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LTH Profile Area: Food and Bio
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Research

I have worked in the field of physical chemical characterisation of proteins since 1987. First as a PhD and research assistant working with protein adsorption to solid surfaces and the influence of other surface active components on this. After this I worked with oral and parenteral delivery of pharmaceutical peptides, in the capacity as head of formulation at Ferring AB. Upon my return to the University I have broadened the scope of delivery problems that I work with I have been involved in research endeavours often together with industry partners dealing with controlled delivery of both biological and traditional drugs. When it comes to protein delivery the focus has been on depo-formulations and recently on protein/surfactant interactions. For the traditional drugs most of the focus has been in using hydrogels both classical ones and hydrophobically modified ones for controlled delivery of lipophilic substances. An important part of this work is to investigate the physicochemical properties of the gels, including rheological properties. I am also involved in projects related to Pickering emulsions and primarily their use in formulations for topical creams. I have had several collaborations with pharmaceutical companies especially through diploma workers but also in research collaborations. The companies include Ferring, AstraZeneca, McNeal, Bioglan, Bonesupport, Biogaia Zelmic technology, Nycomedpharma, Leopharma, and NovoNordisk.

Employment

Office director, Professor

Division of Food and Pharma
Lund University
Lund, Sweden
2015 Sept 21 → present

Deputy head of department

Department of Process and Life Science Engineering
Lund University
Lund, Sweden
2024 Jan 3 → present

Profile area member

LTH Profile Area: Engineering Health
Lund University
Sweden
2024 Jun 17 → present

Profile area member

LTH Profile Area: Food and Bio
Lund University
Sweden
2024 Sept 16 → present

Riksdagsledamot

Swedish Parliament
Stockholm, Sweden
2002 Jan 1 → 2006 Jan 1

Head Pharmaceutical department

Ferring AB
Copenhagen, Denmark
1997 Oct 1 → 2000 Jul 30

Ferring AB, Malmö Group manager Peroral group

Ferring AB
Copenhagen, Denmark
1997 Apr 1 → 1997 Dec 30

Research output

How are we handling protein drugs in hospitals? A human factors and systems engineering approach to compare two hospitals and suggest a best practice

Sabaté-Martínez, C., Paulsson, M., González-Suárez, S., Elofsson, U., Fureby, A. M., Wahlgren, M. & López-Cabezas, C., 2024 Jan 1, In: *International Journal for Quality in Health Care*. 36, 1, mzae020.

The use of starch microspheres and nanoparticles in pharmaceutical applications

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Impact of Post Manufacturing Handling of Protein-Based Biologic Drugs on Product Quality and User Centricity

Cappelletto, E., Kwok, S. C., Sorret, L., Fuentes, N., Medina, A., Burleigh, S., Fast, J., Mackenzie, I. S., Fureby, A. M., Paulsson, M., Wahlgren, M., Elofsson, U., Flynn, A., Miolo, G., Nyström, L., De Laureto, P. P. & De Paoli, G., 2024, In: *Journal of Pharmaceutical Sciences*. 113, 8, p. 2055-2064

Modulating protein unfolding and refolding via the synergistic association of an anionic and a nonionic surfactant

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The Impact of Annealing Methods on the Encapsulating Structure and Storage-Stability of Freeze-Dried Pellets of Probiotic Bacteria

Palmkron, S. B., Bergenståhl, B., Hall, S., Håkansson, S., Wahlgren, M., Larsson, E. & Fureby, A. M., 2024, In: *Pharmaceutical Research*. 41, p. 1671-1682 12 p.

Examination of the Protein Drug Supply Chain in a Swedish University Hospital: Focus on Handling Risks and Mitigation Measures

Martínez, C. S., Amery, L., De Paoli, G., Elofsson, U., Fureby, A. M., Kwok, S., López-Cabezas, C., Rosenberger, M., Schoenau, C., Wahlgren, M. & Paulsson, M., 2023 Nov, In: *Journal of Pharmaceutical Sciences*. 112, 11, p. 2799-2810 12 p.

Realizing the AF4-UV-SAXS on-line coupling on protein and antibodies using high flux synchrotron radiation at the CoSAXS beamline, MAX IV

Bolinsson, H., Söderberg, C., Herranz-Trillo, F., Wahlgren, M. & Nilsson, L., 2023 Oct, In: *Analytical and Bioanalytical Chemistry*. 415, 25, p. 6237-6246 10 p.

