CV date	26/09/2023

Part A. PERSONAL INFORMATION

First name	M. Carmen		
Family name	Güell Saperas		
Gender (*)		Birth date (dd/mm/yyyy)	
ID number (NIE)			
e-mail	carme.guell@urv.cat	https://www.deq.urv.cat/ca/personal/carme-guell/	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-4566-5132	

(*) Mandatory

A.1. Current position

Position	Associate Professor (Profesora Titular de Universidad)			
Initial date	10/11/2000			
Institution	Universitat Rovira i Virgili			
Department/Center	DEQ	Escuela Técnica Superior de Ingeniería Química		
Country	Spain		Teleph. number	+34 977 558504
Key words	Membrane technology, encapsulation, membrane emulsification, membrane fouling, microfiltration, insect proteins			

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
22-01-1991-08-07-1994	Profesora Titular Interina de Escuela Universitaria/Facultad de Enología de Tarragona/Universitat Rovira i Virgili/Promotion
09-07-1994-10-11-2000	Profesora Titular de Escuela Universitaria/Facultad de Enología de Tarragona/Universitat Rovira i Virgili/Promotion

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licenciatura Ciencias Químicas, esp. Química industrial	Universidad de Barcelona/Spain	1986
Doctorado en CC QQ	Universidad de Barcelona/Spain	1991

(Include all the necessary rows)

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

After finishing my Ph D thesis about mass transfer coefficients during microbial coal desulphurization, I started a one-year post-doctoral stay (1991-1992) at the Department of Viticulture and Enology, University of California, Davis (USA) to study the relationship between nutrient deficient musts and stuck fermentations supervised by Prof. Roger Boulton. In 1992 I returned to URV holding a position as Assistant Professor at the *Facultat d'Enologia*. The main research of my group at URV was focused on improving membrane processes for the wine industry, therefore I re-oriented my expertise by joining Prof. R. Davis group at the University of Colorado, Boulder, for more than one year (1994-1995 and July-September 1996). My research during this stay focused on membrane fouling characterization during microfiltration of biological streams. Specifically, I studied the role of protein fouling during microfiltration, that is highly relevant for membrane filtration in food related processed. My most highly cited paper comes from this research *(Güell & Davis, Membrane fouling during microfiltration of protein mixtures, Journal of Membrane Science, 1996, 119, 269-284*). Related to this topic, more specifically in the use of infrasound to prevent membrane fouling, I obtained funding as PI for a project in the framework of the *Plan Nacional* and I supervised my first Ph D thesis. This research was followed by studies on the recovery of osmotic dehydration solutions from the food industry, that resulted in a Ph D thesis defended in 2005.

From 2003 on, membrane fouling research was extended with the use of confocal scanning laser microscopy (CLSM) to detect and locate possible foulants on the membrane surface and inside the

membrane structure. The first results were published in 2003 (*Ferrando et al., An approach to membrane fouling characterization by confocal scanning laser microscopy, J. of Memb. Sci., 2005, 250, 283-293*) and a Ph D thesis was presented in 2009. Due to the potential of CSLM for on-line membrane characterization, my research group organized an international workshop in 2006 at URV on that topic. Because of the interest and relevance of the presentations, Wiley VCH decided to publish a book based on the contents of the presentations, from which I am co-editor and I co-authored one of the chapters. Also, related to characterization techniques for membrane process characterization I was the leading researcher of an international network funded by *Agència de Gestió d'Ajuts Universitaris i de Recerca* (AGAUR) from *Generalitat de Catalunya*, that was followed by a research project lead by Prof. Corinne Cabassud (INSA, Toulouse).

The Spanish *Plan Nacional* funded a project to apply CSLM to characterize membrane fouling during membrane emulsification processes in 2007. This project, together with the IMPULSE project (with European funds), was the start of our investigations on membrane emulsification for encapsulation of food-grade compounds, which has been my main research area until today. In the framework of this research, I have coordinated four research projects funded by "Plan Nacional" and have started collaboration with other research groups. Among them, I highlight the fruitful collaboration established since 2008 with Prof. Karin Schroën (Food Process Engineering Group, Wageningen University, The Netherlands). Through this collaboration three of our Ph D students have done research stays at WUR and I spend a 6-month sabbatical in 2011 (funded by the *Salvador de Madariaga* Programme). During my sabbatical in Prof. Schroën's group I joined a project for on-line production of layer-by-layer stabilized emulsions using a microfluidic device.

