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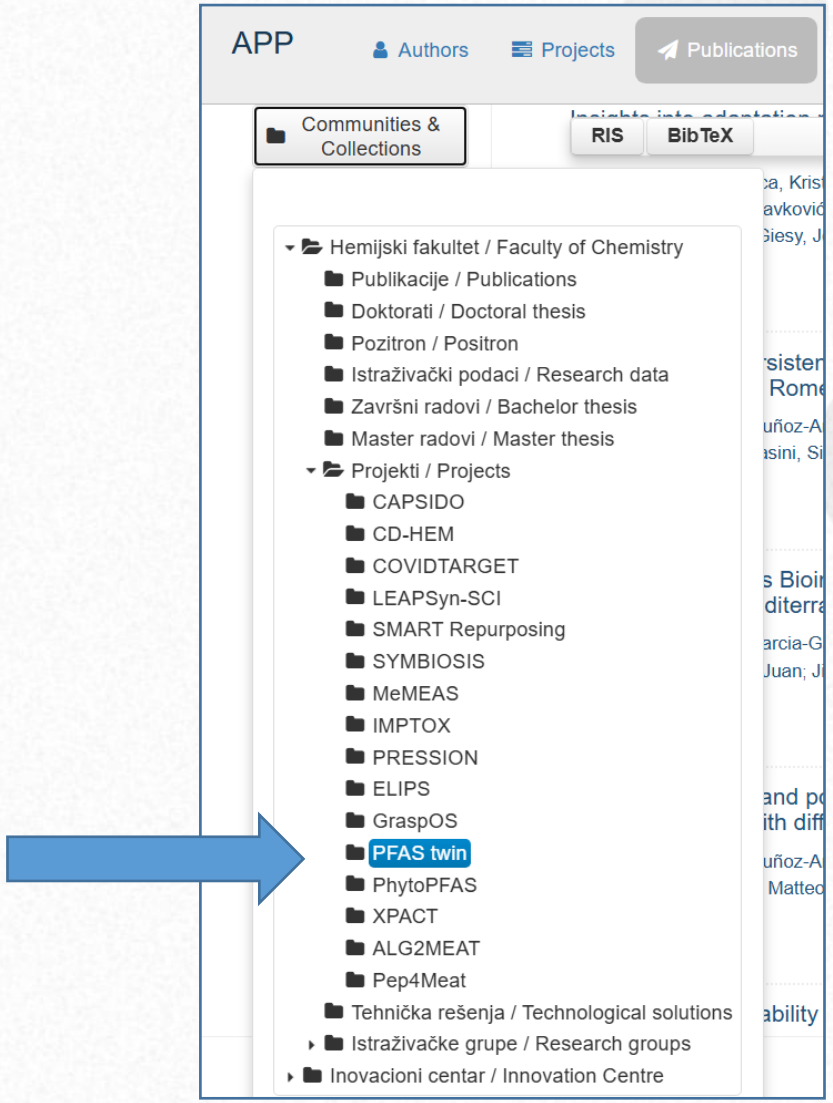

