



Amy McMackin

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ABOUT ME

As a Food Science doctoral student, I'm passionate about ensuring well-being and nutrition through sustainable food processing technologies. I'm equally passionate about inspiring change through public policy, science communication, and education.

I hold a Swiss B Permit (Family Reunification) with full, unconditional Swiss labor market access. No visa sponsorship or domestic priority labor checks required. I will be eligible for a C permit or citizenship in April 2028.

WORK EXPERIENCE

🏢 **ETH Zürich** – Zürich, Switzerland

Doctoral candidate, Food Science

[01/11/2023 – Current]

Besides tasks relating to my academic project (see Education and training), my responsibilities include:

- Maintaining analytical equipment
- Overseeing chemistry laboratories (2)
- Serving as the group's chemical safety officer
- Supervising student thesis projects (9) and scientific assistants (6)
- Teaching practical (3) and theoretical courses (3)

🏢 **InitiaSciences** – Montreal, remote, Canada

Communications manager

[01/09/2021 – 01/01/2024]

As part of my work with this start-up non-profit organization, my responsibilities included:

- Managing social media accounts (4) and the website
- Writing funding applications (6)

🏢 **Collège de Béthusy, Canton de Vaud** – Lausanne, Switzerland

Teacher

[01/05/2023 – 31/10/2023]

My work as an English and French teacher continued from experience at Maplehurst Middle School in Moncton, New Brunswick, Canada, from September 2022 to April 2023.

🏢 **Institut des Sciences de la Mer de Rimouski/ Université du Québec à Rimouski** – Rimouski, Canada

Research assistant, Analytical chemistry & Science writing

[01/05/2018 – 30/04/2022]

As a student research assistant in analytical chemistry for oceanography, my responsibilities included:

- Preparing and participating in fieldwork (James Bay, Canada)
- Analyzing water samples, fish tissues, and bivalve hemolymph
- Determining the commercial fishery and environmental impacts of hydrocarbon spills in marine ecosystems
- Writing, proofreading, translating (French to English), and editing scientific manuscripts (6)

EDUCATION AND TRAINING

Doctorate of Food Science

ETH Zürich [01/11/2023 – Current]

City: Zürich | **Country:** Switzerland | **Website:** <https://ethz.ch/en.html> | **Level in EQF:** EQF level 8 | **Thesis:** Green Refining of Protein Sources Using Natural Deep Eutectic Solvents: Opportunities for Novel Protein Ingredients from Rapeseed and Pea

- Map extraction kinetics of polyphenols and proteins from rapeseed and pea using natural deep eutectic solvents (NADES), compared to conventional solvents (i.e., water, ethanol)
- Produce and characterize high purity (79-97%) rapeseed and pea protein isolates at commercial yields (>60%)
- Recover and characterize used solvent and polyphenols
- Supervise bachelor (5) and master (4) thesis projects; teach practical (3) and theoretical (3) courses
- Communicate results at national (4) and international conferences (6), and in academic texts (3 published, 1 submitted)

This project is funded by Future Food - A Swiss Research Initiative, with support from Nestlé, Bühler, and Givaudan.

Master of Science

Université du Québec à Rimouski [01/09/2020 – 20/12/2022]

City: Rimouski | **Country:** Canada | **Website:** <https://www.uqar.ca/> | **Field(s) of study:** Chemistry | **Final grade:** A+ | **Level in EQF:** EQF level 7 | **Number of credits:** 45 | **Thesis:** Towards a New Strategy for Valorizing Brewer's Spent Grain: a study of Spent Grain Solubilization for the Production for More Sustainable Personal Hygiene Products

- Develop a green method to pretreat and dissolve brewer's spent grain
- Develop a green method to shape and solidify brewer's spent grain-derived microbeads
- Characterize microbeads to ensure compliance with industry standards (i.e., SEM-EDS, FTIR, nanoindentation, biodegradability and phytotoxicity studies, cleansing efficiency and stability studies)
- Process scale-up
- Communication of results at national (4) and international (3) conferences, in the media (2), and in academic texts (2)

This research project involved a 13-month internship at the Quebec Agrifood Innovation Center (Centre de développement bioalimentaire du Québec) in La Pocatière, Quebec, Canada.