Since 2018 my research in emulsion-based encapsulation systems has broadened to include valorization of food by-products, combining membrane technologies for concentration by forward osmosis and encapsulation using membrane emulsification. The research has been supported by a local company (*Unió Corporació Alimentària*) willing to recover food ingredients from by-products and a French manufacturing company of forward osmosis equipment, who granted the use of a pilot equipment to our group. Also, in the framework of a project from Plan Nacional my research group has started to study the use of edible insect proteins as replacers of dairy proteins for food applications. In December 2021 a Ph D thesis was defended on this topic.

During the last 5 years my research group and I have been very committed to bring our research to society and make its youngest members, especially females, aware of the advances in food engineering and to awake interest in engineering careers. From all my research activity I have published 73 papers and three book chapters, as well as more than 115 communications to national and international conferences. I have supervised 8 doctoral thesis (defended) and 3 ongoing. Metrics overview (Scopus, 26-09-2023): 72 documents by the author, 2037 citations, h-index: 28.

Part C. RELEVANT MERITS

C.1. Publications

Ballon, A., and Romero, M.P., Rodriguez-Saona, L., de Lamo-Castellvi, S., Güell, C., and Ferrando, M. Conjugation of Lesser mealworm (*Alphitobius diaperinus*) larvae protein with polyphenols for the development of innovative antioxidant emulsifiers (2024) **Food Chemistry**. In press

Jayakumar, J., Ballon, A., Pallarès, J., Vernet, A., de Lamo-Castellví, S., Güell, C., Ferrando, M. Lesser mealworm (*A. diaperinus*) protein as a replacement for dairy proteins in the production of O/W emulsions: Droplet coalescence studies using microfluidics under controlled conditions (2023) **Food Research International**, 172, art. no. 113100. Open Access.

Kaade, W., Méndez-Sánchez, C., **Güell, C.,** De Lamo-Castellví, S., Mestres, M., Ferrando, M. (2022) Complexed Biopolymer of Whey Protein and Carboxymethyl Cellulose to Enhance the Chemical Stability of Lemon Oil-in-Water Emulsions, **ACS Food Science and Technology**, 2 (1), pp. 41-48. DOI: 10.1021/acsfoodscitech.1c00274. Cited 5 times.

Wang, J., Jousse, M., Jayakumar, J., Fernández-Arteaga, A., de Lamo-Castellví, S., Ferrando, M., **Güell, C.** Black soldier fly (*Hermetia illucens*) protein concentrates as a sustainable source to stabilize o/w emulsions produced by a low-energy high-throughput emulsification technology (2021) **Foods**, 10 (5), 1048. DOI: 10.3390/foods10051048. Cited 15 times

Wang, J., Martínez-Hernández, A., de Lamo-Castellví, S., Romero, M.-P., Kaade, W., Ferrando, M., **Güell, C.** Low-energy membrane-based processes to concentrate and encapsulate polyphenols from carob pulp (2020) **Journal of Food Engineering**, 281, art. no. 109996. DOI: 10.1016/j.jfoodeng.2020.109996. Cited 23 times.

Kaade, W., **Güell, C.**, Ballon, A., Mellado-Carretero, J., De Lamo-Castellví, S., Ferrando, M. Dynamic membranes of tunable pore size for lemon oil encapsulation (2020) **LWT**, 123, 109090. DOI: 10.1016/j.lwt.2020.109090. Cited 11 times.

Kaade, W., Ferrando, M., Khanmohammed, A., Torras, C., De Lamo-Castellví, S., **Güell, C.** Low-energy high-throughput emulsification with nickel micro-sieves for essential oils encapsulation (2019) **Journal of Food Engineering**, 263, pp. 326-336. DOI: 10.1016/j.jfoodeng.2019.07.006. Cited 11 times.

