UNIVERSITÀ DEGLI STUDI DI MILANO

TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO **COD ID: 6110**

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B post-doc fellowship Supervisor: Maurizio Benaglia

[Francesca Franco]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Franco
Name	Francesca
Date of birth	08/03/1992

PRESENT OCCUPATION

Appointment	Structure
PostDoc	Università degli Studi di Milano

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Laurea Magistrale	Chemistry	Università degli studi di Salerno	2018
Specialization			
PhD	Chemistry	Università degli studi di Salerno	2022
Master			
Degree of specialization medical			
Degree of specialization European			
Other			

REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date of registration	Association	City

Università degli Studi di Milano - Divisione Stipendi e Carriere del Personale
Ufficio Contratti di formazione e Ricerca
Via Sant'Antonio 12 - 20122 Milano, Italia
Assegni.postdoc@unimi.it

2019	Società Chimica Italiana	Milano

FOREIGN LANGUAGES

Languages	level of knowledge
English	B1

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2018	PhD scholarship at Università degli studi di Salerno
2019	Scholarship for 1st HR-MS SCHOOL 2019
2021	Scholarship for ISOS 2021
2021	Scholarship for CDCO 2021

TRAINING OR RESEARCH ACTIVITY

Bachelor's Degree 2011-2015, University of Salerno; supervisor: Prof. Chiara Costabile

6-month internship, focused on the synthesis of NHC-Pd(II) complexes and their application in BuchwaldHartwig amination. The complexes were then fully characterized, NMR, IR, melting point, UV-Vis spectroscopy. The catalytic activity was studied by GC-MS (Maldi- TOF) analysis of the reaction mixture.

Master's Degree 2015-2018, University of Salerno; supervisors: Prof. Chiara Costabile Prof. Mina Mazzeo

Internship of 12 months, focused on the synthesis of chiral NHC/phenoxy-imine hybrid mono- and di- nucleant ligands and the study of the corresponding zinc coordination chemistry. In particular, my attention was on the synthesis of the hybrid mono and bi-nucleant ligands bearing both phenoxy-imine and NHC functionalities. The complexes were then fully characterized, NMR, IR, melting point, UV-Vis spectroscopy. The mono-nucleant Zn(II) complex was then used for the Ring Opening Polymerization (ROP) of epoxides (propylene oxide and cyclohexene oxide) and cyclic esters in the presence of a Lewis acid as $B(C_6F_5)_3$. Good activities were observed in cyclic esters (ε-caprolactone and rac/L-lactide) polymerization also with a good control of the polymer molecular weight. The obtained polymers were characterized by NMR, UV-Vis spectroscopy, GPC analysis, Maldi-Tof mass spectrometry. All this allowed me to learn the work through Schlenck technic, the use of the various tools mentioned above, the various techniques related to the synthesis of air-sensitive complexes, I also learned the maintenance of ramps and vacuum pumps.

PhD in Chemistry 2018-2022, Università degli studi di Salerno; supervisors: Prof. Alessandra Lattanzi, Prof. Maurizio Benaglia

3 years PhD industrial project, carried out at the University of Salerno in collaboration of University of Milano and Laboratori Alchemia. My research focused on the synthesis of API and their fluorinated intermediates both in batch than in flow conditions. The project included the developing of organocatalytic synthetic methodology for introduction of trifluoromethylthio group in alfa position of carboxylic acid derivatives and their furthermore manipulation. In particular, a convenient metal-free and catalytic onepot route for the introduction of SCF_3 group at □-position of carboxylic acid derivatives via *N*-acyl pyrazoles as surrogates was developed, amenable to mild conditions for enolate formation and simple transformation in one-pot fashion,

into amides, esters, or carboxylic acids. Furthermore, with the attempt to develop more convenient synthesis also suitable for industrial applications, a telescopic synthesis of the same products, starting directly from commercial sources by exploiting the flow chemistry technology, has been developed. With this strategy, the environmental footprint and the reaction time of the one-pot process are considerably reduced, minimizing the waste production and avoiding purification of the intermediates. The last part of this doctoral thesis has been focused on the asymmetric organocatalytic synthesis of trifluoromethyl-substituted compounds bearing a quaternary stereocenter. A first one-pot enantioselective organocatalytic Michael reaction to prepare highly enantioenriched triflones bearing a quaternary stereocenter has been developed, starting from easily enolizable aryl acetic triflone esters and acryloyl pyrazole. The one-pot methodology enables to obtain a variety of aryl-substituted triflones working under mild reaction conditions.I have had the opportunity to refine all the techniques mentioned in previous experiences, furthermore, due to the research topics, I have learned and particularly refined NMR spectroscopy (300MHz, 400MHz, 600MHz) from totally manual to fully automated instruments. I had the opportunity to explore and study different nuclei: 1H, 13C, 19F, as well as experiences at low and high temperatures. I also had the opportunity to learn and deepen the use of the TopSpin and Mestrenova programs. I also learned about the use of HRMS and chiral HPLC.

Post-Doctorate in organic synthesis 02/2022 – 01/2023, Università degli studi di Pavia; supervisor: Prof. Giuseppe Zanoni.

