

Δρ Χρυσάνθη Πατεράκη

Επίκουρος Καθηγήτρια

Γνωστικό αντικείμενο: Μικροβιολογία με έμφαση στη Βιοτεχνολογία

Τμήμα Βιοχημείας και Βιοτεχνολογίας

Πανεπιστήμιο Θεσσαλίας

**Ερευνητικά ενδιαφέροντα**

Η ερευνητική μου δραστηριότητα επικεντρώνεται στην ανάπτυξη βιοδιεργασιών με τη χρήση ανανεώσιμων πρώτων υλών για την παραγωγή βιογενών προϊόντων μέσω ζυμώσεων με τη χρήση βακτηρίων, ζυμών ή/ και μυκήτων. Στόχος είναι η αξιοποίηση των παραπροϊόντων βιομηχανίας ή του οργανικού κλάσματος αστικών αποβλήτων για την παραγωγή βιο-χημικών ή βιο-πολυμερών. Η έρευνα μου επικεντρώνεται στην βελτιστοποίηση της παραγωγής βιογενών προϊόντων μέσω της μελέτης του μεταβολισμού των μικροοργανισμών με τη χρήση κλασικών βιοχημικών μεθόδων και μοριακών τεχνικών (μεταγραφομική). Επίσης η έρευνα μου επικεντρώνεται στην χρησιμοποίηση ηλεκτροχημικών κελιών σε συνδυασμό με τη ζύμωση και η επίδραση του ηλεκτρικού ρεύματος τόσο στον μεταβολισμό, όσο και στην βελτιστοποίηση της όλης διεργασίας για τον καθαρισμό των βιογενών προϊόντων. Η τεχνολογία αυτή έχει χρησιμοποιηθεί στην παραγωγή ηλεκτρικού οξέος μέσω βακτηριακής ζύμωσης και τον ταυτόχρονο διαχωρισμό και καθαρισμό με τη χρήση ηλεκτροχημικού κελιού με ανιοντικές μεμβράνες, επιτυγχάνοντας την αύξηση της απόδοσης και της παραγωγικότητας της ζύμωσης και την μείωση των σταδίων του διαχωρισμού.

Τα ερευνητικά μου αντικείμενα εντάσσονται στις ακόλουθες κατηγορίες:

- Τεχνολογία ζυμώσεων και «λευκή» βιοτεχνολογία.
- Ανάπτυξη αιεφόρων βιοδιυλιστηρίων για την παραγωγή βιο-χημικών ουσιών, βιο-αποικοδομήσιμων πολυμερών.
- Βιοχημική μηχανική και μηχανική βιοδιεργασιών.
- Βιομοριακή μηχανική (Μελέτη του μεταβολισμού των μικροοργανισμών, γενετική τροποποίηση)
- Χρήση ηλεκτροχημικών κελιών για την βελτιστοποίηση της βιοδιεργασίας.

Εκπαίδευση

- 2018** Διδακτορικό δίπλωμα, Τμήμα Επιστήμης Τροφίμων και Διατροφής Ανθρώπου, Γεωπονικό Πανεπιστήμιο Αθηνών
- 2012** Μεταπτυχιακό δίπλωμα στην Αμπελουργία – Οινολογία, Τμήμα Επιστήμης και Τεχνολογίας Τροφίμων και Τμήμα Επιστήμης Φυτικής Παραγωγής, Γεωπονικό Πανεπιστήμιο Αθηνών
- 2010** Πτυχίο Βιολογίας, Σχολή Θετικών Επιστημών, Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης
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Επαγγελματική απασχόληση

- Μάιο 2023-Σήμερα** **Επίκουρος Καθηγήτρια** στο Πανεπιστήμιο Θεσσαλίας, Τμήμα Βιοχημείας και Βιοτεχνολογίας, Γνωστικό αντικείμενο: Μικροβιολογία με έμφαση στη Βιοτεχνολογία
- Μαρ 2018- Μάιο 2023** **Μεταδιδακτορική έρευνα** στο Γεωπονικό Πανεπιστήμιο Αθηνών σε χρηματοδοτούμενα ερευνητικά προγράμματα
- Οκτ 2012-Μαρ 2018** Έρευνα ως υποψήφια διδάκτορας στο Γεωπονικό Πανεπιστήμιο Αθηνών σε χρηματοδοτούμενα ερευνητικά προγράμματα
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Ερευνητικό έργο**Δημοσιεύσεις σε επιστημονικά περιοδικά με κριτές**