Rudolph, G., Virtanen, T., Ferrando, M., **Güell, C.**, Lipnizki, F., Kallioinen, M. A review of in situ real-time monitoring techniques for membrane fouling in the biotechnology, biorefinery and food sectors (2019) **Journal of Membrane Science**, 588, art. no. 117221. DOI: 10.1016/j.memsci.2019.117221. Cited 71 times.

Estévez, M., **Güell, C.**, De Lamo-Castellví, S., Ferrando, M. Encapsulation of grape seed phenolic-rich extract within W/O/W emulsions stabilized with complexed biopolymers: Evaluation of their stability and release (2019) **Food Chemistry**, 272, pp. 478-487. DOI: 10.1016/j.foodchem.2018.07.217. Cited 21 times. Cited 43 times.

Güell, C., Ferrando, M., Trentin, A., Schroën, K. Apparent interfacial tension effects in protein stabilized emulsions prepared with microstructured systems (2017) **Membranes**, 7 (2), art. no. 19. DOI: 10.3390/membranes7020019. Cited 18 times.

Schroën, K., Ferrando, M., de Lamo-Castellví, S., Sahin, S., **Güell, C.** Linking findings in microfluidics to membrane emulsification process design: The importance of wettability and component interactions with interfaces (2016) **Membranes**, 6 (2), art. no. 26. DOI: 10.3390/membranes6020026. Cited 24 times.

Berendsen, R., **Güell, C**., Ferrando, M. Spray dried double emulsions containing procyanidin-rich extracts produced by premix membrane emulsification: Effect of interfacial composition (2015) **Food Chemistry**, 178, pp. 251-258. DOI: 10.1016/j.foodchem.2015.01.093. Cited 42 times.

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

Invited Conference: M. Ferrando, S. de Lamo-Castellví, C. Güell, *Encapsulation strategies for food applications based on emulsions produced by micro-structured systems*, **31st EFFOST International Conference**, 13-16 November 2017, Sitges, Spain.

Oral Presentation: C. Güell, A. Martínez-Hernández, A. García, J. Wang, M. P. Romero, J. Ruíz, V. Alonso, M. Ferrando, *Combined membrane processes to valorise agri-food by-products: the carob case*, **Euromembrane 2018**, 9-13 July 2018, Valencia, Spain.

Oral Presentation: J. Wang, S. de Lamo-Castellví, A. Fernández-Arteaga, M. Ferrando, C. Güell, *Proteins from Black Soldier Fly (Hermetia illucens) as emulsifiers in oil-in-water emulsions produced by premix emulsification*, **Insecta 2019**, 5 September 2019, Potsdam, Germany.

Oral Presentation: García-Guitérrez, N., Mellado-Carretero, J., Salvador, A., Sanz, T., Ferrando, M., **Güell, C**., de Lamo-Castellví, S. Attenuated total reflected infrared spectroscopy combined with multivariate analysis. A novel tool for insect food product design, **Insecta 2019**, 5 September 2019, Potsdam, Germany.

Oral Presentation: Mellado-Carretero, J., García-Guitérrez, N., Ferrando, M., **Güell, C.**, de Lamo-Castellví, S. Rapid authentication of edible insect powders by means of infrared spectroscopy and multivariate analysis, **Insecta 2019**, 5 September 2019, Potsdam, Germany.

Key Note Presentation: W. Kaade, J. Wang, M. Ferrando, S. de Lamo-Castellví, C. Güell, *Benefits and limitations of microporous emulsification for aroma encapsulation with conventional and new emulsifiers*, **12th International Congress on Membranes and Membrane Processes, ICOM**, 7-11 December 2020, London, UK,

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

Innovation for Sustainability and Societal relevance: Partnerships in evidence-based higher education on food systems and climate change, EUROPEAN EDUCATION AND CULTURE EXECUTIVE AGENCY (EACEA) Grant Agreement **Project 101083056 — INSSPIRE** ERASMUS-EDU-2022-CBHE-STRAND-2 , **Leading Researcher (LR)**: Denyse Snelder, VU, 800.000,00€ from 2023-2025.

