

Prof Lorenzo Testaferri

A Tribute

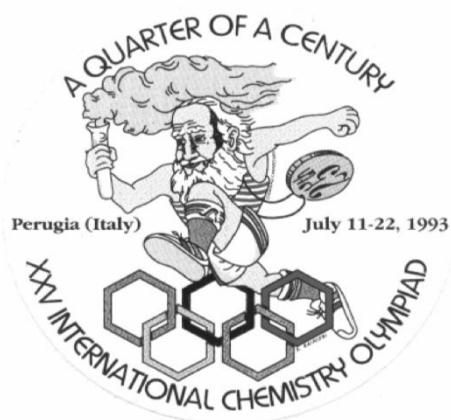


This special issue dedicated to Professor Lorenzo Testaferri to commemorate his 75th birthday and to acknowledge his contribution to Organic Chemistry as researcher and as teacher

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Lorenzo Testaferri was born in Chiaravalle (AN-Italy) on October 20, 1943. He studied chemistry at the University Alma Mater of Bologna where he graduated in 1970. After graduation, he carried out research in the Faculty of Chemistry at the same university before being appointed as Assistant Professor of Organic Chemistry at the University of Bari where he remained until 1978. In that year, he moved to the Faculty of Pharmacy at Perugia University where he taught "Physical Methods in Organic Chemistry" and "Organic Chemistry II". In 1993, he became full professor and Chair of Organic Chemistry working together with Prof. Marcello Tiecco. Throughout his entire career he undertook several responsible positions including president of the council for the libraries of chemical, pharmaceutical and biotechnological sciences, president of the local section of the Italian Chemical Society (1992-1995), director of the Institute of Organic Chemistry (1996-1999) and Head of the Department of Chemistry and Drug Technology (2000-2013). Prof. Testaferri always invested a great deal of effort into his didactic commitments. In addition to his expertise, his students appreciated his humanity and his passion for transmitting knowledge in the field of advanced organic chemistry. He retired in 2013 but continued to be a source of inspiration to all his former co-workers.

In 1993 he served as Co-Chairman for the organization of the "XXV International Chemistry Olympiad", a particularly important event because it celebrated a quarter of century of this worldwide appreciated meeting.



*The logo of the "XXV International Chemistry Olympiad" and
a moment of the closing ceremony with Prof. Testaferri on the right of the table*

Prof. Testaferri published more than 150 papers in renowned international journals and his research interests included structure and reactivity of organic free radicals, homolytic aromatic *ipso* substitution reactions, cross and homo coupling reactions, and new synthetic procedures promoted or catalysed by organoselenium compounds. His research at Perugia University began the study of nucleophilic aromatic substitution of non-activated substrates and metal-mediated coupling reactions and led in 1986 to the total synthesis of Orellanine, the cytotoxic toxin produced by the mushrooms *Cortinarius orellanus* and *Cortinarius rubellus* reported in Poland some years earlier to be responsible for severe poisoning.

In the field of organoselenium chemistry, he was particularly active in the use of electrophilic reagents for addition reactions and cyclofunctionalizations in the synthesis of heterocyclic compounds. The use of optically pure diselenides was shown to control the formation of new stereogenic centres in the synthesis of

optically enriched compounds. In the last period of his career, he was also involved in the development of novel, efficient, catalytic protocols promoted by organoselenium compounds using water as an economic and reusable reaction medium.

From a personal point of view and as a former student and co-worker of Prof. Testaferri, I take the opportunity to thank him, on behalf of all the organic chemists in my department for his teaching and enthusiasm for organic chemistry. Approaching the celebration of his 75th birthday we wish him, his family (his wife Aldina, his sons and grandchildren) all the best and we thank him sincerely for his scientific contributions and the strong human values that he promoted during his career and after his retirement. All of us consider him a mentor and co-worker, but most of all, a friend.

