

Prof. Massimo Curini

Professore Ordinario di Chimica Organica-SSD Chim 06

Full Professor in Organic Chemistry



Temi di ricerca: Studio e applicazione di nuovi sistemi catalitici e sistemi di riscaldamento non convenzionali (Microonde e Q-Tube) per lo sviluppo di processi sintetici con maggiore sostenibilità volti alla preparazione di fine chemicals e composti con attività biologica (naturali e non). Catalisi, Ottimizzazione di processi sintetici, catalizzatori supportati su matrici polistireniche, Green chemistry in mezzi di reazioni alternativi. Isolamento e determinazione strutturale di metaboliti secondari.

Evaluation and applications of new catalytic processes and new heating systems (Microwaves and Q-tube) for the development of ecofriendly synthetic processes for the preparation of fine chemicals and biologically active compounds (natural and non-natural). Catalysis: new polystyrene-matrixes supported catalysts. Green Chemistry: studies on new reaction systems. Isolation and structure determination of secondary metabolites.

Coordinamento: Delegato del Rettore per il Polo Scientifico-Didattico di Terni. Coordinatore del Progetto di ricerca "Resine dal Messico" finanziato dalla Cassa di Risparmio di Terni.

Rector delegate (University of Perugia- Scientific and learning center in Terni). Project leader of the Cassa di Risparmio-Terni supported project entitled "Resins from Mexico".

Collaborazioni: Prof. D. Ricci- Università di Urbino (studio dell'attività antiossidante e antifungina); Dr. S. Sosa-Università di Trieste (studio dell'attività antiinfiammatoria); Prof. F. Menichini-Università della Calabria (studio dell'attività citotossica).

Estero: Prof. J. Gertsch- University of Bern (Switzerland) (studio dell'attività sul sistema endocannabinoide); Prof. R.E. Robles Zepeda-Universidad de Sonora, Hermosillo (Mexico) (studio dell'attività antitumorale); Dr. Y. Obara-University of Tohoku, Sendai (Japan) (studio sull'attività neuroprotettiva).

Prof. D. Ricci- Università di Urbino (studio dell'attività antiossidante e antifungina); Dr. S. Sosa-Università di Trieste (studio dell'attività antiinfiammatoria); Prof. F. Menichini-Università della Calabria (studio dell'attività citotossica).

Collaborations Prof. D. Ricci- Università di Urbino (evaluation of antioxidant and antifungal activity); Dr. S. Sosa-Università di Trieste (evaluation of antiinflammatory activity); Prof. F. Menichini-Università della Calabria (evaluation of cytotoxic activity).

Prof. J. Gertsch- University of Bern (Switzerland) (evaluation of the activity on the endocannabinoid system);

Prof. R.E. Robles Zepeda-Universidad de Sonora, Hermosillo (Mexico) (evaluation of the antitumoral

activity); Dr. Y. Obara-University of Tohoku, Sendai (Japan) (evaluation of the neuroprotective activity).

Pubblicazioni degli ultimi 5 anni (2009-2013):

1. Collinin reduces *Porphyromonas gingivalis* growth and collagenase activity and inhibits the lipopolysaccharide-induced macrophage inflammatory response and osteoclast differentiation and function. Santos, Juliana; Marquis, Annie; Epifano, Francesco; Genovese, Salvatore; Curini, Massimo; Grenier, Daniel. *Journal of Periodontology* (2013), 84(5), 704-711.

2. Conjugation of L-NAME to prenyloxycinnamic acids improves its inhibitory effects on nitric oxide production. Genovese, Salvatore; Epifano, Francesco; Fiorito, Serena; Curini, Massimo; Marrelli, Mariangela; Menichini, Francesco; Conforti, Filomena. *Bioorganic & Medicinal Chemistry Letters* (2013), 23(10), 2933-2935.

3. Furanodien-6-one from *Commiphora erythraea* inhibits the NF- κ B signalling and attenuates LPS-induced neuroinflammation. Bellezza, Ilaria; Mierla, Annalisa; Grottelli, Silvia; Marcotullio, Maria Carla; Messina, Federica; Roscini, Luca; Cardinali, Gianluigi; Curini, Massimo; Minelli, Alba. *Molecular Immunology* (2013), 54(3-4), 347-354.

