PNRR

Missione "Istruzione e Ricerca", Missione 4, Componente 2, Investimento 1.5

Ecosistema MUSA – Multilayered Urban Sustainability Action

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Who and Where are we?

PNRR

Ecosistema MUSA – Multilayered Urban Sustainability Action

Proponente: **Università degli Studi di Milano-Bicocca**

Soggetti partecipanti totali: 24

Numero Università partecipanti: **5**

Numero Privati partecipanti: **19**

Finanziamento Concesso: **109,996,000,50 euro**

Gli obbiettivi del Centro

La linea prioritaria dell'ecosistema MUSA rientra nell'ambito dell'area «Clima, Energia, Mobilità sostenibile» del Piano Nazionale della Ricerca (PNR). MUSA ha l'ambizione di trasformare l'area metropolitana di Milano in un ecosistema di innovazione per la rigenerazione urbana, intervenendo in diversi ambiti, da quello sociale a quello tecnologico, per diventare un modello nazionale ed europeo.

Spoke	Coordinator	Pubblic Affiliates	Private Affiliates
1. Urban regeneration (City of tomorrow)	**UNIMIB**	POLIMI, UNIMI	UNIBOCCONI, ENI, EDISON, PIRELLI, THALES
2. Big Data-Open Data in Life Sciences	**UNIMI**	POLIMI, UNIMIB	UNIBOCCONI, ALMAVITA, TIM, NOVARTIS, BIO4DREAMS, ASTRAZENECA, BRACCO
3. Deep Tech: Entrepreneurship & Technology Transfer	**POLIMI**	UNIMI, UNIMIB	UNIBOCCONI, FONDAZIONE POLIMI, OI, CAMOZZI, HUAWEI, INFINEON, A2A, HUMANITAS
4. Economic impact and sustainable finance	**UNIBOCCONI**	POLIMI, UNIMIB, UNIMI	FBK, RCS
5. Sustainable Fashion, Luxury and Design	**POLIMI**	UNIMI, UNIMIB	UNIBOCCONI, LUMSON
6. Innovation for Sustainable and Inclusive Societies	**UNIMIB**	POLIMI, UNIMI	UNIBOCCONI, EDISON, OI, THALES

Spoke 2 - WP1 tasks from proposal

WP1 Leader: Claudio A. Ardagna

Big Data-Open Data in Life Sciences will develop an innovative digital platform for fast and secure storage and exchange of big data in life sciences, translate basic research into application aiming to improve Nutritional, healing and enviromental condition of citizens, organize data collection and processing with AI techniques [Spoke 2]

- **WP 1.** The goal of the WP is to create a novel digital infrastructure for the rapid exchange of data related to life sciences, medicine, and their inference by means of machine learning and artificial intelligence. The WP will define a holistic, innovative edge-network-cloud platform for the storage and safe exchange of big data for life sciences.
  - **Task 1.1 A novel architecture for big data exchange:** a platform will be created for the management of the whole lifecycle of biomedical data and information coming from the monitoring of human behaviors, fully respecting all data protection regulations.
  - **Task 1.2 Governance, management, and regulation of the access to services of data in silico:** this task deals with the governance, management, and regulatory actions related to the access to the services for elaborating the biomedical data, creating a marketplace of services based on the emerging needs of the research community. Services include i) interfaces for the platforms built for data collection ii) key nodes for collecting and giving value to the data flows from sensors iii) centralised or decentralised models to use and give value to data to calculate relevant inferences for life science

Our Role Task Leader: Prof. Maurizio Benaglia:

SPOKE 2. WP1. Task 1.2.4 Digital Strategies for Active Ingredients Synthesis for Pharma

Digital and technology-driven strategies for the development of innovative and sustainable synthesis of active ingredients and crucial intermediates, including antivirals, according to the green chemistry and circular economy principles.

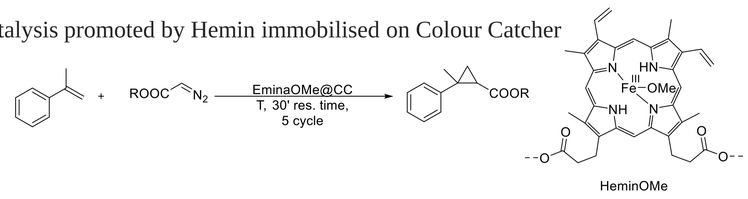
Crucial elements and key technologies for the task will be: development of Flow chemistry for ML-controlled accelerated reactions; design, implementation and optimization of organic transformation under continuous flow conditions; development of an automated research line for organic chemistry synthesis of products of interest for high value pharma drug design.