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Selected Publications

1. Testaferri, L.; Tiecco, M.; Zanirato, P. The Coupling of Thieno[3,2-b]thiophen-2-ones with Diazoalkanes *J. Org. Chem.* **1975**, 40 (23), 3392-3395.
<https://doi.org/10.1021/jo00911a018>
2. Testaferri, L.; Tiecco, M.; Spagnolo, P.; Zanirato, P.; Martelli, G. Structural effects on the reactivity of carbon radicals in homolytic aromatic substitutions. Part III.1 reaction of the 1-adamantyl radical with benzene derivatives *J. Chem. Soc., Perkin Trans 2* **1975**, (6), 662-668.
<https://doi.org/10.1039/p29760000662>
3. Testaferri, L.; Tiecco, M.; Zanirato, P.; Martelli, G. Preparation and Tautomeric Structures of Some Potential 2,5-Dihydroxythieno[3,2-b]thiophenes *J. Org. Chem.* **1978**, 43 (11), 2197-2200.
<https://doi.org/10.1021/jo00405a024>
4. Testaferri, L.; Tiecco, M.; Tingoli, M.; Fiorentino, M.; Troisi, L. Radical alkyldenitration. A synthetically useful example of homolytic aromatic ipso-substitution reactions *J. Chem. Soc. Chem. Commun.* **1978**, (3), 93-94.
<https://doi.org/10.1039/c39780000093>
5. Testaferri, L.; Tiecco, M.; Tingoli, M. Radical adamantyldenitration in polynitrobenzenes. Selectivity of homolytic aromatic ipso substitution *J. Chem. Soc., Perkin Trans 2* **1978**, (4), 469-474.
<https://doi.org/10.1039/p29790000469>
6. Testaferri, L.; Tingoli, M.; Tiecco, M. A convenient synthesis of aromatic thiols from unactivated aryl halides *Tetrahedron Lett.* **1980**, 21 (32), 3099-3100.
[https://doi.org/10.1016/S0040-4039\(00\)77418-1](https://doi.org/10.1016/S0040-4039(00)77418-1)
7. Testaferri, L.; Tingoli, M.; Tiecco, M. Reactions of Polychlorobenzenes with Alkanethiol Anions in HMPA. A Simple, High-Yield Synthesis of Poly(alkylthio)benzenes *J. Org. Chem.* **1980**, 45 (22), 4376-4380.
<https://doi.org/10.1021/jo01310a022>
8. Testaferri, L.; Tiecco, M.; Tingoli, M.; Chianelli, D.; Montanucci, M. Selective dealkylations of aryl alkyl ethers and thioethers by sodium in HMPA *Tetrahedron* **1982**, 38 (24), 3687-3692.