4. Erbium(III) Chloride in Ethyl Lactate as a Smart Ecofriendly System for Efficient and Rapid Stereoselective Synthesis of trans-4,5-Diaminocyclopent-2-enones. Procopio, Antonio; Costanzo, Paola; Curini, Massimo; Nardi, Monica; Oliverio, Manuela; Sindona, Giovanni. *ACS Sustainable Chemistry & Engineering* (2013), 1(5), 541-544.

5. Efficient synthesis of cyanohydrin trimethylsilyl ethers via 1,2-chemoselective cyanosilylation of carbonyls. Strappaveccia, Giacomo; Lanari, Daniela; Gelman, Dmitri; Pizzo, Ferdinando; Rosati, Ornelio; Curini, Massimo; Vaccaro, Luigi. *Green Chemistry* (2013), 15(1), 199-204.

6. Antigenotoxic effect, composition and antioxidant activity of *Dendrobium speciosum*. Moretti, Massimo; Cossignani, Lina; Messina, Federica; Dominici, Luca; Villarini, Milena; Curini, Massimo; Marcotullio, Maria Carla. *Food Chemistry* (2013), 140(4), 660-665.

7. Ferrier Rearrangement and 2-Deoxy Sugar Synthesis from D-Glycals Mediated by Layered α -Zirconium Sulfohenylphosphonate-Methanphosphonate as Heterogeneous Catalyst. Rosati, Ornelio; Curini, Massimo; Messina, Federica; Marcotullio, Maria Carla; Cravotto, Giancarlo. *Catalysis Letters* (2013), 143(2), 169-175.
8. Quantitative Evaluation of Auraptene and Umbelliferone, Chemopreventive Coumarins in Citrus Fruits, by HPLC-UV-FL-MS. Mercolini, Laura; Mandrioli, Roberto; Ferranti, Anna; Sorella, Vittorio; Protti, Michele; Epifano, Francesco; Curini, Massimo; Raggi, Maria Augusta. *Journal of Agricultural and Food Chemistry* (2013), 61(8), 1694-1701.
9. Screening for oxyprenylated anthraquinones in Mediterranean *Rhamnus* species. Genovese, Salvatore; Epifano, Francesco; Curini, Massimo; Kremer, Dario; Carlucci, Giuseppe; Locatelli, Marcello. *From Biochemical Systematics and Ecology* (2012), 43, 125-127.
10. Cinnabarinic acid, an endogenous metabolite of the kynurenine pathway, activates type 4 metabotropic glutamate receptors. Fazio, F.; Lionetto, L.; Molinaro, G.; Bertrand, H. O.; Acher, F.; Ngomba, R. T.; Notartomaso, S.; Curini, M.; Rosati, O.; Scarselli, P.; et al. *Molecular Pharmacology* (2012), 81(5), 643-656.
11. Antibacterial properties of auraptene and oxyprenylated naturally occurring benzoic and cinnamic acids Curini, Massimo; Epifano, Francesco; Messina, Federica; Genovese, Salvatore. *Boletin Latinoamericano y del Caribe de Plantas Medicinales y Aromaticas* (2012), 11(1), 74-76.
12. Searching for novel cancer chemopreventive plants and their products: the genus *Zanthoxylum*. Epifano, Francesco; Curini, Massimo; Marcotullio, Maria Carla; Genovese, Salvatore. *Current Drug Targets* (2011), 12(13), 1895-1902.
13. Ytterbium triflate catalysed Meerwein-Ponndorf-Verley (MPV) reduction. Mollica, Adriano; Genovese, Salvatore; Pinnen, Francesco; Stefanucci, Azzurra; Curini, Massimo; Epifano, Francesco. *Tetrahedron Letters* (2012), 53(7), 890-892.
14. Protective effects of Commiphora erythraea resin constituents against cellular oxidative damage. Marcotullio, Maria Carla; Messina, Federica; Curini, Massimo; Macchiarulo, Antonio; Cellanetti, Marco; Ricci, Donata; Giamperi, Laura; Bucchini, Anahi; Minelli, Alba; Mierla, Anna Lisa; et al. *Molecules* (2011), 16, 10357-10369.
15. Inhibition of COX-1 activity and COX-2 expression by 3-(4'-geranyloxy-3'-methoxyphenyl)-2-trans propenoic acid and its semi-synthetic derivatives. Genovese, Salvatore; Curini, Massimo; Gresele, Paolo; Corazzi, Teresa; Epifano, Francesco. *Bioorganic & Medicinal Chemistry Letters* (2011), 21(19), 5995-5998.
16. Chromatographic Methods for Metabolite Profiling of Virus- and Phytoplasma-Infected Plants of *Echinacea purpurea*. Pellati, Federica; Epifano, Francesco; Contaldo, Nicoletta; Orlandini, Giulia; Cavicchi,