1. Techno-economic and environmental sustainability assessment of succinic acid production from municipal biowaste using an electrochemical membrane bioreactor, Sofia Maria Ioannidou, Eleni Stylianou, Chrysanthi Pateraki, Ioannis Kookos, Korneel Rabaey, Apostolis Koutinas, Dimitrios Ladakis, *Chemical Engineering Journal*, 473, 145070, 2023
2. Pretreatment of Grape Pomaces and Stalks Using Deep Eutectic Solvents for Succinic Acid Production Integrated in a Biorefinery Concept, Katiana Filippi, Eleni Stylianou, **Chrysanthi Pateraki**, Apostolis Koutinas, Dimitrios Ladakis, *Waste and Biomass Valorization*, 14, 2857–2872, 2023
3. Development of an electrochemical membrane bioreactor for succinic acid production and in situ separation with engineered *Yarrowia lipolytica* cultivated on municipal biowaste hydrolysate, Eleni Stylianou, José M. Carvajal-Arroyo, Dimitrios Ladakis, Carol Sze Ki Lin, Vera Eßmann, Sebastian Dörr, Jakob Marbach, Korneel Rabaey, Apostolis Koutinas, **Chrysanthi Pateraki** (*corresponding author*), *Chemical Engineering Journal*, 466, 142877, 2023
4. Spent coffee grounds and orange peel residues based biorefinery for microbial oil and biodiesel conversion estimation, Nikos Giannakis, Miguel Carmona-Cabello, Aikaterini Makri, David Leiva-Candia, Katiana Filippi, **Chrysanthi Pateraki**, M.P. Dorado, Apostolis Koutinas, Eleni Stylianou, *Renewable Energy*, 209, 382-392, 2023
5. Transcriptional regulation in key metabolic pathways of *Actinobacillus succinogenes* in the presence of electricity, **Chrysanthi Pateraki** (*corresponding author*) Elena Magdalinou, Dimitrios Skliros, Emmanouil Flemetakis, Korneel Rabaey, Apostolis Koutinas, *Bioelectrochemistry*, 151, 108376, 2023
6. Circular PHB production via *Paraburkholderia sacchari* cultures using degradation monomers from PHB-based post-consumer bioplastics as carbon sources, Lina Zoghbi, Dimitrios Skliros, Emmanouil Flemetakis, Apostolis Koutinas, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Ladakis, *Biochemical Engineering Journal*, 191, 108808, 2023
7. Fermentative bioconversion of food waste into biopolymer poly(3-hydroxybutyrate-co-3-hydroxyvalerate) using *Cupriavidus necator*, Zubeen J. Hathi, Md Ariful Haque, Anshu Priya, Zi-hao Qin, Shuquan Huang, Chun Ho Lam, Dimitrios Ladakis, **Chrysanthi Pateraki**, Srinivas Mettu, Apostolis Koutinas, Chenyu Du, Carol Sze Ki Lin, *Environmental research*, 215, 114323, 2022, <https://doi.org/10.1016/j.envres.2022.114323>
8. Valorisation of wheat milling by-products into bacterial nanocellulose via ex-situ modification following circular economy principles, Aikaterini Natsia, Erminta Tsouko, Maria-Nefeli Eythimiou, Aristeidis Papagiannopoulos, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Selianitis, Stergios Pispas, Kostas Bethanis, Apostolis Koutinas, *Sustainable chemistry and pharmacy*, 29, 100832, 2022, <https://doi.org/10.1016/j.scp.2022.100832>