9. Testaferri, L.; Tiecco, M.; Tingoli, M.; Chianelli, D.; Maiolo, F. Selective cleavage of the carbon-sulphur and carbon-oxygen bonds in methoxythioanisoles *Tetrahedron* **1982**, *38* (17), 2721-2724.
[https://doi.org/10.1016/0040-4020\(82\)80028-8](https://doi.org/10.1016/0040-4020(82)80028-8)
10. Testaferri, L.; Tingoli, M.; Tiecco, M. The unusual behaviour of nitro-substituted radical σ-complexes. The reactions of alkyl radicals with 9-nitroanthracene *J. Chem. Soc., Perkin Trans 2* **1982**, (5), 543-546.
<https://doi.org/10.1039/P29830000543>
11. Testaferri, L.; Tiecco, M.; Tingoli, M.; Chianelli, D. Nucleophilic vinylic substitutions on unactivated substrates. The behaviour of styryl alkyl sulphides and selenides towards sulphur and selenium nucleophiles. *Tetrahedron* **1985**, *41* (7), 1401-1408.
[https://doi.org/10.1016/S0040-4020\(01\)96542-1](https://doi.org/10.1016/S0040-4020(01)96542-1)
12. Testaferri, L; Tiecco, M.; Tingoli, M.; Bartoli, D.; Massoli, A. The reactions of some halogenated pyridines with methoxide and methanethiolate ions in dimethylformamide *Tetrahedron* **1985** *41* (7), 1373-1384.
[https://doi.org/10.1016/S0040-4020\(01\)96539-1](https://doi.org/10.1016/S0040-4020(01)96539-1)
13. Testaferri, L.; Tiecco, M.; Tingoli, M.; Chianelli, D. Stereospecific synthesis of divinyl diselenides from vinyl acetyl selenides *Tetrahedron* **1986**, *42* (16), 4577-4584.
[https://doi.org/10.1016/S0040-4020\(01\)87301-4](https://doi.org/10.1016/S0040-4020(01)87301-4)
14. Testaferri, L.; Tiecco, M.; Tingoli, M., Chianelli, D. Stereospecific synthesis of divinyl selenides nucleophilic substitutions of unactivated vinyl halides by vinyl selenide anions *Tetrahedron* **1986**, *42* (1), 63-69.
[https://doi.org/10.1016/S0040-4020\(01\)87402-0](https://doi.org/10.1016/S0040-4020(01)87402-0)
15. Tiecco, M.; Tingoli, M.; Testaferri, L.; Chianelli, D.; Wenkert, E. Total synthesis of orellanine. The lethal toxin of *Cortinarius Orellanus* fries mushroom *Tetrahedron* **1986**, *42* (5), 1475-1485.
[https://doi.org/10.1016/S0040-4020\(01\)87367-1](https://doi.org/10.1016/S0040-4020(01)87367-1)
16. Tiecco, M.; Testaferri, L.; Tingoli, M.; Bartoli, D.; Balducci, R. Ring-Closure Reactions Initiated by the Peroxydisulfate Ion Oxidation of Diphenyl Diselenide *J. Org. Chem.* **1990**, *55* (2), 429-434.
<https://doi.org/10.1021/jo00289a010>
17. Tiecco, M.; Testaferri, L.; Tingoli, M.; Bartoli, D.; Marini, F. Selenium-promoted conversion of β-diketones and β-keto esters into α,α-dimethoxy β-diketones and α,α-dimethoxy β-keto esters *J. Org. Chem.* **1991**, *56* (17), 5207-5210.
<https://doi.org/10.1021/jo00017a039>
18. Tiecco, M.; Testaferri, L.; Tingoli, M.; Marini, F. Elimination reactions of terminal β-oxy selenoxides. Synthesis of aryl and vinyl enol ethers and of furans, oxazoles, and thiazoles *J. Org. Chem.* **1993**, *58* (6), 1349-1354.
<https://doi.org/10.1021/jo00058a011>
19. Tiecco, M.; Testaferri, L.; Tingoli, M.; Bagnoli, L.; Marini, F. Ring-closure reactions of alkenyl oximes induced by persulfate anion oxidation of diphenyl diselenide. Formation of 1,2-oxazines and cyclic nitrones *J. Chem. Soc., Perkin Trans 1* **1993**, (17), 1989-1993.
<https://doi.org/10.1039/p19930001989>
20. Tiecco, M.; Testaferri, L.; Tingoli, M.; Bagnoli, L.; Santi, C. Catalytic conversion of (β,γ-unsaturated esters, amides and nitriles into γ-alkoxy or γ-hydroxy α,β-unsaturated derivatives induced by persulfate anion oxidation of diphenyl diselenide *J. Chem. Soc. Chem. Commun.* **1993**, (7), pp. 637-639.
<https://doi.org/10.1039/C39930000637>
21. Tiecco, M.; Testaferri, L.; Tingoli, M.; Marini, F. N-hydroxy γ-lactams or cyclic N-hydroxy imidates from the organoselenium-induced cyclization of β,γ-unsaturated hydroxamic acids *J. Chem. Soc. Chem. Commun.* **1994**, (2), 221-222.

