metals by Magnetite Cross-Linked Enzyme Aggregates (MCLEA)' 3rd International Conference on Bioresource Technology 2021 (BIORESTEC), 2021
2	Yardım, A., Erođlu E., B., <b>Polatođlu I.</b> , "Investigation of rotation speed in the spin coating of biocomposite materials designed for biosensor applications", 9. INTERNATIONAL MOLECULER BIOLOGY AND BIOTECHNOLOGY CONGRESS, Kars, Turkey, 2020
3	<b>Polatođlu İ.</b> , Yardım, A., Günay, B., "Preparation of Novel Magnetite Cross-Linked Invertase Aggregates as A Signal Platform, II. International Enzyme and Bioprocess Days (EBDays 2020), Gebze, Turkey, 2020
4	<b>Polatođlu I.</b> , Yardım, A., "Detection of CA15-3 in Artificial Saliva by Electrochemical Biosensor", 4 <sup>th</sup> International Congress on Biosensors, Çanakkale, Turkey, 2019
5	<b>Polatođlu I.</b> , Sahinler M., "Detection of Food Additives by Magnetite Cross-Linked Tyrosinase Enzyme Aggregates", EastWest Chemistry Conference (EWCC), Lviv-Ukraine, 2018
6	<b>Polatođlu I.</b> , Kızılkaya M., Ayđan E.B., "The Effect of Nanomaterials on Electrochemical Sensing Performance" 14 <sup>th</sup> Nanoscience and Nanotechnology Conference (NANOTR-14), İzmir-Turkey, 2018
7	<b>Polatođlu I.</b> , Sahinler M., "Preparation of Novel Magnetite Nanoparticle Cross-Linked Tyrosinase Aggregates", 13 <sup>th</sup> Nanoscience and Nanotechnology Conference (NANOTR-13), Antalya-Turkey, 2017
8	<b>Polatođlu I.</b> , "Preparation and Characterization of Electrochemical Tyrosinase Biosensor", 232 <sup>nd</sup> Electrochemical Society (ECS) Meeting, National Harbor, MD - USA, 2017
9	<b>Polatođlu I.</b> , "Enhancement of Electrochemical Sensing Performance by Nanomaterials", 1. International University Industry Cooperation, R&D and Innovation Congress, Manisa-Turkey, 2017
10	Yalamaç E., <b>Polatođlu İ.</b> , Sütçü M., Erbaş S.Ç., "Characterization and Modification of Hollow Mullite Microspheres For The Application Of Polymer-Matrix Composites", International Porous and Powder Materials (PPM 2017), Kuşadası-Turkey, 2017
11	<b>Polatođlu I.</b> , "Tyrosinase Based Amperometric Biosensor for Residue Analysis of Pesticide", 9 <sup>th</sup> European Conference on Pesticides and Related Organic Micropollutants in the Environment and 15 <sup>th</sup> Symposium on Chemistry and Fate of Modern Pesticides, Santiago de Compostela- Spain, 2016
12	<b>Polatođlu I.</b> , "The Design of Enzymatic Biosensor For Amperometric Detection of Phenolic Compound", 2 <sup>nd</sup> International Congress on Biomaterials & Biosensors (BIOMATSEN 2016), İstanbul-Turkey, 2016
13	<b>Polatođlu I.</b> , "Phenol Biosensor Developed by Tyrosinase Immobilization on Chitosan-Magnetite Nanobiocomposite Support", 1 <sup>st</sup> International Conference on Green Chemistry and Sustainable Technologies (GCSTI), Izmir-Turkey, 2015
14	<b>Polatođlu I.</b> , "Detection of Pesticide by Electrochemical Tyrosinase Biosensor", 7 <sup>th</sup> International Symposium on Recent Advances in Food Analysis, (RAFA 2015), Prague, Czech Republic, 2015
15	<b>Polatođlu I.</b> , Akçair M., "Development of Tyrosinase Immobilized Chitosan Films for Electrochemical Detection of Phenols", 2 <sup>nd</sup> International Congress on Biosensors, Izmir-Turkey, 2015
16	<b>Polatođlu I.</b> , Çakıcıođlu-Özkan F., "The Influence of Temperature, pH and Organic Solvents on Tyrosinase Activity", International Conference on Enzyme Science and Technology ICEST 2011, Kusadasi-Turkey, 2011
17	<b>Polatođlu I.</b> , Çakıcıođlu-Özkan F., "Tyrosinase-Fe <sub>3</sub> O <sub>4</sub> -Chitosan Nanobiocomposite Film for Biosensor Applications", NANOTR6, İzmir-Turkey, 2010

