Dr. Fausta Ulgheri

Curriculum Vitae et Studiorum

Position
Researcher at the Italian National Research Council (CNR)-Istituto di Chimica Biomolecolare (ICB)
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Research Activity
Key Words: Organic Chemistry; Total Synthesis; Green Chemistry; Multicomponent Reactions; Atom Economy; Catalysis; Medicinal Chemistry; Drug Discovery.

Development of new synthetic green protocols; Design, and synthesis of new biologically active molecules. In particular recently:
Design and synthesis of proteolysis targeting chimeras (PROTACS) as antivirals agents against SARS-CoV-2;
Design and synthesis of non-covalent and non-peptidic inhibitors of caspase-1, for the treatment of dysregulated immune response in neurodegenerative diseases, cancer and in SARS-CoV-2 induced multisystemic inflammation;
Synthesis of Telomerase's inhibitors as anticancer.

Education and Fellowships
Chemistry degree (106/110) at the University of Sassari (Italy), Faculty of Sciences, with the thesis "Total Synthesis of Indolizidine Alkaloids" (*Journal Chem. Soc. Perkin Trans. I*, **1993**, 2991-2997), under the supervision of Prof. Giovanni Casiraghi.

1. Postdoctoral fellowship at the University of Cape Town under the supervision of prof. Kelly Chibale on the total synthesis of trypanothione reductase peptidomimetic inhibitors for tropical diseases, awarded by the Foundation for Research and Development (FRD) (Pretoria-South Africa).
2. Postdoctoral fellowship "EC Human Capital and Mobility Network" at the University of Stuttgart (Germany) under the supervision of prof. Volker Jager on the total synthesis of polyhydroxylated alkaloids as glycosidase inhibitors;
3. EU-FSE postdoctoral fellowship at the CNR Italian National Research Council (Italy) under the supervision of Dr. Giovanna Delogu on the total synthesis of pyrethroids;
4. Fellowship at the University of Sassari (Italy) under the supervision of prof. Antonio Saba and Dr. Giorgio Chelucci on the synthesis of chiral ligands for asymmetric catalysis;
5. Fellowship at the CNR Italian National Research Council (Italy) under the supervision of Dr. Emma Fenude on the synthesis of bioactive peptides and transmembrane molecular channels;

Advanced Training Courses:
1. *BioTTasa Winter School- Training Course for Technology Transfer,* Parco tecnologico della Sardegna, Pula (CA)-Italy 11-13 February and 11-13 March 2015.
2. *Advances in Synthetic Chemistry: Multi Component Reactions*; Prof. Alexander Doemling**,** Frankfurt-Germany, 8-9 April 2008
3. *Frontiers in Organic Chemistry (ACS Short Courses),* Prof. Barry Trost; Stanford University, Palo Alto, San Francisco-California 23-28 June 2003
4. *1st Summer school on Glycobiology and Glycochemistry,* Lausanne-Switzerland 2-4 June 1993

Research Projects
1. September 2021-at present associated investigator in the project FISR (Life Science) "Development of new immunomodulating molecules for the prophylaxis and treatment of severe COVID-19 symptoms" (IMO4CoV), funded by the Italian Ministry for Research (MUR). Principal investigator Prof. Angelo Fontana (University of Napoli).
2. PRIN2020 at present scientific leader of the WP "Tetrazole-Based Peptidomimetic Catalysts" for studying chiral multicomponent reactions, in the project "Natural Products-Assisted Organic Synthesis, funded by Italian MUR. Project leader Prof. Luca Bernardi (University of Bologna).

3. July 2019-at present associated investigator in the project "Green Chemistry in Drug Discovery: Sustainable Synthesis of New Telomerase Inhibitors" funded by Regione Sardegna. Principal investigator Prof. Lidia De Luca (University of Sassari);
4. September 2013-2016 associated investigator in the project "Finding New Leads for Neurodegenerative Diseases" funded by Regione Sardegna. Principal investigator Dr. Pietro Spanu.
5. September 2011-November 2012 co-principal investigator of the research project "Synthesis of Spiroketals with anticancer Activity", funded by Fase1 Regione Sardegna.
6. September 2004-December 2006 co-principal investigator of the research project: "*Synthetic Studies for the Preparation of Scaffolds, Monomers, Tools and Final Leads Compounds of Interest for Central Nervous System Diseases",* funded by GlaxoSmithKline.

