



TAGEM
R&D AND INNOVATION

Field Crops Central Research Institute,
Biotechnology Research Center /ANKARA

BURCU GÜNDÜZ ERGÜN, PhD

Food Engineer

EDUCATION

- PostDoc**
2021-ongoing
Bilkent University
National Nanotechnology Research Center
- PhD**
2012-2018
Middle East Technical University
Department of Biotechnology
- MSc**
2011-2013
University of Edinburgh
Department of Biotechnology
- MSc**
2011-2013
Middle East Technical University
Department of Biotechnology
- Bachelor's Degree**
2005-2010 (Major)
Hacettepe University
Department of Food Engineering
- Bachelor's Degree**
2005-2010 (Minor)
Hacettepe University
Department of Chemical Engineering

CAREER

- 2021-present: Postdoctoral researcher, Bilkent University,
National Nanotechnology Research Center (UNAM)
- 2021-present: Part-time Faculty, Middle East Technical
University, Department of Chemical Engineering
- 2014-present: Food Engineer, Republic of Turkey Ministry of
Agriculture and Forestry, Biotechnology Research Center,
Ankara
- 2017-2018: Visiting Scientist, University of Natural Resources
and Life Sciences (BOKU), Institute of Biotechnology, Vienna,
Austria

LANGUAGE

English
YÖKDİL 95 / TOEFL 89/ IELTS 7.5


ABOUT ME

I'm a food engineer with a minor degree in chemical engineering. I've experience in engineering genetic tools for non-conventional yeast *Pichia pastoris* to enhance recombinant protein production. I've mainly studied on transcriptional engineering of the yeast by promoter engineering or rewiring novel transcriptional networks by modifying transcription factors.

My current research interests focus on synthetic biology applications of *P. pastoris* via CRISPR/Cas9 system, and engineering probiotic yeast *Saccharomyces boulardii* to design living therapeutics.

CONTACT

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PROJECTS

1. Probiotic Yeast Host Development for Living Therapeutics/ TÜBİTAK 2218 (2022-2024) (Postdoctoral researcher)
2. Gıda Endüstrisinde Yüksek Potansiyele Sahip Transglutaminaz Enzimi Üretimi İçin *Pichia pastoris* Mayası ile Biyoproses Geliştirilmesi/ TAGEM/HSGYAD/A/18/A3/P7/453 (2018-2022) (Project Executive)
3. Ege Bölgesi *Rhizobium* Bakteri Suşlarının Toplanması, Değerlendirilmesi ve Seleksiyonu/TAGEM (2018-2022) (Researcher)
4. TRANSCRIPTPROM - Integrative and comparative analyses of response of *Pichia pastoris*/EU-IBISBA/(2018-2019) (Researcher)
5. Engineering of Alcohol Dehydrogenase-1 Promoter And Recombinant Therapeutic Protein Production By The Enhanced Promoter in *Pichia pastoris* /TÜBİTAK 1001/(2017-2019) (PhD Student)
6. *Pichia pastoris* Alkol Dehidrojenaz 1 Promotoru ile Rekombinant Protein Üretimi/ODTÜ-BAP/(2017-2019) (PhD Student)
7. Metabolik Mühendislik Yöntemleriyle Geliştirilmiş *Pichia pastoris* ile Rekombinant Transglutaminaz Üretilmesi/ODTÜ BAP/(2010-2012) (MSc Student)
8. Gıda Katkı Maddelerinin Dinamik Davranışının Modellenmesi: Et Ürünlerindeki Nitrit Difüzyon Katsayısının Optimizasyonu/TÜBİTAK 2209-A/ (2009-2010) (Project Executive)

PROJECTS UNDER EVALUATION

1. Makarnada Ekmeklik Buğday (*Triticum aestivum*) Tespiti ve Miktar Tayini Sağlayan RT-qPCR Kiti Geliştirilmesi/TAGEM/ (Project Executive)
2. İşlenmiş Et Ürünlerinde Tür Orijin Tayini için Kit Geliştirilmesi/ TAGEM/ (Project Executive)
3. GDO Tayini için Yerli RT-PCR Kiti Geliştirilmesi/ TAGEM/ (Project Executive)