## PRESENTATIONS PRESENTED AT NATIONAL MEETINGS

1	<b>Polatođlu İ.</b> , Temel H.C.” Üre Tayinine Yönelik Karbon Pasta Elektrot Tasarımı, 13. Ulusal Kimya Mühendisliđi Kongresi, Van, 2018
2	<b>Polatođlu İ.</b> , Tařkın N., Karakař N., “Gözyařından Üre Tayin Edebilen Elektrokimyasal Bir Enzim Sensörünün Geliřtirilmesi”, 13. Ulusal Kimya Mühendisliđi Kongresi, Van, 2018
3	Eren, Ü., <b>Polatođlu İ.</b> , “Çok Duvarlı Karbon Nanotüplerin (MWCN) Biyosensör Sinyalleri Üzerine Etkisi”, 4. Ulusal Uygulamalı Elektrokimya Lisansüstü Yaz Okulu ve Çalıřtayı, Manisa, 2016
4	<b>Polatođlu İ.</b> , “The Investigation of Fe <sub>3</sub> O <sub>4</sub> Effect on Electrochemical Response of Tyrosinase - Chitosan biocomposite Film for Biosensor Application”, Uluslararası Katılımlı Elektrokimya Çalıřtayı, Nanoyapı Modifiye Elektrokimyasal ve Biyoelektrokimyasal Sistemler, Muđla, 2013
5	<b>Polatođlu İ.</b> , Çakıcıođlu-Özkan F., “Holandit-Klinoptilolit Doğal Zeolitinin Asit Ortamındaki Proton Transfer Mekanizmaları”, 9. Ulusal Kimya Mühendisliđi Kongresi, Gazi Üniversitesi, Ankara, 2010
6	Sancaklı S., Sarıbař H., <b>Polatođlu İ.</b> , Çakıcıođlu-Özkan F. “Effect of Ultrasound on The Preparation of Lithium and Silver Rich NaX Zeolite” , SOMER Sempozyumu, ODTU, Ankara, 2007
7	Karacıđa M.Y., Çinar S., <b>Polatođlu İ.</b> , Çakıcıođlu-Özkan F., “Zeolitın Yapay Mide Sıvısındaki Davranıřı”, 7. Ulusal Kimya Mühendisliđi Kongresi, Anadolu Üniversitesi, Eskiřehir, 2006
8	Turan O., <b>Polatođlu İ.</b> , Ertan A., Çakıcıođlu-Özkan F., “ H <sub>3</sub> PO <sub>4</sub> ile İşlem Görmüş Doğal Zeolitlerin Karakterizasyonu”, 6. Ulusal Kimya Mühendisliđi Kongresi, ÖP-25, Bildiri Özetleri Kitabı, İzmir, 2004

## PROFESSIONAL DEVELOPMENT

1	Euroanalysis 2019, Invited participant, İstanbul, 2019
2	Referee in Journal of The Electrochemical Society, 2019-
3	Referee in Gümüşhane Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 2019-
4	Referee in Sensors, 2018-
5	Referee in Cumhuriyet Science Journal, 2018-
6	Referee in Erzincan Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 2018-
7	Referee in Journal of Food Biochemistry, 2017-
8	Referee in XIII. Ne Üretelim Proje Yarıřması at 12. UKMK, İzmir, 2016
9	Turkey Symposium Series: Catalysis and Sensing for Health – İzmir, 2015
10	Training of Active Report Writing for the Invitation of TUBITAK 1001 Project, Manisa, 2015
11	Workshop, New Horizons In Biocatalysis For Biomaterials (BIOCAT-Mat), İzmir, 2014
12	Potentiostat- Galvanostat Training Certificate, Metrohm Company, Manisa-Turkey, November 2014,

## ***PROFESSIONAL MEMBERSHIP***

- |          |   |
|----------|---|
| <b>1</b> | The chamber of food engineering                                       |
| <b>2</b> | Member of Optimization Modelling Applied Math Research Group (OMA-RG) |
| <b>3</b> | Advisory board of DEFAM in Manisa Celal Bayar University              |

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