Lisa; Genovese, Salvatore; Bertelli, Davide; Benvenuti, Stefania; Curini, Massimo; Bertaccini, Assunta; et al. *Journal of Agricultural and Food Chemistry* (2011), 59(19), 10425-10434.

17. Growth inhibitory activities of oxyprenylated and non-prenylated naturally occurring phenylpropanoids in cancer cell lines. Bruyere, Celine; Genovese, Salvatore; Lallemand, Benjamin; Ionescu-Motatu, Alexandra; Curini, Massimo; Kiss, Robert; Epifano, Francesco. *Bioorganic & Medicinal Chemistry Letters* (2011), 21(14), 4174-4179.

18. The influence of collection zone on glucosinolates, polyphenols and flavonoids contents and biological profiles of *Capparis sicula* ssp. *Sicula*. Conforti, F.; Marcotullio, M. C.; Menichini, F.; Statti, G. A.; Vannutelli, L.; Burini, G.; Curini, M. *From Food Science and Technology International* (London, United Kingdom) (2011), 17(2), 87-97.

19. An alternative quinoline synthesis by via Friedlaender reaction catalyzed by Yb(OTf)₃. Genovese, Salvatore; Epifano, Francesco; Marcotullio, Maria Carla; Pelucchini, Caroline; Curini, Massimo. *Tetrahedron Letters* (2011), 52(27), 3474-3477.

20. In vitro effects of natural prenyloxycinnamic acids on human cytochrome P450 isozyme activity and expression. Genovese, S.; Epifano, F.; Curini, M.; Menger, D.; Zembruski, N. C. L.; Weiss, J. *Phytomedicine* (2011), 18(7), 586-591.

21. Ytterbium triflate promoted one-pot three component synthesis of 3,4,5-trisubstituted-3,6-dihydro-2H-1,3-oxazines. Epifano, Francesco; Pelucchini, Caroline; Rosati, Ornelio; Genovese, Salvatore; Curini, Massimo. *Catalysis Letters* (2011), 141(6), 844-849.

22. α -Zirconium Sulfophenylphosphonate as a Catalyst for the Synthesis of 3,4-Dihydropyrimidin-2(1H)-One Derivatives Under Solvent Free Conditions. Rosati, Ornelio; Curini, Massimo; Montanari, Francesca; Nocchetti, Morena; Genovese, Salvatore. *Catalysis Letters* (2011), 141(6), 850-853.

23. Use of HPLC in the Determination of the Molar Absorptivity of 4'-Geranyloxyferulic Acid and Boropinic Acid. Locatelli, Marcello; Carlucci, Giuseppe; Genovese, Salvatore; Curini, Massimo; Epifano, Francesco. *Chromatographia* (2011), 73(9-10), 889-896.

24. An eco-sustainable erbium(III) triflate catalyzed formation and cleavage of tert-butyl ethers. Procopio, Antonio; Costanzo, Paola; Curini, Massimo; Nardi, Monica; Oliverio, Manuela; Paonessa, Rosina. *Synthesis* (2011), (1), 73-78.

25. Topical anti-inflammatory activity of boropinic acid and its natural and semi-synthetic derivatives. Epifano, Francesco; Sosa, Silvio; Tubaro, Aurelia; Marcotullio, M. Carla; Curini, Massimo; Genovese, Salvatore. *Bioorganic & Medicinal Chemistry Letters* (2011), 21(2), 769-772.