Selected Publications:

1. Fausta Ulgheri, P. Spanu, F. Deligia, G. Loriga, M. P. Fuggetta, I. de Haan, A. Chandgudge, M. Groves, A. Domling**,** Design, synthesis and biological evaluation of 1,5-disubstituted α-amino tetrazole derivatives as non-covalent inflammasome-caspase-1 complex inhibitors with potential application against immune and inflammatory disorders, *European Journal of Medicinal Chemistry,* **2021***, in press accepted for publication doi.org/10.1016/j.ejmech.2021.114002.*
2. P. Spanu, MP. Fuggetta, Fausta Ulgheri, F. Deligia, P. Carta, A. Mannu, V. Trotta, R. De Cicco, A. Barra, E. Zona, F. Morelli, A new synthetic spiroketal: studies on antitumor activity on murine melanoma model In vivo and mechanism of action In vitro, *Anticancer Agents in Medicinal Chemistry* **2019,** 4, 567-578.
3. Pietro Spanu; Fausta Ulgheri, An Efficient Chemical Conversion of Glycerol to Dihydroxyacetone, *Chemistry, Select* **2018**, *3*, 11569–11572.
4. Fuggetta, M. P.; De Mico, A.; Cottarelli, A.; Morelli, F.; Zonfrillo, M.; Fausta Ulgheri.; Peluso, P.; Mannu, A.; Deligia, F.; Marchetti, M.; Roviello, G., Reyes Romero, A.; Dömling, A.; Spanu, P., Synthesis and Enantiomeric Separation of a Novel Spiroketal Derivative: A Potent Human Telomerase Inhibitor with High in Vitro Anticancer Activity, *J. Med. Chem.* **2016***, 59,* 9140−9149.
5. Spanu, P., Mannu, A., Fausta Ulgheri; An Unexpected reaction of Pyridine with Acetyl Chloride to give Dihydropyridine and Pyperidine Derivatives, *Tetrahedron Letters* **2014**, *55*, 1939-1942.
6. Spanu, Pietro, De Candia, Cristina, Fausta Ulgheri; 5-Trihydroxypropyl-dihydrouracil derivatives as precursors of 1-azasugars: application to the stereoselective synthesis of D-galacto-isofagomine *Tetrahedron Letters* **2010**, *51*, 2400–2402.
7. Fausta Ulgheri, Daniela Giunta, Pietro Spanu; Short and Higly Stereoselective Total Synthesis of D-ribo-configured Ureido Sugars, *Tetrahedron*, **2008,** *64***,** 11768.
8. Pietro Spanu, Fausta Ulgheri; Synthetic Approaches to Carbohydrate Based Ureas, *Current of Organic Chemistry* **2008**, *12*, 1071.
9. M. Marchetti, S. Paganelli, D. Carboni, Fausta Ulgheri, G. Del Ponte; Synthesis of Indole Derivatives by Domino Hydroformilation/Indolazion of 2-Nitrocinnamaldheydes, *Journal of Molecular Catalysis A: Chemical*, 2008, *288,* 103.
10. Fausta Ulgheri, Mauro Marchetti, Oreste Piccolo; Enantioselective Synthesis of (S)- and (R)-Tolterodine by Asymmetric Hydrogenation of a Coumarin Derivative Obtained by a Heck Reaction, *Journal of Organic Chemistry*, **2007**, *72*, 6056.
11. Pietro Spanu**,** Fausta Ulgheri; Advances in Asymmetric Synthesis of Biologically Active Molecules Using Heterocycles as Building Blocks, *Targets in Heterocyclic Systems,* O. A. Attanasi and D. Spinelli, Ed., Vol. 8, Società Chimica Italiana, **2005**.
12. Fausta Ulgheri, G. Orrù, M. Crisma, P. Spanu; Diastereoselective Synthesis of 5-(alditol-1-C-yl)-hydantoins and their use as precursors of polyhydroxylated-α-amino acids, *Tetrahedron Letters* **2004**, *45*, 1047-1050.
13. Fausta Ulgheri, J. Bacsa, L. Nassimbeni, P. Spanu; Use of 1,3-dibenzyl-dihydrouracil in the chain extension of 2,3-O-isopropylidene-D-glyceraldehyde, *Tetrahedron Letters* **2003**, *44*, 671-675.

Patents

1. A. Domling, P. Spanu, Fausta Ulgheri, *Novel Caspase Inhibitors***, 2018**, *EP 3 666 769 A1*
2. Pietro Spanu, Fausta Ulgheri, *Method for the Selective Oxidation of Glycerol to Dihydroxyacetone,* **2014**, WO/2014/102840
3. Oreste Piccolo, Fausta Ulgheri, Mauro Marchetti, *Enantioselective Synthesis of Enantiomerically Enriched Compounds*, **2005,** PCT WO 2005/005356.