9. Property evaluation of bacterial cellulose nanostructures produced from confectionery wastes, Maria-Nefeli Efthymiou, Erminta Tsouko, **Chrysanthi Pateraki** (*corresponding author*), Aristeidis Papagiannopoulos, Pavlos Tzamalīs, Stergios Pispas, Kostas Bethanis, Ioanna Mantala, Apostolis Koutinas, *Biochemical Engineering Journal*, 186, 108575, 2022. <https://doi.org/10.1016/j.bej.2022.108575>
10. Biorefinery development, techno-economic evaluation and environmental impact analysis for the conversion of the organic fraction of municipal solid waste into succinic acid and value-added fractions, Dimitrios Ladakis, Eleni Stylianou, Sofia-Maria Ioannidou, Apostolis Koutinas, **Chrysanthi Pateraki** (*corresponding author*), *Bioresource Technology*, 354, 127172, 2022. <https://doi.org/10.1016/j.biortech.2022.127172>
11. Valorization of the organic fraction of municipal solid waste for fumaric acid production and electrochemical membrane extraction using *Candida blankii*, Chrysanthi Tatsi, **Chrysanthi Pateraki** (*corresponding author*), Korneel Rabaey, Apostolis Koutinas, *Bioresource Technology reports*, 17, 100900, 2022, <https://doi.org/10.1016/j.biteb.2021.100900>
12. Chemical profiling, bioactivity evaluation and the discovery of a novel biopigment produced by *Penicillium purpurogenum* CBS 113139, Antonis D. Tsailanis, **Chrysanthi Pateraki** (*corresponding author*), Mary Kyriazou, Christos Chatzigiannis, Maria Chatziathanasiadou, Nikolaos Parisi, Ioanna Mandala, Andreas G. Tzakos, Apostolis Koutinas, *Molecules*, 27, 69, 2022, <https://doi.org/10.3390/molecules27010069>
13. Bioconversions of biodiesel-derived glycerol into sugar alcohols by newly isolated wild-type *Yarrowia lipolytica* strains, Eleni-Stavroula Vastaroucha, Sofia Maina, Savvoula Michou, Ourania Kalantzi, **Chrysanthi Pateraki**, Apostolis A. Koutinas and Seraphim Papanikolaou, *Reactions*, 2, 499–513, 2021. <https://doi.org/10.3390/reactions204003>
14. Restructuring the sunflower-based biodiesel industry into a circular bio-economy business model converting sunflower meal and crude glycerol into succinic acid and value-added co-products, Maria-Nefeli Efthymiou, **Chrysanthi Pateraki** (*corresponding author*), Harris Papapostolou, Carol Sze Ki Lin, Apostolis Koutinas, *Biomass and Bioenergy*, 155, 106265, 2021, <https://doi.org/10.1016/j.biombioe.2021.106265>
15. Integrated biorefinery development using winery waste streams for the production of bacterial cellulose, succinic acid and value-added fractions, Katiana Filippi, Harris Papapostolou, Maria Alexandri, Anestis Vlysidis, Eleni Myrtsi, Dimitrios Ladakis, **Chrysanthi Pateraki**, Serkos A. Haroutounian, Apostolis Koutinas, *Bioresource Technology*, *Bioresource Technology*, 125989, 2022, <https://doi.org/10.1016/j.biortech.2021.125989>
16. Optimization of fermentation medium for succinic acid production using *Basfia succiniciproducens*, Eleni Stylianou, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Ladakis, Anestis Vlysidis,