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PUBLICATIONS

PATENTS

- Çalık P., **Ergün B.G.**, ‘‘Modified AOX1 Promoter Variants’’ Publication number: WO/2020/068018, CN112714791, EP3824084, US17276168, JP2021515090 . (Under evaluation)
- Çalık P., **Ergün B.G.**, ‘‘Design of Alcohol Dehydrogenase 2 (ADH2) Promoter Variants by Promotor Engineering’’ Publication number: WO/2020/068019, EP3824083, CN112739819, US20210309990, JP2021515127 (Under evaluation)

SCI, SSCI, SCIE JOURNAL ARTICLES

- Ata Ö, **Ergün BG**, Fickers P, Heisting L, Mattanovich D, Rebnegger C, Gasser B. 2021. What makes *Komagataella phaffii* non-conventional? *FEMS Yeast Research*, foab059, <https://doi.org/10.1093/femsyr/foab059>
* **The 2021 best article award from FEMS Yeast Research**
- **Ergün BG**, Berrios J, Binay B, Fickers P. 2021. Recombinant protein production in *Pichia pastoris*: From transcriptionally redesigned strains to bioprocess optimization and metabolic modelling, *FEMS Yeast Research*, foab057, <https://doi.org/10.1093/femsyr/foab057>
- Watkins CA, Bartley DJ, **Ergün BG**, Yıldızhan B, Ross-Watt T, Morrison AA, Rosales Sanmartín MJ, Strathdee F, Andrews L, Free A. 2021. Interactions between *Teladorsagia circumcincta* Infections and Microbial Composition of Sheep with or without Successful Monepantel Treatment—A Preliminary Study. *Ruminants*. 1(1):31-45. <https://doi.org/10.3390/ruminants1010003>
- **Ergün, B.G.**, Demir, İ., Özdamar, T.H., Gasser, B., Mattanovich, D. and Çalık, P., 2020. Engineered Deregulation of Expression in Yeast with Designed Hybrid-Promoter Architectures in Coordination with Discovered Master Regulator Transcription Factor. *Advanced Biosystems*, 4(4), p.1900172.
- **Ergün, B.G.**, Gasser, B., Mattanovich, D. and Çalık, P., 2019. Engineering of alcohol dehydrogenase 2 hybrid-promoter architectures in *Pichia pastoris* to enhance recombinant protein expression on ethanol. *Biotechnology and Bioengineering*, 116(10), pp.2674-2686.
- Öztürk S*, **Ergün B.G.***, Çalık P. 2017. Double promoter expression systems for recombinant protein production by industrial microorganisms. *Applied Microbiology and Biotechnology*. 101(20), pp.7459-7475
*Equal contribution.



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- **Ergün B.G.**, Çalık P. 2016. Lignocellulose degrading extremozymes produced by *Pichia pastoris*: Current state and future perspectives. *Bioprocess and Biosystems Engineering*. 39(1),pp.1-36

INVITED BOOK CHAPTERS

- **Ergün B.G.**, Çalık P. 2021. Hybrid-architected promoter design to deregulate expression in yeast. *In: Methods in Enzymology*. Academic Press. volume 660:105-125. doi: 10.1016/bs.mie.2021.05.014. Epub 2021 Jul 19. PMID: 34742384.
- **Ergün B.G.**, Çalık P. 2021. Hybrid architected promoter design to engineer expression in yeast. *In: Methods in Enzymology*. Academic Press. volume: 660:81-104. doi: 10.1016/bs.mie.2021.05.009. Epub 2021 Jul 27. PMID: 34742399.
- **Ergün B.G.**, Hücetogullari D., Öztürk S., Çelik E., Çalık P., 2019. Established and upcoming yeast expression systems. *In: Recombinant Protein Production in Yeast*. Ed: Gasser B, Mattanovich D, Humana Press Inc., ISBN: 978-1-4939-9023-8.