Quantification of structures in freeze-dried materials using X-ray microtomography

Bai Palmkron, S., Bergenståhl, B., Håkansson, S., Wahlgren, M., Fureby, A. M. & Larsson, E., 2023 Feb 5, In: *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 658, 130726.

Utilising phase diagram to understand barley starch microsphere preparation in an aqueous two-phase system

Gidlöf, Z., Lomstein Pedersen, B., Nilsson, L., Teleman, A., Wahlgren, M. & Millqvist-Fureby, A., 2023 Feb 5, In: Colloids and Surfaces A: Physicochemical and Engineering Aspects. 658, 130652.

Charge and zeta-potential distribution in starch modified with octenyl succinic anhydride (OSA) determined using electrical asymmetrical flow field-flow fractionation (EAF4)

Fuentes, C., Choi, J., Wahlgren, M. & Nilsson, L., 2023 Jan, In: Colloids and Surfaces A: Physicochemical and Engineering Aspects. 657, 130570.

Investigating thermally induced aggregation of Somatropin- new insights using orthogonal techniques

Västberg, A., Bolinsson, H., Leeman, M., Nilsson, L., Nylander, T., Sejwal, K., Sintorn, I. M., Lidayová, K., Sjögren, H., Wahlgren, M. & Elofsson, U., 2023, In: International Journal of Pharmaceutics. 637, 122829.

Deep eutectic solvents for the preservation of concentrated proteins: the case of lysozyme in 1 : 2 choline chloride : glycerol

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Ali, A., Skedung, L., Burleigh, S., Lavant, E., Ringstad, L., Anderson, C., Wahlgren, M. & Engblom, J., 2022 Feb 5, In: International Journal of Pharmaceutics. 613, 12 p., 121370.

Shear-induced nanostructural changes in micelles formed by sugar-based surfactants with varied anomeric configuration

Larsson, J., Williams, A. P., Wahlgren, M., Porcar, L., Ulvenlund, S., Nylander, T., Tabor, R. F. & Sanchez-Fernandez, A., 2022 Jan 15, In: Journal of Colloid and Interface Science. 606, p. 328-336 9 p.

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Temperature and Heat Transfer Control During Freeze Drying. Effect of Vial Holders and Influence of Pressure

Palmkron, S. B., Gustavsson, L., Wahlgren, M., Bergenståhl, B. & Fureby, A. M., 2022, In: Pharmaceutical Research. 39, 10, p. 2597-2606

Topological Dynamics of Micelles Formed by Geometrically Varied Surfactants

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Mucoadhesion: mucin-polymer molecular interactions

Pham, Q. D., Nöjd, S., Edman, M., Lindell, K., Topgaard, D. & Wahlgren, M., 2021 Dec 15, In: International Journal of Pharmaceutics. 610, 9 p., 121245.

The impact of glycerol on an affibody conformation and its correlation to chemical degradation

Ramm, I., Sanchez-Fernandez, A., Choi, J., Lang, C., Fransson, J., Schagerlöf, H., Wahlgren, M. & Nilsson, L., 2021 Nov, In: Pharmaceutics. 13, 11, 14 p., 1853.

Tail unsaturation tailors the thermodynamics and rheology of a self-assembled sugar-based surfactant

Larsson, J., Leung, A. E., Lang, C., Wu, B., Wahlgren, M., Nylander, T., Ulvenlund, S. & Sanchez-Fernandez, A., 2021 Mar, In: Journal of Colloid and Interface Science. 585, p. 178-183 6 p.

Molecular structure of maltoside surfactants controls micelle formation and rheological behavior

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Capturing progression of formal knowledge and employability skills by monitoring case discussions in class

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Effects of starch granules differing in size and morphology from different botanical sources and their mixtures on the characteristics of Pickering emulsions

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In vitro methods to study colon release: State of the art and an outlook on new strategies for better in-vitro biorelevant release media

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The effect of the anomeric configuration on the micellization of hexadecylmaltoside surfactants

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Pickering emulsions based on CaCl₂-gelatinized oat starch

Saari, H., Johansson, D. B., Knopp, N., Sjö, M., Rayner, M. & Wahlgren, M., 2018, In: Food Hydrocolloids. 82, p. 288-295 8 p.

Sifting segregation of ideal blends in a two-hopper tester: Segregation profiles and segregation magnitudes
Marucci, M., Al-Saaigh, B., Boissier, C., Wahlgren, M. & Wikström, H., 2018, In: Powder Technology. 331, p. 60-67 8 p.

Will a water gradient in oral mucosa affect transbuccal drug absorption?
Ali, A., Wahlgren, M., Pedersen, L. & Engblom, J., 2018, In: Journal of Drug Delivery Science and Technology. 48, p. 338-345 8 p.