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17. Bioprocess development using organic biowaste and sustainability assessment of succinic acid production with engineered *Yarrowia lipolytica* strain, Eleni Stylianou, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Ladakis, Christina Damala, Anestis Vlysidis, Marcos Latorre-Sánchez, Caterina Coll, Carol Sze Ki Lin, Apostolis Koutinas, *Biochemical Engineering Journal*, 174, 108099, 2021. <https://doi.org/10.1016/j.bej.2021.108099>
 18. Bioprocess Development for 2,3-Butanediol Production by *Paenibacillus* Strains, Daniel Tinoco, **Chrysanthi Pateraki**, Apostolis A. Koutinas, Denise M. G. Freire, *ChemBioEng Reviews*, 8, 44-62, 2021. doi:10.1002/cben.202000022
 19. Fed-batch bioprocess development for astaxanthin production by *Xanthophyllomyces dendrorhous* based on the utilization of *Prosopis* sp. pods extract, Miguel Ángel Villegas-Méndez, Aikaterini Papadaki, **Chrysanthi Pateraki**, Nagamani Balagurusamy, Julio Montañez, Apostolis A. Koutinas, Lourdes Morales-Oyervides, *Biochemical Engineering Journal*, 166, 107844, 2021, doi.org/10.1016/j.bej.2020.107844
 20. Succinic acid production from pulp and paper industry waste: A transcriptomic approach, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Skliros, Emmanouil Fletmetakis, Apostolis Koutinas, *Journal of Biotechnology*, 325: 250-260, 2021, doi.org/10.1016/j.jbiotec.2020.10.015
 21. Sustainable production of bio-based chemicals and polymers via integrated biomass refining and bioprocessing in a circular bioeconomy context, Sofia Maria Ioannidou, **Chrysanthi Pateraki**, Dimitrios Ladakis, Harris Papapostolou, Maria Tsakona, Anestis Vlysidis, Ioannis K. Kookos, Apostolis Koutinas, *Bioresource Technology*, 307, 2020, [/doi.org/10.1016/j.biortech.2020.123093](https://doi.org/10.1016/j.biortech.2020.123093)
 22. Evaluation of organic fractions of municipal solid waste as renewable feedstock for succinic acid production, Eleni Stylianou, **Chrysanthi Pateraki** (*corresponding author*), Dimitrios Ladakis, María Cruz-Fernández, Marcos Latorre-Sánchez, Caterina Coll, Apostolis Koutinas. *Biotechnology for Biofuels*, 13, 72, 2020. doi.org/10.1186/s13068-020-01708-w
 23. Indigenous yeasts: emerging trends and challenges in winemaking, Iliada K Lappa, Vasiliki Kachrimanidou, **Chrysanthi Pateraki**, Dionysios Koulougliotis, Effimia Eriotou, Nikolaos Kopsahelis, *Current Opinion in Food Science*, 32: 133-143, 2020, doi.org/10.1016/j.cofs.2020.04.004
 24. Direct electrochemical extraction increases microbial succinic acid production from spent sulphite liquor, **Chrysanthi Pateraki**, Stephen J Andersen, Dimitrios Ladakis, Apostolis Koutinas, Korneel Rabaey, *Green Chemistry*, 21, 2401-2411, 2019, [Green Chemistry, doi.org/10.1039/C9GC00361D](https://doi.org/10.1039/C9GC00361D)
 25. Valorisation of fruit and vegetable waste from open markets for the production of 2,3-butanediol, Vasiliki Liakou, **Chrysanthi Pateraki** (*corresponding author*), Anastasia-Marina Palaiogeorgou, Nikolaos Kopsahelis, Aline Machado de Castro, Denise Maria Guimarães Freire, George-John E.