12 months post-doctorate at the Università degli studi di Pavia. My research focused on the study an enantioselective approach in the polyene cyclization to afford bioactive compounds. The idea is to use a chiral anionic pair composed by a chiral primary amine and a Bronsted acid with axial chirality to promote a domino cascade of electron cyclize an acyclic, polyene chain substrate. The project started with the preparation of different polyolefinic substrates with the following functional groups such as unsatured aldehyde and an electronrich aromatic ring, hot point for biomimetic cyclization. During this period, I expand my knowledge to the total synthesis and to a new approach of the synthesis. I also had the opportunity to interface directly with the company that manufactures the instrument and therefore refining my relational skills. In the group I then worked in the order preparation for the purchase chemical reagents. I also dealt with the reorganization and updating of the reagent inventory, the selection and preparation for the disposal of dangerous as well as responsible for receiving orders.

Post-Doctorate in organic synthesis 02/2023 – 01/2024, Università degli studi di Milano; supervisor: Prof. Maurizio Benaglia.

12 months post-doctorate at the Università degli studi di Milano. My research focused on the development of new catalysts and their application in organic synthesis. Firstly, I studied the regio diastero and stereo selective redaction of terminal nitro dienes and their manipulation to afford highly functionalized derivatives. In the second part of this project, new attempts to outline innovative synthetic methodologies promoted by organocatalysts.

During this period, I expand my knowledge to the use and maintenance of instrumentst as Banchtop NMR, or mass spectrometry. In the group I dealt with the reorganization and updating of the reagent inventory, the selection and preparation for the disposal of dangerous as well as responsible for receiving orders.

PROJECT ACTIVITY-Work Experience

Year	Project
2022-2023	Postdoctoral fellowship, Università degli Studi di Pavia; supervisor: Prof. Giuseppe Zanoni

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2023 -to now	Postdoctoral fellowship, Università degli Studi di Milano; supervisor: Prof. Maurizio Benaglia

PATENTS

Patent

CONGRESSES AND SEMINARS

Date	Title	Place
09/2019	XXXIX Convegno Nazionale della divisione di Chimica Organica, SCI	Torino
12/2019	1st HR-MS SCHOOL	Salerno
05/2021	XLV "A. CORBELLA"	Online
09/2021	XVII Congresso nazionale della società chimica italiana; oral communication	Online
05/2023	ISPROCHEM 2023	Gargnano
11/2023	Italian Flow Chemistry Simposium 2023	Milano

PUBLICATIONS

Books
[title, place, publishing house, year …]

Articles in journals
Franco, F., Meninno, S., Benaglia, M., Lattanzi, A., Formal α-trifluoromethylthiolation of carboxylic acid derivatives: Via N -acyl pyrazoles, *Chem. Comm.*, **2020**, *56(20),* 3073–3076.
Meninno, S., Franco, F., Benaglia, M., Lattanzi, A., Pyrazoleamides in Catalytic Asymmetric Reactions: Recent Advances, *Adv. Synt. Cat.*, **2021**, *363(14)*, 3380–3410.
Franco, F., Meninno, S., Lattanzi, A., Puglisi, A., Benaglia, M., Continuous Flow Synthesis of αTrifluoromethylthiolated Esters and Amides from Carboxylic Acids: A Telescoped Approach, *J. Org. Chem.,* **2021**, *86(20)*, 14207–14212.
Franco, F., Meninno, S., Overgaard, J., Benaglia, M., Lattanzi, A., Catalytic Enantioselective Entry to Triflones Featuring a Quaternary Stereocenter, *Org. Lett.*, **2022**, *24(24*), 4371–4376.
Ferrentino, N., Franco, F., Grisi, F., Pragliola, S., Mazzeo, M., Costabile, C., Ring opening polymerization of lactide promoted by Zinc and Magnesium complexes with a N-heterocyclic carbene-phenoxy-imine hybrid non-innocent ligand, *Mol. Cat.,* **2022**, *533*, 112799-112811.
Faverio, C., Franco, F., Taini, G., Raimondi, L., Benaglia, M., Organocatalytic AsymmetricR of □-Nitro dienes: a viable entry to functionalized amines and highly substituted enantioenriched cyclopentanes, *Eur. J. Org. Chem.,* **2023**, e202301043.

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Congress proceedings
One-pot synthesis of □-trifluoromethylthiolated carboxylic acid derivatives, Poster, XXXIX Convegno Nazionale della Divisione di Chimica Organica della Società Chimica Italiana, 2019, Torino
From batch to flow chemistry: synthesis of □-trifluoromethylthiolated carboxylic acid derivatives, Oral communication, XLV ISOS, 2021, Webinar
Formal α-trifluoromethylthiolation of carboxylic acid derivatives via N-acyl pyrazoles. Oral Communication. XXVII congresso nazionale della società chimica italiana, 2021, Webinar

OTHER INFORMATION

Expert in the use of Microsoft Office, ChemDraw, TopSpin, Mestrenova, SciFinder, Reaxys, Internet.
Driving License: B
Account Linkedln: https://www.linkedin.com/in/francesca-franco-5a6698b8 Account Research Gate: https://www.researchgate.net/profile/Francesca-Franco-4 ORCID ID: https://orcid.org/0009-0007-6652-4543 Scopus ID: 57215670861
Passion for travel and books.
H. Index: 4; total citation: 37; articles accepted: 6

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Place and date: _____Milano_____, ____04/01/2024_____

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