Production of starch nanoparticles by dissolution and non-solvent precipitation for use in food-grade Pickering emulsions
Saari, H., Fuentes, C., Sjöö, M., Rayner, M. & Wahlgren, M., 2017 Feb 10, In: Carbohydrate Polymers. 157, p. 558-566 9 p.

Comparative Emulsifying Properties of Octenyl Succinic Anhydride (OSA)-Modified Starch: Granular Form vs Dissolved State
Matos González, M., Marefati, A., Gutiérrez, G., Wahlgren, M. & Rayner, M., 2016 Aug 1, In: PLoS ONE. 11, 8, p. e0160140 0160140.

Preparation and Characterization of Starch Particles for Use in Pickering Emulsions
Saari, H., Heravifar, K., Rayner, M., Wahlgren, M. & Sjöö, M., 2016, In: Cereal Chemistry. 93, 2, p. 116-124

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Particle-stabilized emulsions
Sjöö, M., Rayner, M. & Wahlgren, M., 2015 Jan 1, *Engineering Aspects of Food Emulsification and Homogenization*. Rayner, M. & Dejmek, P. (eds.). CRC Press, p. 101-122 22 p.

Amperometric In Vitro Monitoring of Penetration through Skin Membrane
Gari, H., Rembiesa, J., Masilionis, I., Vreva, N., Svensson, B., Sund, T., Hansson, H., Moren, A. K., Sjöö, M., Wahlgren, M., Engblom, J. & Ruzgas, T., 2015, In: Electroanalysis. 27, 1, p. 111-117

Barrier properties of heat treated starch Pickering emulsions.
Sjöö, M., Emek, S. C., Hall, T., Rayner, M. & Wahlgren, M., 2015, In: Journal of Colloid and Interface Science. 450, p. 182-188

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Söderberg, L., Engblom, J., Lanbeck, P. & Wahlgren, M., 2015, In: International Journal of Pharmaceutics. 484, 1-2, p. 246-251

Release of a Poorly Soluble Drug from Hydrophobically Modified Poly (Acrylic Acid) in Simulated Intestinal Fluids.
Knöös, P., Svensson, A. V., Ulvenlund, S. & Wahlgren, M., 2015, In: PLoS ONE. 10, 10, e0140709.

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Effects of Added Surfactant on Swelling and Molecular Transport in Drug-Loaded Tablets Based on Hydrophobically Modified Poly(acrylic acid)
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The use of micro- and nanoparticles in the stabilisation of pickering-type emulsions for topical delivery.

Wahlgren, M., Engblom, J., Sjö, M. & Rayner, M., 2014, In: Current Pharmaceutical Biotechnology. 14, 15, p. 1222-1234

Monitoring and stimulating development of integrated professional skills in university study programmes

Wahlgren, M. & Ahlberg, A., 2013, In: European Journal of Higher Education. 3, 1, p. 62-73 12 p.

Using NMR Chemical Shift Imaging To Monitor Swelling and Molecular Transport in Drug-Loaded Tablets of Hydrophobically Modified Poly(acrylic acid): Methodology and Effects of Polymer (In)solubility

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Using observed student team problem solving to monitor and stimulate development of complex integrated professional skills

Ahlberg, A. & Wahlgren, M., 2012 Oct 22, p. 53-54.

Characterization of starch Pickering emulsions for potential applications in topical formulations.

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Comparison of in vitro methods of measuring mucoadhesion: Ellipsometry, tensile strength and rheological measurements.

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Assessing progression in engineering study programs

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Development of mass transport resistance in poly(lactide-co-glycolide) films and particles - A mechanistic study.

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Curriculum building and student progression in two LTH engineering study programmes

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Detergent Induced Removal of b-Lactoglobulin from Stainless Steel Surfaces at Influenced by Surface Pretreatment

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The use of mutant proteins in protein adsorption studies

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Activities

FORMULATION TECHNOLOGY IN PHARMACEUTICS, NUTRACEUTICS AND COSMETICS

Wahlgren, M. (Participant)

2016 Oct 10

Powder Technology in Pharma, Food and Chemistry

Wahlgren, M. (Contributor)

2013 → 2020

Awards

Hållbar och kontinuerlig tillverkning av biotekniska läkemedelsprodukter

Wahlgren, M. (PI)

Swedish Government Agency for Innovation Systems (Vinnova): SEK680,000.00

2024/08/01 → 2025/07/31