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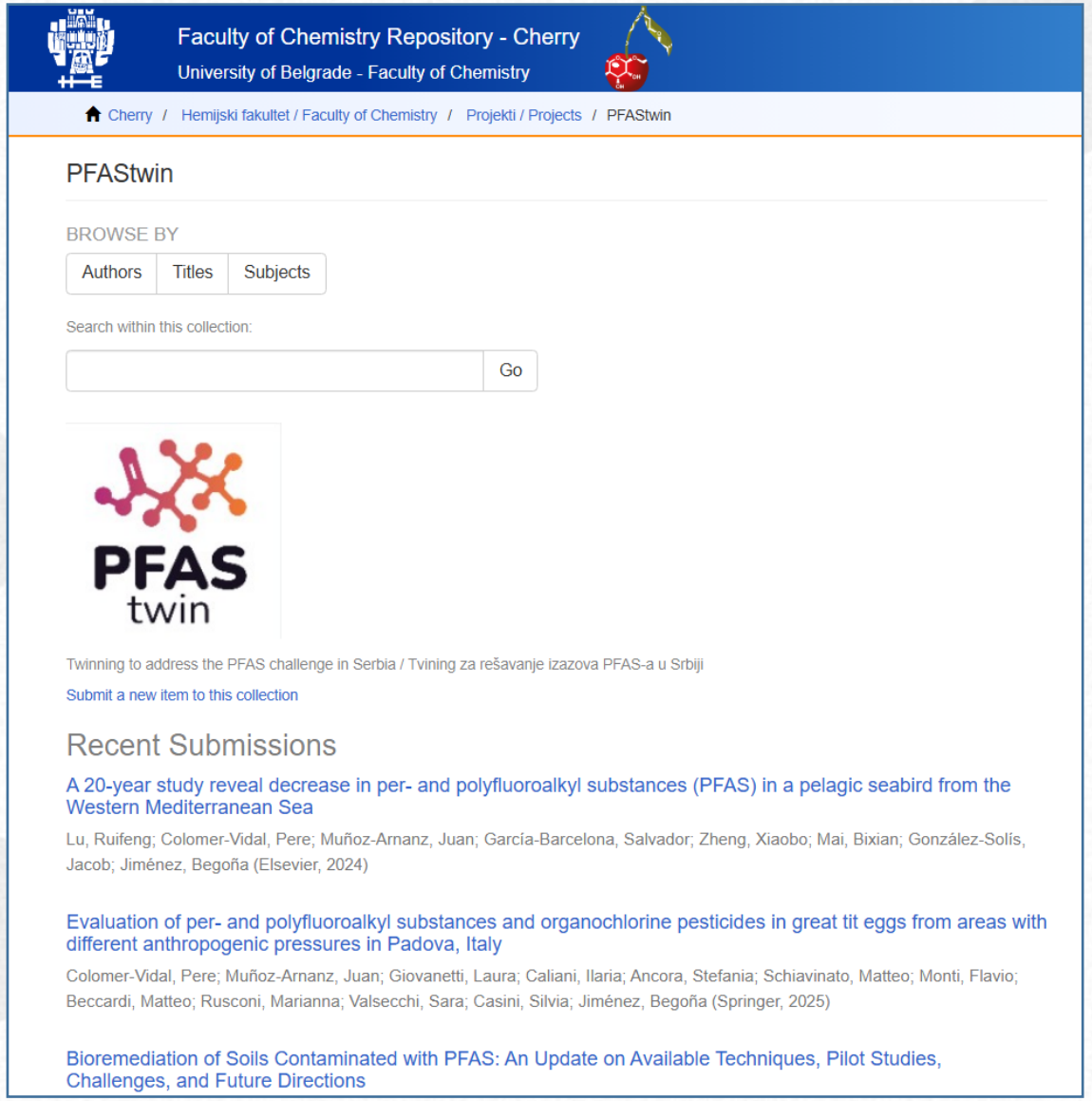

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Lu, Ruifeng; Colomer-Vidal, Pere; Muñoz-Arnanz, Juan; García-Barcelona, Salvador; Zheng, Xiaobo; Mai, Bixian; González-Solís, Jacob; Jiménez, Begoña (Elsevier, 2024)

Evaluation of per- and polyfluoroalkyl substances and organochlorine pesticides in great tit eggs from areas with different anthropogenic pressures in Padova, Italy

Colomer-Vidal, Pere; Muñoz-Arnanz, Juan; Giovanetti, Laura; Caliani, Ilaria; Ancora, Stefania; Schiavinato, Matteo; Monti, Flavio; Beccardi, Matteo; Rusconi, Marianna; Valsecchi, Sara; Casini, Silvia; Jiménez, Begoña (Springer, 2025)

Bioremediation of Soils Contaminated with PFAS: An Update on Available Techniques, Pilot Studies, Challenges, and Future Directions

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Final Paper

Bioremediation of Soils Contaminated with PFAS: An Update on Available Techniques, Pilot Studies, Challenges, and Future Directions

Authorized Users Only

Per- and polyfluoroalkyl substances (PFAS) have emerged as a significantclass of pollutants due to their broad environmental and health implications. PFAShave been used in a range of industrial and consumer applications since the 1940s,leading to their widespread presence in the environment, including among others,water sources, soil, and even the human body. As a result, these man-madechemicals have gained substantial attention in recent years due to their persistence,bioaccumulative nature, and adverse effects on both ecosystems and human health.Increasing scientific and regulatory attention is being paid to the occurrence and fateof PFAS in drinking water, wastewater, and the environment in general. Particularly,PFAS-contaminated soil has become increasingly reported in many parts of theworld, and is now being recognized as a serious environmental hazard. Whenthese chemicals are present in soil, they can infiltrate the groundwater, potentiallyleading to drinking water and food conta...