26. Ytterbium triflate catalyzed synthesis of β -functionalized indole derivatives. Epifano, Francesco; Genovese, Salvatore; Rosati, Ornelio; Tagliapietra, Silvia; Pelucchini, Caroline; Curini, Massimo. *Tetrahedron Letters* (2011), 52(5), 568-571.
27. In situ cross-linked chitosan Cu(I) or Pd(II) complexes as a versatile, eco-friendly recyclable solid catalyst. Martina, Katia; Leonhardt, Silke E. S.; Ondruschka, Bernd; Curini, Massimo; Binello, Arianna; Cravotto, Giancarlo. *Journal of Molecular Catalysis A: Chemical* (2011), 334(1-2), 60-64.
28. Editorial
Curini, Massimo. *Current Organic Chemistry* (2010), 14(20), 2365.
29. Antibacterial and Anti-inflammatory Activities of 4-Hydroxycordoin: Potential Therapeutic Benefits. Feldman, Mark; Tanabe, Shin-Ichi; Epifano, Francesco; Genovese, Salvatore; Curini, Massimo; Grenier, Daniel. *Journal of Natural Products* (2011), 74(1), 26-31.
30. Auraptene is an inhibitor of cholesterol esterification and a modulator of estrogen receptors. de Medina, Philippe; Genovese, Salvatore; Paillassé, Michael R.; Mazaheri, Mahta; Caze-Subra, Stephanie; Bystricky, Kerstin; Curini, Massimo; Silvente-Poirot, Sandrine; Epifano, Francesco; Poirot, Marc. *Molecular Pharmacology* (2010), 78(5), 827-836.
31. Ytterbium triflate catalyzed synthesis of chlorinated lactones. Genovese, Salvatore; Epifano, Francesco; Pelucchini, Caroline; Procopio, Antonio; Curini, Massimo. *Tetrahedron Letters* (2010), 51(46), 5992-5995.
32. Quantification of 4'-geranyloxyferulic acid, a new natural colon cancer chemopreventive agent, by HPLC-DAD in grapefruit skin extract. Genovese, S.; Epifano, F.; Carlucci, G.; Marcotullio, M. C.; Curini, M.; Locatelli, M.. *Journal of Pharmaceutical and Biomedical Analysis* (2010), 53(2), 212-214.
33. Prenyloxyphenylpropanoids as a novel class of anti-inflammatory agents. Genovese, Salvatore; Curini, Massimo; Epifano, Francesco. *Anti-Inflammatory & Anti-Allergy Agents in Medicinal Chemistry* (2010), 9(2), 158-165.
34. A natural propenoic acid derivative activates peroxisome proliferator-activated receptor- β/δ (PPAR β/δ)
Genovese, Salvatore; Foreman, Jennifer E.; Borland, Michael G.; Epifano, Francesco; Gonzalez, Frank J.; Curini, Massimo; Peters, Jeffrey M. *Life Sciences* (2010), 86(13-14), 493-498.
35. Composition and antioxidant activity of *Inula crithmoides* essential oil grown in central Italy (Marche region). Giamperi, Laura; Bucchini, Anahi; Fraternali, Daniele; Genovese, Salvatore; Curini, Massimo; Ricci, Donata. *Natural Product Communications* (2010), 5(2), 315-318.
36. Synthesis of 5-amino-1,10b-dihydro-2H-chromeno[3,4-c]pyridine-2,4(3H)-diones from coumarins and cyanoacetamides under basic conditions

Rosati, Ornelio; Curini, Massimo; Marcotullio, Maria Carla; Oball-Mond, Gildas; Pelucchini, Caroline; Procopio, Antonio

Synthesis (2010), (2), 239-248.

37. Natural coumarins as a novel class of neuroprotective agents

Epifano, Francesco; Curini, Massimo; Menghini, Luigi; Genovese, Salvatore

Mini-Reviews in Medicinal Chemistry (2009), 9(11), 1262-1271.