- Intelligent Automation of Organic Synthesis:
  - Flow chemistry for ML- controlled accelerated reactions development
  - Evaluation, assessment and insertion of results in pharmaceutic value-chains
- Value for UNIMI:
  - Automated research line for organic chemistry research
  - Products of interest for high value pharma drug design

Flow Tecnology: ASIA Syrris

With Prof.ssa Gallo group

Catalysis promoted by Hemin immobilised on Colour Catcher



With Prof. Benaglia- Prof.ssa Puglisi – Prof. Rossi – Prof.ssa Raimondi

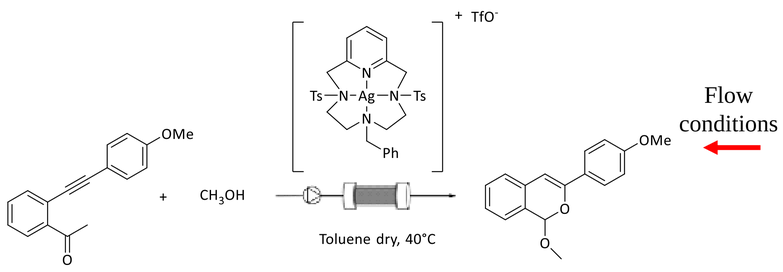
- Silica-supported yttrium triflate
- Light-driven Favorsky rearrangment
- Electrochemical chlorinations of aromatic rings
- Electrochemical pinacol coupling reactions
- Ni/photoredox catalytic synthesis of tryptamine derivatives

Flow conditions

Flow conditions

With Prof. Caselli – Prof. Abbiati group

Regiospecific synthesis catalyzed by silica supported Ag(I)



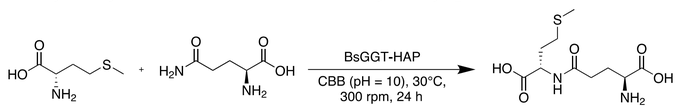
Flow conditions

Flow conditions

Flow conditions

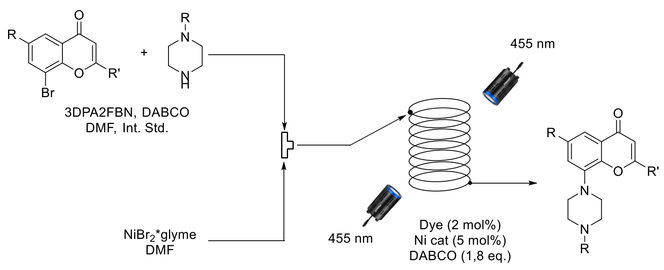
With Prof.ssa Speranza – Prof. Morelli, Prof.ssa Gervasini groups

Catalysis by BsGGT immobilised on Hydroxyapatite

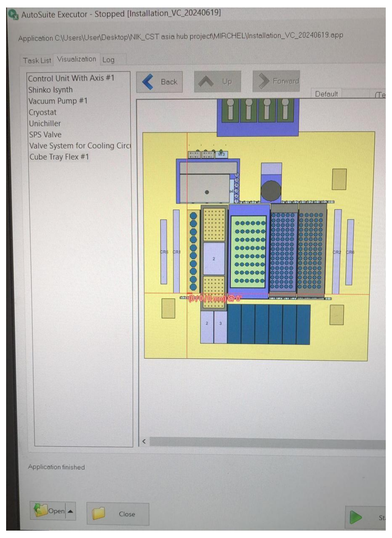


With Prof. Pignataro – Prof.ssa Bernardi –Prof.ssa Belvisi group

Ni/photoredox catalytic C-N cross-coupling for the synthesis of APIs



Automation: Chemspeed FLEX ISynth



Ongoing the first tests!

We thank MUSA – Multilayered Urban Sustainability Action – project, funded by the European Union – NextGenerationEU, under the National Recovery and Resilience Plan (NRRP) Mission 4 Component 2 Investment Line 1.5: Strenghtening of research structures and creation of R&D "innovation ecosystems", set up of "territorial leaders in R&D"

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Ministero dell'Università e della Ricerca

Italiadomani

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