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26. Microbial oil production from various carbon sources by newly isolated oleaginous yeasts, Sofia Maina, **Chrysanthi Pateraki** (*corresponding author*), Nikolaos Kopsahelis, Spiros Paramithiotis, Eleftherios H. Drosinos, Seraphim Papanikolaou, Apostolis Koutinas, Engineering in Life Sciences, 00, 1–12, 2016, doi:10.1002/elsc.201500153
27. Succinic acid production by *Actinobacillus succinogenes* from batch fermentation of mixed sugars, Henrik Almqvist, **Chrysanthi Pateraki**, Maria Alexandri, Apostolis Koutinas, Gunnar Lidén,. Journal of Industrial Microbiology & Biotechnology 43 (2016) 1117-1130. doi:10.1007/s10295-016-1787-x
28. Pretreatment of spent sulphite liquor via ultrafiltration and nano-filtration for bio-based succinic acid production, **Chrysanthi Pateraki**, Dimitris Ladakis, Lutgart Stragier, Willy Verstraete, Ioannis Kookos, Seraphim Papanikolaou, Apostolis Koutinas, Journal of Biotechnology, 233, 95-105, 2016, doi:10.1016/j.jbiotec.2016.06.027
29. Modeling succinic acid fermentation using a xylose based substrate, **Chrysanthi Pateraki**, Henrik Almqvist, Dimitris Ladakis, Gunnar Liden, Apostolis A Koutinas, Anestis Vlysidis, Biochemical Engineering Journal, 113, 26-41, 2016, doi:10.1016/j.bej.2016.06.011
30. *Actinobacillus succinogenes*: Advances on succinic acid production and prospects for development of integrated biorefineries, **Chrysanthi Pateraki**, Maria Patsalou, Anestis Vlysidis, Nikolaos Kopsahelis, Colin Webb, Apostolis A. Koutinas, Michalis Koutinas. Biochemical Engineering Journal 112 (2016) 285-303. doi:10.1016/j.bej.2016.04.005
31. Effect of sulfur dioxide addition in wild yeast population dynamics and polyphenolic composition during spontaneous red wine fermentation from *Vitis vinifera* cultivar Agiorgitiko., **Chrysanthi Pateraki**, Spiros Paramithiotis, Agapi I. Doulgeraki, Stamatina Kallithraka, Yorgos Kotseridis, Eleftherios H. Drosinos, European Food Research and Technology 239 (2014) 1067–1075. doi:10.1007/s00217-014-2303-z
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Κεφάλαια σε βιβλία

1. Lactic Acid Bacteria as Cell Factories: Synthetic Biology and Metabolic Engineering, Chapter 7: Lactic acid bacterial cell factories for the production of gamma-aminobutyric acid, Spiros Paramithiotis, **Chrysanthi Pateraki**, <https://www.sciencedirect.com/science/article/abs/pii/B9780323919302000171>
2. Lactic Acid Bacteria as Cell Factories: Synthetic Biology and Metabolic Engineering, Chapter 6: Lactic acid bacteria for riboflavin production, Spiros Paramithiotis, **Chrysanthi Pateraki**, <https://www.sciencedirect.com/science/article/abs/pii/B9780323919302000171>

3. The Handbook of Polyhydroxyalkanoates, Postsynthetic Treatment, Processing and Application, Chapter 8: Competitive Advantage and Market Introduction of PHA Polymers and Potential Use of PHA Monomers, Konstantina Kourmentza, Vasiliki Kachrimanidou, Olga Psaki, **Chrysanthi Pateraki**, Dimitrios Ladakis, Apostolos Koutinas, <https://www.taylorfrancis.com/books/e/9781003087663/chapters/10.1201/9781003087663-11>
 4. Comprehensive Biotechnology (Third Edition), Volume 2: Engineering Perspectives in Biotechnology, Chapter 2.59: Biorefinery Engineering, **Chrysanthi Pateraki**, Aikaterini Papadaki, Vasiliki Kachrimanidou, Apostolis Koutinas, Elsevier, 2019
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Επιλεγμένες προφορικές παρουσιάσεις και αναρτημένες ανακοινώσεις σε επιστημονικά συνέδρια