38. Colorectal cancer chemoprevention by 2 β -cyclodextrin inclusion compounds of auraptene and 4'-geranyloxyferulic acid

Tanaka, Takuji; de Azevedo, Mariangela B. M.; Duran, Nelson; Alderete, Joel B.; Epifano, Francesco; Genovese, Salvatore; Tanaka, Mayu; Tanaka, Takahiro; Curini, Massimo

International Journal of Cancer (2010), 126(4), 830-840.

39. Insights on novel biologically active natural products: 7-isopentenylcoumarin

Epifano, Francesco; Pelucchini, Caroline; Curini, Massimo; Genovese, Salvatore

Natural Product Communications (2009), 4(12), 1755-1760

40. Chemical composition of the essential oil of *Commiphora erythraea*

Marcotullio, Maria Carla; Santi, Claudio; Mwanjike, Gildas Norbert Oball-Mond; Curini, Massimo

Natural Product Communications (2009), 4(12), 1751-1754. Language: English, Database: CAPLUS

41. Composition and antioxidant activity of *Nepeta foliosa* essential oil from Sardinia (Italy)

Giamperi, Laura; Bucchini, Anahi; Cara, Pierpaolo; Fraternali, Daniele; Ricci, Donata; Genovese, Salvatore; Curini, Massimo; Epifano, Francesco

Chemistry of Natural Compounds (2009), 45(4), 554-556

42. Prenylxyphenylpropanoids as a novel class of anticonvulsive agents

Genovese, Salvatore; Epifano, Francesco; Curini, Massimo; Dudra-Jastrzebska, Monika; Luszczki, Jarogniew J.

Bioorganic & Medicinal Chemistry Letters (2009), 19(18), 5419-5422.

43. Chemistry and biological activity of azoprenylated secondary metabolites

Genovese, Salvatore; Curini, Massimo; Epifano, Francesco

Phytochemistry (Elsevier) (2009), 70(9), 1082-1091.

44. Bioassay-oriented isolation of an insecticide from *Ailanthus altissima*

De Feo, Vincenzo; Mancini, Emilia; Voto, Emanuela; Curini, Massimo; Digilio, Maria Cristina

Journal of Plant Interactions (2009), 4(2), 119-123.

45. Boropinic acid, a novel inhibitor of *Helicobacter pylori* stomach colonization

Touati, Eliette; Michel, Valerie; Correia, Marta; Menghini, Luigi; Genovese, Salvatore; Curini, Massimo; Epifano, Francesco

Journal of Antimicrobial Chemotherapy (2009), 64(1), 210-211.

46. Preparation of triaryl- and triheteroarylmethanes under ytterbium triflate catalysis and solvent-free conditions

Genovese, Salvatore; Epifano, Francesco; Pelucchini, Caroline; Curini, Massimo

European Journal of Organic Chemistry (2009), (8), 1132-1135.

Comunicazioni a Congressi degli ultimi 5 anni:

1. L. Dominici, S. Maestri, M.C. Marcotullio, M. Villarini, L. Cossignani, R. Mammucari, M. Moretti.

Antigenotoxic properties of *Dendrobium speciosum* (Orchidaceae) extracts. 8th International Comet Assay Workshop. Perugia, 27-30 Agosto 2009.

2. M.C. Marcotullio, C. Santi, S. Genovese, M. Curini. Composition of the essential oils, supercritical CO₂ and hexane extracts of *Commiphora erythraea* (Ehnb) Engl.. ISEO 2009-40th International Symposium on Essential Oils. Savigliano (TO), 6-9 Settembre 2009.

3. M.C. Marcotullio, F. Messina, L. Giamperi, A. Bucchini, D. Ricci, M. Curini. Furanosesquiterpeni da *Commiphora erythraea* e loro attività biologica. FITOMED 2010-IV Congresso Intersocietà sulle Piante Medicinali. Cagliari, 23-26 Giugno 2010.

4. M.C. Marcotullio, F. Messina, E. Cenci, E. Rossi, F. Epifano, M. Curini. Frazionamento bioguidato e attività antivirale di furanosesquiterpeni da *Commiphora erythraea* (Ehnb) Engl. XIX Congresso Nazionale di Fitoterapia. Perugia, 27-29 Maggio 2011.