2024

Keywords:
Microbial remediation / PFAS / Phytoremediation / Soil

Source:
Soil Remediation Science and Technology. The Handbook of Environmental Chemistry, 2024, 130, 331-366

Authors
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Inui, Hideyuki
Nakano, Takeshi

Publisher:
- Springer, Cham.

Funding / projects:
- PFAStwin - Twinning to address the PFAS challenge in Serbia (EU-HE-101059534)

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Bioremediation of Soils Contaminated with PFAS: An Update on Available Techniques, Pilot Studies, Challenges, and Future Directions

Per- and polyfluoroalkyl substances (PFAS) have emerged as a significantclass of pollutants due to their broad environmental and health implications. PFAShave been used in a range of industrial and consumer applications since the 1940s,leading to their widespread presence in the environment, including among others,water sources, soil, and even the human body. As a result, these man-madechemicals have gained substantial attention in recent years due to their persistence,bioaccumulative nature, and adverse effects on both ecosystems and human health.Increasing scientific and regulatory attention is being paid to the occurrence and fateof PFAS in drinking water, wastewater, and the environment in general. Particularly,PFAS-contaminated soil has become increasingly reported in many parts of theworld, and is now being recognized as a serious environmental hazard. Whenthese chemicals are present in soil, they can infiltrate the groundwater, potentiallyleading to drinking water and food conta...

2024

Keywords:
Microbial remediation / PFAS / Phytoremediation / soil

Source:
Soil Remediation Science and Technology. The Handbook of Environmental Chemistry, 2024, 130, 331-366

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Inui, Hideyuki
Nakano, Takeshi

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Insights into adaptation mechanisms and survival strategies of Pseudomonas chlororaphis subsp. aurantiaca: A comparative proteomic study under PFOA exposure

2026

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Authors

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Karadžić, Ivanka
Inui, Hideyuki
Giesy, John
Beškoski, Vladimir

Article (Published version)

Perfluorooctanoic acid (PFOA), increasingly detected at extreme concentrations in industrial hotspots, caused a reduction in growth and a prolonged lag phase in Pseudomonas chlororaphis subsp. aurantiaca. In order to reveal microbial adaptation mechanisms and survival strategies under exposure to PFOA, a comparative proteomic analysis was undertaken. The up-regulation of phosphoglycerol transferase, lipoproteins, and long-chain fatty acid synthesis, together with the down regulation of cis unsaturation of fatty acids and changes in specific membrane-embedded porins, indicate alterations in membrane structure, fluidity, and permeability. The up-regulation of the divalent cation–regulated outer membrane protein H1, accompanied by the down-regulation of zinc and other metal transporters, reflect changes in metal ion homeostasis. In particular, altered iron homeostasis and expression of iron-, Fe-S clusters-, and heme-containing proteins were detected, along with the reduced activity of so...

Keywords:
PFOA / Proteome / Enzymes / Survival strategies / Iron homeostasis

Source:
Ecotoxicology and Environmental Safety, 2026, 311, 119859-

Funding / projects:
- PFAStwin - Twinning to address the PFAS challenge in Serbia (EU-HE-101059534)

DOI: 10.1016/j.ecoenv.2026.119859

WoS: 001695491600001

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...

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Two Main Sub-Tasks:

(i) Publishing open-access papers in high-impact scientific journals and

(ii) presenting research results at national and international conferences.

Planned vs. Achieved

-At least **3** peer-reviewed scientific papers...

- **5** peer-reviewed papers
- **1** book chapter

(+ **1** paper published shortly after the project ended)