Bachelor of Science

Université du Québec à Rimouski [01/09/2017 – 18/06/2020]

City: Rimouski | **Country:** Canada | **Website:** <https://www.uqar.ca/> | **Field(s) of study:** Environmental and bioresource chemistry | **Final grade:** B+ | **Level in EQF:** EQF level 6 | **Number of credits:** 90

LANGUAGE SKILLS

Mother tongue(s): English

Other language(s):

French

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

German

LISTENING B2 **READING** B2 **WRITING** B1

SPOKEN PRODUCTION B1 **SPOKEN INTERACTION** B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

CONFERENCES AND SEMINARS

[25/10/2026 – 29/10/2026] Hong Kong, SAR China

IUFoST World Food Congress Presentation of the partial results of my doctoral research project (talks) titled **From Off-Flavour to Function: NADES-Based Engineering of Protein-Polyphenol Interactions in Pea Protein Isolates** and **NADES-Based Refining of Rapeseed Proteins: Controlling Polyphenol-Protein Interactions for Improved Flavour and Functionality**. Participation (talk) in the Swiss Academy of Sciences (SCNAT) special session on

sustainable food processing strategies titled **Green Refining of Protein Sources Using Natural Deep Eutectic Solvents: Opportunities for Novel Protein Ingredients.**

[13/10/2026 – 16/10/2026] Papendal, The Netherlands

NIZO Plant Protein Functionality Conference Presentation of the partial results of my doctoral research project (talk) titled **NADES-Based Refining of Rapeseed and Pea Proteins: Modulating Polyphenol-Protein Interactions for Improved Flavour and Functionality.**

[04/05/2026 – 06/05/2026] New Orleans, United States of America

AOCS Annual Conference and Meeting Presentation of the partial results of my doctoral research project (talk) titled **Natural Deep Eutectic Solvents in Food Processing: Improving Plant Proteins by Decoupling Phytochemical Interference.** This presentation won third place in the Protein & Co-Products Graduate Student competition.

[13/10/2025 – 16/10/2025] Rome, Italy

World Food Forum, FAO I was the chosen delegate to represent ETH Zürich at the Europe and Central Asia roundtable of this event.

[07/04/2025 – 09/04/2025] Dubrovnik, Croatia

Green Nutri Food Presentation of the partial results of my doctoral research project (talk) titled **From Bitter to Better: Towards Enhanced Plant Proteins using Natural Deep Eutectic Solvents.**

[24/07/2022 – 29/07/2022] Castelldefels, Spain

Gordon Research Conference, Green Chemistry Presentation of the results of my master's research project (poster & talk) titled **Production and Characterization of Biodegradable Lignocellulosic Microbeads from Brewer's Spent Grain.**

PUBLICATIONS

Tailoring Protein–Polyphenol Interactions to Enhance Functionality in High-Purity Yellow Pea (*Pisum sativum* L.) Protein Isolates

McMackin, A., Zimmermann, D., Dumpler, J., Mathys, A. (2026) Submitted.

From bitter to better: optimizing polyphenol extraction from yellow pea (*Pisum sativum* L.) using natural deep eutectic solvents (NADES) for improved plant protein products

McMackin, A., Müller, G., Dumpler, J., Mathys, A. (2026) Sustainable Food Technol., Vol. 4 (3): 2536–2548

Recovering Spent Natural Deep Eutectic Solvents Using Organic Solvent Nanofiltration

Dumpler, J., McMackin, A., Zimmermann, D., Mathys, A. (2026) ACS Sustainable Resour. Manage., Vol. 3 (5): 1434-1444

Rapeseed Refined: Extraction of Polyphenols, Glucosinolates, Phytate, and Protein from Whole Dehulled Rapeseed Using Natural Deep Eutectic Solvents

Dumpler, J.,* McMackin, A.,* Herren, M., Hashemi Zadeh, S., Mathys, A. (2025) ACS Sustainable Chem. Eng., Vol. 13 (41): 17275–17286

Carbohydrate-based alternatives to traditional synthetic plastic microbeads: a critical review

McMackin, A., Cardinal, S. (2025) RSC Sustain., Vol. 3 (4): 1629-1651

Biosourced spherical microbeads from brewer's spent grain for sustainable personal hygiene products This primary research article based on my MSc research project is featured on the cover of this edition of the Journal of Polymer Science.

McMackin, A., Banville, V., Cardinal, S. (2024) J. Polym. Sci., Vol. 62 (11), 2270-2287