5. F. Messina, M.C. Marcotullio, M. Curini, M.R. Loizzo, R. Tundis, F. Menichini. Indagine fitochimica di estratti di *Euphrasia pectinata*. Congresso S.I.F. 2011. Roma, 30 Giugno-2 Luglio 2011.

6. O. Rosati, M. Curini, M.C. Marcotullio, F. Messina, C. Chiesi. Heterogeneous catalysis in the synthesis of tetrahydrocannabinol analogues. XXIV Congresso Nazionale della Società Chimica Italiana. Lecce, 11-16 Settembre 2011.

7. F. Messina, M.C. Marcotullio, M. Curini. La *Commiphora erythraea*: Profilo fitochimica e Biologico. XX Congresso Italo-Latinoamericano di Etnomedicina. Fortaleza- Ceara (Brasil)19-22 Settembre 2011.

8. F. Messina, M. Moretti, M. Villarini, L. Cossignani, L. Dominici, R. Mammucari, B. Tirillini, M.C. Marcotullio. Composition, antioxidant and antigenotoxic activities of *Dendrobium speciosum* extracts. "ChimAlSi 2012". IX Italian Congress of Food Chemistry. Ischia (NA), June 3-7 2012.

9. O. Rosati, F. Messina, M. Curini, M.C. Marcotullio. Improved microwavw assisted synthesis of tetrahydrocannabinol analogues catalyzed by Yb(OTf)₃. XXXIV Convegno Nazionale Divisione di Chimica Organica. Pavia, 10-14 Settembre 2012.

10. M.C. Marcotullio, F. Messina, O. Rosati, M. Curini. *C. erythraea*: ancient myth, modern uses. (Plenary su invito). XXI Congresso Italo-Latinoamericano di Etnomedicina. Paestum (SA), 25-29 Settembre 2012

11. F. Messina, M.C. Marcotullio, O. Rosati, A. Temperini, M.R. Loizzo, R. Tundis, F. Menichini. Phytochemical analysis and anticancer activity evaluation of *Euphrasia pectinata* Ten. XXI Congresso Italo-Latinoamericano di Etnomedicina. Paestum (SA), 25-29 Settembre 2012.

12. 84) S. Superchi, S. Santoro, F. Messina, E. Santoro, O. Rosati, C. Santi, M.C. Marcotullio. Stereochemical characterization of Agarsenone, a new cadinane sesquiterpenoid from *Commiphora erythraea*. 14th International Conference of Chiroptical Spectroscopy. Nashville (TN, USA) 9-13 Giugno 2013.
13. F. Messina, O. Rosati, M. Curini, M.C. Marcotullio, J. Gertsch, A. Chicca. Microwave assisted synthesis of tetrahydrocannabinol analogues catalyzed by Yb(OTf)₃ and their binding affinity at cannabinoid receptors. XV Convegno Nazionale sulle Reazioni Pericicliche e Sintesi di Etero e Carbocilci. Perugia, 28-29 Giugno 2013.
14. O. Rosati, M. Curini, M.C. Marcotullio, F. Messina, A. Pelosi. A multi-component synthesis of 2-amino-4H-chromenes mediated by α -Zr(KPO₄)₂. XXXV Convegno della Divisione di Chimica Organica. Sassari, 9-13 Settembre 2013.
15. F. Messina, M. Curini, M.C. Marcotullio, G. Cardinali, S. Sosa, R.E. Robles Zepeda. Phytochemical and biological evaluation of *Bursera mycrophylla* A. Gray extracts. XIII Congresso Nazionale della Società Italiana di Fitochimica. Gargnano (BS), 19-21 Settembre 2013.
16. F. Messina, O. Rosati, A. Pelosi, M. Curini, M.C. Marcotullio, J. Gertsch, A. Chicca. Δ^3 -THC and analogues: synthesis and profiling on the endocannabinoid system. XIII Congresso Nazionale della Società Italiana di Fitochimica. Gargnano (BS), 19-21 Settembre 2013.

Attività didattica a.a. 2013-2014: Chimica Organica-C.d.L Farmacia 9CFU

Organic Chemistry-Pharmacy-9CFU