




UniBa



CONVEGNO NAZIONALE
(CHIMICA)
 EDIZIONE 2023
sotto l'albero



INNOVAZIONE E RESILIENZA: GIOVANI
 RICERCATORI PER UN FUTURO SOSTENIBILE
 18 - 19 DICEMBRE, BARI - AULA MAGNA DBBA

APPLICATION FORM FOR SUBMITTING AN ABSTRACT

To be sent by November 30th, 2023

www.sites.google.com/view/chimicasottolalbero

<i>Pecora Desirèe</i>		
<i>University of Milan</i>		
<i>Via L. Mangiagalli, 25</i>		<i>20133 – Milan – Italy</i>
<i>Telephone</i>	<i>PhD student</i>	<i>desiree.pecora@unimi.it</i>

Preference: Presenting author Participant as audience

For abstract contributors, please fill the following:

Preference: Oral presentation Flash presentation Poster presentation

Title Development of flow processes for the sustainable synthesis of new sugar-based surfactants
Authors
Company(es) or Organization(s) University of Milan, 20133, Milan Italy

Development of flow processes for the sustainable synthesis of new sugar-based surfactants

Desirèe Pecora^a, *Giulia Brioschi*^b, *Beatrice Mapelli*^a, *Sara Sangiorgio*^c, *Riccardo Semproli*^d,
Marina Simona Robescu^d, *Daniela Ubiali*^d, *Giovanna Speranza*^c, and *Lucia Tamborini*^a

^aDipartimento di Scienze Farmaceutiche, Università degli Studi di Milano, 20133, Milano, Italy;

^bDipartimento di Scienze per gli Alimenti, la Nutrizione e l'Ambiente, 20133, Milano, Italy;

^cDipartimento di Chimica, Università degli Studi di Milano, 20133, Milano, Italy;

^dDipartimento di Scienze del Farmaco, Università degli Studi di Pavia, 27100, Pavia, Italy.

Surfactants are amphiphilic organic compounds widely used in the pharmaceutical, food, and personal care industries thanks to their physicochemical properties and functional properties. However, traditional chemical synthesis of sugar-based surfactants typically requires harsh reaction conditions (hazardous solvents, high temperature, the use of reducing agents) resulting in high energy consumption, formation of undesirable by-products, and low regioselectivity.¹

In this context, we designed and synthesized a series of bio-based surfactants by exploiting enabling technologies as flow chemistry and (chemo)enzymatic catalysis trying to increase the sustainability and the scalability of the whole process. We focused on the production of glucose-based amines through a continuous reductive amination reaction, exploiting amines that can be obtained from the corresponding natural fatty acids (Figure 1).² These key intermediates were used as starting compounds for the synthesis of a sugar-fatty acid amide analogue of the commercially available *GlucoPure*[®], and a series of glucamides as new non-ionic potential surfactants (Figure 2).

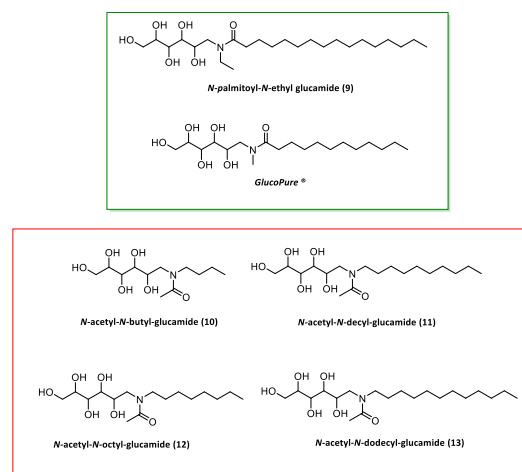
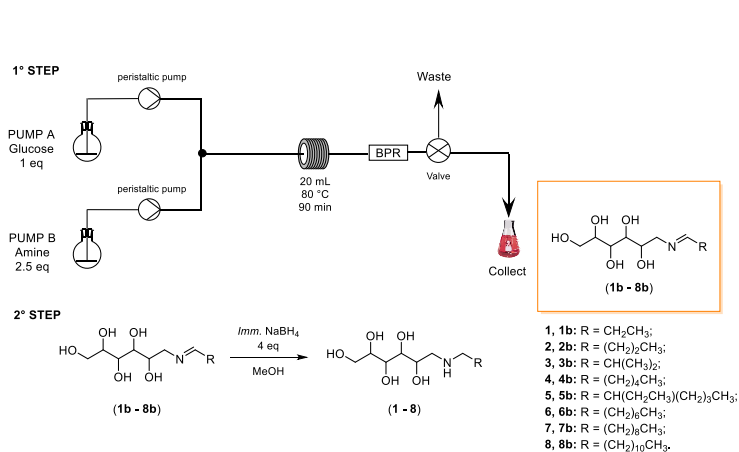


Figure 1: Flow synthesis of glucose-based amines.

Figure 2: Structure of surfactants 9-13.

Acknowledgements: Fondazione Cariplo

Keywords: Bio-surfactants, flow chemistry

References

- Holmberg K, *Natural Surfactants*, Current Opinion in Colloid & Interface Science (2001), pag. 148–159 [10.1016/S1359-0294\(01\)00074-7](https://doi.org/10.1016/S1359-0294(01)00074-7).
- Citoler J, Derrington S R, Galman J L, Bevinakatti, H, Turner N J, *Green Chemistry*, Correction: A Biocatalytic Cascade for the Conversion of Fatty Acids to Fatty Amines (2019), pag. 6222–6222 [10.1039/c9gc90096a](https://doi.org/10.1039/c9gc90096a).