Microencapsulación con emulsiones mediante membranas dinámicas de porosidad controlada empleando ingredientes de uso alimentario procedentes de insectos, PGC2018-097095-B-I00, Proyectos de I+D de generación de Conocimiento, Ministerio de Ciencia, Innovación y Universidades **Leading Researchers (LRs):** Montserrat Ferrando **/ Carme Güell**, Universitat Rovira i Virgili, 96.800,00 € from 01/01/2019 to 30/06/2022.

Encapsulación de compuestos de uso alimentario mediante emulsificación por membranas dinámicas y/o de bajo coste, CTQ2014-54520-P, Programa Nacional de Ciencias y Tecnologías Químicas, Ministerio de Economía y Competitividad**, LRs: Carme Güell** / Montserrat Ferrando Universitat Rovira i Virgili, 182.710,00 € from 01/01/2014 to 31/12/2018.

Funcionalidad tecnológica de nuevos ingredientes alimentarios, **PEJ2018-004192-A,** Ministerio de Ciencia e Innovación, **LR: Carme Güell** 39.200,00 € to hire Mrs. Nerea Gutiérrez from 91/10/2019 to 30/09/2021. Mrs. Gutiérrez is currently working at Iberinsect, Reus, Tarragona.

Food Sensometry and Engineering, FoodSE, 2014 SGR 1263, Ajuts per donar suport a grups de recerca – SGR, Agencia de Gestió d'Ajuts d'Universitat i Recerca, Generalitat de Catalunya, **LR:** Olga Busto Busto. Universitat Rovira i Virgili, **C. Güell member of the research team**, 28.000,00 from 01/01/2014 to 31/12/2016.

Encapsulación de polifenoles y ácidos grasos omega-3 mediante emulsificación por membranas: diseño de producto y optimización de proceso, CTQ2011-22793, Programa Nacional de Ciencias y Tecnologías Químicas, Ministerio de Economía y Competitividad, **LR: Carme Güell**. Universitat Rovira i Virgili, 170.610,00 € from: 01/01/2012 to 31/12/2014.

Membrane-based systems for water reuse: influence of micropollutants on membrane fouling**,** 2010 CTP 00033, Comunitat de Treball dels Pirineus, Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR), **LR: Carme Güell**, Universitat Rovira i Virgili, 20.000,00 €, from 2009 to 2012.

C.4. Contracts, technological or transfer merits,

Contract: Title: Disseny de producte de complements alimentaris ecologics Company: Glower, S.L. Start date: 2021, Finish date: 2021. Budget: 5.600€. **LRs:** Sílvia de Lamo Castellví, **Carme Güell** and Montserrat Ferrando.

Contract: Title: Envelliment saludable i sostenible amb aliments rics en proteïnes d'insecte (ESSARPI). Company: Diputació de Tarragona. Start date: 2021, Finish date: 2021. Budget: 15.000€. LR: Maria Teresa Blay. **Member of the research team**.
Contract: Title: Funcionalidad tecnológica de nuevos ingredientes alimentarios. Company: Fundació URV. Start date: 2019, Finish date.: 2019. Budget: 3.500€. **LR**: Sílvia de Lamo Castellví. **Member of the research team**
Contract: Title: Desenvolpament d'un alcohol texturitzat-Etapa2. Company: Ricart, S.L. Start date: 2017, Finish date: 2018. Budget: 9.180 €. **LR:** Sílvia de Lamo Castellví and Olga Busto. **Member of the research team**.
Contract: Title: desenvolpament d'un alcohol texturitzat-Etapa1. Company: Ricart, S.L. Start date: 2016, Finish date: 2017. Budget: 5.880 €.: Sílvia de Lamo Castellví and Olga Busto. **Member of the research team**
Contract: Title: Aplicació de la tecnologia de membranes per concentrar solucions riques en sucres procedents d'extractes de garrofa. Company: - Unió Corporació Alimentària. Start date: 2014, Finish date: 2014. Budget: 20.000 €. **LRs:** Montserrat Ferrando, **Carme Güell.**