1. Lina Zoghbi, Dimitris Ladakis, Chrysanthi Pateraki, Apostolis Koutinas, Poly(3-hydroxybutyrate) production using degradation products from chemical and enzymatic recycling of post-consumer bioplastics, 11th World Congress of Chemical Engineering, 4-8 June 2023, (Oral presentation by Chrysanthi Pateraki)
2. Chrysanthi Pateraki, Eleni Stylianou, Dimitrios Ladakis, Apostolis Koutinas, Brewer's spent grain valorisation via biorefinery development and poly(3-hydroxybutyrate) production via fermentation. 18th International Conference on Renewable Resources and Biorefineries (RRB18), Bruges, Belgium, 1-3 June 2022, (Poster presentation by Eleni Stylianou)
3. Chrysanthi Pateraki, Eleni Stylianou, Korneel Rabaey, Apostolis Koutinas, Valorization of the Organic Fraction of Municipal Solid Waste: Improving Process Efficiency Via Biomass Refining and in Situ Electrochemical Separation of Bio Based Products, 2019 AIChE Annual Meeting, Orlando, Florida, USA, 10-15 November 2019, (Oral presentation by Chrysanthi Pateraki)
4. Pateraki Chrysanthi, Derveni Eleni, Gkatzogia Melissanthi, Rabaey Korneel, Koutinas Apostolos, Bioprocess development using municipal solid waste for the production of crude enzymes and fumaric acid in electrochemical bioreactor, The 12th EUROPEAN CONGRESS OF CHEMICAL ENGINEERING, Florence, Italy, 15-19 September 2019, (Oral presentation by Chrysanthi Pateraki)
5. Maria Papadopoulou, Chrysanthi Pateraki, Apostolis Koutinas, Exploitation of Open Market Wastes Through Biorefinery Development and Production of Natural Pigments by *Penicillium Purpurogenum*, 8th International forum on industrial bioprocessing (IBA-IFIBIOP), Hybrid conference, 1-5 May 2019, (Oral presentation by Chrysanthi Pateraki)
6. Chrysanthi Pateraki, Eleni Stylianou, Apostolis Koutinas, Bioprocess development using the biowaste fraction of municipal solid waste for the production of crude enzymes and succinic acid, XIII Seminario Brasileiro de de Tecnologia Enzimatica (ENZITEC), Floripa, Brazil 16-19 September 2018, (Invited oral presentation)

7. Chrysanthi Pateraki, Stephen Andersen, Apostolis Koutinas, Korneel Rabaey. Enhanced succinic acid production by *Basfia succiniciproducens* through integrated fermentation with electrolytic membrane extraction. 10th World Congress of Chemical Engineering, Barcelona, Spain, 1-5 October 2017, (Oral presentation by Chrysanthi Pateraki)
8. Chrysanthi Pateraki, Maria Alexandri, Dimitris Ladakis, Harris Papapostolou, Anestis Vlysidis, Apostolis Koutinas, Pretreatment of pulp and paper industry by-product stream for the production of lignosulphonates and succinic acid, 247th American chemical society national meeting and exposition, Dallas, Texas, USA, 16-20 March 2014, (Oral presentation by Chrysanthi Pateraki)
9. Chrysanthi Pateraki, Maria Alexandri, Harris Papapostolou, Anestis Vlysidis, Seraphim Papanikolaou, Apostolis Koutinas, Valorization of by-product streams from the pulp and paper industry for succinic acid production. TechConnect World – CleanTech Conference and Showcase, Washington, USA, 12-16 May 2013, (Oral presentation by Chrysanthi Pateraki)

Ερευνητικές επισκέψεις σε πανεπιστήμια και ερευνητικά κέντρα

- 1 Εκπαίδευση στην γενετική τροποποίηση βακτηρίων και μυκήτων στο 26 Μαΐου – 23
εργαστήριο του Professor Long Liu στο School of Biotechnology, Jiangnan Ιουνίου 2019
University (Wuxi, China).
- 2 Ερευνητική εργασία στα πλαίσια του προγράμματος *Production of hydrolase 2013 – 2018*
enzymes and bifunctional monomers (1,3-PDO, 2,3-BDO and fumaric acid) in (2 μήνες το
order to produce petrochemicals (project funded by Petrobras, Brazil) της χρόνο)
Professor Denise Maria Guimarães Freire στο Instituto de Quimica στο
Universidade Federal do Rio de Janeiro (Brazil) και στην Petrobras
- 3 Ερευνητική εργασία στα πλαίσια του προγράμματος “New tailor-made 23 – 25
biopolymers produced from lignocellulosic sugars waste for highly demanding Νοεμβρίου
fire-resistant applications -BRIGIT” στην εταιρεία AVECOM (Ghent, Belgium) 2014
- 4 Εκπαίδευση στην παραγωγή ηλεκτρικού οξέος και ερευνητική εργασία στο 30 Νοεμβρίου
εργαστήριο του Gunnar Liden στο Department of Chemical Engineering, LUND 2013 – 02
University (Lund, Sweden). Μαρτίου 2014