CONFERENCE PRESENTATIONS

- Ölmez F., Akan K., Maraş Vanlıoğlu F., Uslu T., **Ergün B. G.**, 2017. Yr15 Screening of Turkish Bread Wheat Varieties Using KASP Markers for Warrior, A New Race of Stripe Rust Pathogen (*Puccinia striiformis*) on Wheat in Turkey. Plant Health: Challenges Solutions, (Publication No:6169901) (Poster)
- **Ergün B.G.**, 16-21 April 2016. Potential applications of transglutaminase enzyme in cereal products. 15th International Cereal and Bread Congress, İstanbul, (Poster)
- **Ergün B.G.**, Çalık P., 3-6 April 2016. Extracellular microbial pro-transglutaminase production by recombinant *Pichia pastoris*. Pichia 2016 Conference, Antalya, Turkey, Abstract Book, P 63 (Poster)
- **Gündüz B.**, Çalık P., 23-26 September 2012. “Recombinant transglutaminase production by metabolically engineered *Pichia pastoris*”, 15th European Biotechnology Congress, İstanbul, Turkey, Abstract Book, P S80 (Poster)
- **Gündüz B.**, Çalık P., 15-19 February 2012. Transglutaminase Production Using Modified *Pichia pastoris* with Metabolic Engineering, International Food, Agriculture and Gastronomy Congress, Antalya, Turkey, Abstract Book, P 245-246 (Oral presentation)



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INVITED TALKS AND SEMINARS

- "Controlling transcription in non-conventional yeast *Komagataella phaffii*: Promoter engineering to enhance/deregulate expression", Gebze Technical University, Department of Bioengineering Webinar Series #28, 21 May 2021. (Invited webinar)

link: <https://www.gtu.edu.tr/icerik/3707/12261/display.aspx>

DISSERTATIONS

Doctorate, Transcriptional engineering of *Pichia pastoris* alcohol dehydrogenase 2 and alcohol oxidase 1 promoters for recombinant protein production, METU, Graduate School of Natural and Applied Sciences, Department of Biotechnology, 2018

Advisor: Prof Dr Pınar Çalık, Co-advisor: Prof Dr Diethard Mattanovich

Master of Science, Species composition changes in the ovine intestinal microbiome resulting from invasive microbial infection and treatment, The University of Edinburgh, School of Biological Sciences, Department of Biotechnology, 2014

Advisor: Dr Andrew Free, Co-advisor: Dr Craig Watkins

Master of Science, Recombinant transglutaminase production by metabolically engineered *Pichia pastoris* cells, METU, Graduate School of Natural and Applied Sciences, Department of Biotechnology, 2012

Advisor: Prof Dr Pınar Çalık, Co-advisor: Assoc Prof Dr Remziye Yılmaz

EDITORIAL BOARD APPOINTMENTS FOR SCIENTIFIC JOURNALS

2020- present: Biotech Studies, Manager Editor



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AWARDS DISTINCTIONS AND FELLOWSHIPS

- The Scientific and Technological Research Council of Turkey (TUBITAK) National Postdoctoral Research Fellowship Program, 2022-2024.
- The Scientific and Technological Research Council of Turkey (TUBITAK) International Research Fellowship for PhD Students, 2017-2018.
- TUBITAK National PhD Scholarship, 2014-2016
- Turkish Higher Education System Scholarship for MSc in the UK
- METU Graduate Courses Performance Award (PhD), 2012-2013
- TUBITAK National MSc Scholarship, 2010-2012
- METU Graduate Courses Performance Award (MSc), 2010-2011

RESEARCH INTERESTS

Industrial biotechnology, recombinant protein production, *Pichia pastoris*, strain design, de-novo genetic circuit design, synthetic biology, promoter engineering, transcriptional engineering, synthetic control of gene expression, CRISPR/Cas9, bioprocess design and optimization, pharmaceutical proteins, industrial enzymes