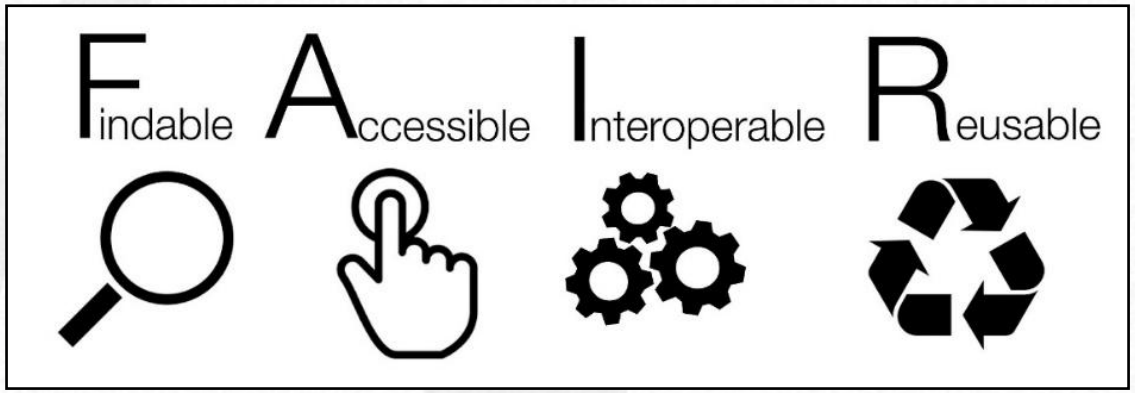
Name of publication	Journal /Book	Year
Long-term bioelectricity generation in microbial fuel cell exposed to perfluorooctanoic acid	Bioresource Technology	2026
Insights into adaptation mechanisms and survival strategies of *Pseudomonas chlororaphis subsp.* aurantiaca: A comparative proteomic study under PFOA exposure	Ecotoxicology and Environmental Safety	2026
Photocatalytic degradation of PFOA over rGO-doped TiO_2 coatings formed by plasma electrolytic oxidation	Journal of Environmental Chemical Engineering	2025
Evaluation of per- and polyfluoroalkyl substances and organochlorine pesticides in great tit eggs from areas with different anthropogenic pressures in Padova, Italy	Environmental Science and Pollution Research	2025
A 20-year study reveal decrease in per- and polyfluoroalkyl substances (PFAS) in a pelagic seabird from the Western Mediterranean Sea	Environmental Pollution	2024
Bioremediation of Soils Contaminated with PFAS: An Update on Available Techniques, Pilot Studies, Challenges, and Future Directions	Soil Remediation Science and Technology. The Handbook of Environmental Chemistry	2024
Per- i polifluoroalkil supstance (PFAS) - izvori zagađenja, izazovi remedijacije i potencijalni abiotički tretmani zagađenih voda.	Voda i sanitarna tehnika	2024

Planned vs. Achieved

- At least **5** conference participation per year...

- total of **35** presentations delivered at national and international conferences.

Conference name	Place	No. of papers	Participant	Year
18th International Conference on Chemistry and the Environment (ICCE 2023)	Venice, Italy	2	UBFC, IQOG-CSIC	2023
18th Symposium on Chemistry and Environmental Protection (Envirochem23)	Kladovo, Serbia	2	UBFC	2023
European Meeting on Environmental Chemistry (EMEC23)	Budva, Montenegro	3	UBFC	2023
XXII Meeting of the Spanish Society of Chromatography and Related Techniques (SECYTA 2023)	Mallorca, Spain	1	IQOG-CSIC	2023
SETAC (Society of Environmental Toxicology and Chemistry Europe) 34th Annual Meeting	Seville, Spain	5	UBFC, IQOG-CSIC	2024
XXIII Meeting of the Spanish Society of Chromatography and Related Techniques (SECYTA 2024)	Pamplona, Spain	1	IQOG-CSIC	2024
4th International Conference on Microbial Ecotoxicology (EcotoxicoMic)	Gothenburg, Sweden	1	BRGM	2024
European Meeting on Environmental Chemistry (EMEC24)	Alicante, Spain	1	UBFC	2024
XXII European Conference on Analytical Chemistry (Euroanalysis 2025)	Barcelona, Spain	1	IQOG-CSIC	2025
19th International Conference on Chemistry and the Environment (ICCE 2025)	Belgrade, Serbia	6	UBFC, BRGM IQOG-CSIC,	2025
EGU General Assembly 2025	Vienna, Austria	1	BRGM	2025
International Conference on Environmental and Sustainable Research Solutions	Novi Sad, Serbia	2	UBFC	2025
4th International and 16th National Congress of the Serbian Society of Soil Science	Vrdnik, Serbia	1	UBFC	2025
IUPAC World Chemistry Congress 2025 & IUPAC General Assembly 2025,	Kuala Lumpur, Malaysia,	1	UBFC	2025
European Symposium on Fluorine Chemistry (ESFC)	Lisbon, Portugal	2	UBFC	2025
FEBS3+ Meeting – Advances in Molecular Biosciences: From Genes to Personalized Therapies	Belgrade, Serbia	1	UBFC	2025
European Meeting on Environmental Chemistry (EMEC25)	Chania, Crete	2	UBFC	2025
Conference of Young Chemists of Serbia	Kragujevac, Serbia	2	UBFC	2025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