- <https://doi.org/10.1039/C39940000221>
22. Tiecco, M.; Testaferri, L.; Tingoli, M.; Bagnoli, L. Organoselenium-induced stereoselective cyclisation of O-allyl oximes: A new synthetic route to isoxazolidines *J. Chem. Soc. Chem. Commun.* **1995**, (2), pp. 235-236.
<https://doi.org/10.1039/c39950000235>
23. Tiecco, M.; Testaferri, L.; Tingoli, M.; Marini, F. 1,4,2-Dioxazines or N-acyl isoxazolidines from organoselenium-induced cyclisation of O-allyl hydroxamic acids *J. Chem. Soc. Chem. Commun.* **1995**, (2), 237-238.
<https://doi.org/10.1039/c39950000237>
24. Tiecco, M.; Testaferri, L.; Bagnoli, L. Alkenyl nitrones cyclizations induced by phenylselenenyl bromide. A convenient synthetic route to 1,2-oxazines *Tetrahedron* **1996**, 52 (19), 6811-6822.
[https://doi.org/10.1016/0040-4020\(96\)00293-1](https://doi.org/10.1016/0040-4020(96)00293-1)
25. Tiecco, M.; Testaferri, L.; Marini, F. Stereoselective organoselenium-induced cyclization of N-allyl acethydrazides to 1,3,4-oxadiazines or N-acetyl pyrazolidines *Tetrahedron* **1996**, 52 (36), 11841-11848.
[https://doi.org/10.1016/0040-4020\(96\)00675-8](https://doi.org/10.1016/0040-4020(96)00675-8)
26. Tiecco, M.; Testaferri, L.; Santi, C. Catalytic oxyselenenylation-deselenenylation reactions of alkenes - Stereoselective one-pot conversion of 3-alkenols into 2,5-dihydrofurans *Eur. J. Org. Chem.* **1999**, (4), 797-803.
[https://doi.org/10.1002/\(SICI\)1099-0690\(199904\)1999:4<797::AID-EJOC797>3.0.CO;2-O](https://doi.org/10.1002/(SICI)1099-0690(199904)1999:4<797::AID-EJOC797>3.0.CO;2-O)
27. Tiecco, M.; Testaferri, L.; Santi, C.; Tomassini, C.; Marini, F.; Bagnoli, L.; Temperini, A. Preparation of a new chiral non-racemic sulfur-containing diselenide and applications in asymmetric synthesis *Chem-Eur. J.* **2002**, 8 (5), 1118-1124.
[https://doi.org/10.1002/1521-3765\(20020301\)8:5<1118::AID-CHEM1118>3.0.CO;2-2](https://doi.org/10.1002/1521-3765(20020301)8:5<1118::AID-CHEM1118>3.0.CO;2-2)
28. Tiecco, M.; Testaferri, L.; Santi, C.; Tomassini, C.; Marini, F.; Bagnoli, L.; Temperini, A. Asymmetric azidoselenenylation of alkenes: A key step for the synthesis of enantiomerically enriched nitrogen-containing compounds *Angew. Chem. Int. Edit.* **2003**, 42 (27), 3131-3133.
<https://doi.org/10.1002/anie.200351229>
29. Tiecco, M.; Testaferri, L.; Santi, C.; Tomassini, C.; Bonini, R.; Marini, F.; Bagnoli, L.; Temperini, A. A chiral electrophilic selenium reagent to promote the kinetic resolution of racemic allylic alcohols *Org. Lett.* **2004**, 6 (25), 4751-4753.
<https://doi.org/10.1021/o1048001+>
30. Tiecco, M.; Testaferri, L.; Bagnoli, L.; Marini, F.; Santi, C.; Temperini, A.; Scarponi, C.; Sternativo, S.; Terlizzi, R.; Tomassini, C. Enantioselective synthesis of heterocyclic compounds mediated by organoselenium reagents *Arkivoc* **2006**, 2006 (7), 186-206.
<https://doi.org/10.3998/ark.5550190.0007.715>
31. Tiecco, M.; Testaferri, L.; Santi, C.; Tomassini, C.; Santoro, S.; Marini, F.; Bagnoli, L.; Temperini, A.; Costantino, F. Intramolecular nonbonding interactions between selenium and sulfur - Spectroscopic evidence and importance in asymmetric synthesis *Eur. J. Org. Chem.* **2006**, (21), 4867-4873.
<https://doi.org/10.1002/ejoc.200600517>
32. Santoro, S.; Santi, C.; Sabatini, M.; Testaferri, L.; Tiecco, M. Eco-friendly olefin dihydroxylation catalyzed by diphenyl diselenide *Adv. Synth. Catal.* **2008**, 350 (18), 2881-2884.
<https://doi.org/10.1002/adsc.200800571>

33. Marini, F.; Sternativo, S.; Del Verme, F.; Testaferri, L.; Tiecco, M. Enantioselective organocatalytic Michael addition of α -substituted cyanoacetates to α,β -unsaturated selenones *Adv. Synth. Catal.* **2009**, 351 (1-2), 103-106.
<https://doi.org/10.1002/adsc.200800592>
34. Santoro, S.; Battistelli, B.; Testaferri, L.; Tiecco, M.; Santi, C. Vinylic substitutions promoted by PhSeZnCl: Synthetic and theoretical investigations *Eur. J. Org. Chem.* **2009**, (29), pp. 4921-4925.
<https://doi.org/10.1002/ejoc.200900800>
35. Bagnoli, L.; Scarponi, C.; Rossi, M.G.; Testaferri, L.; Tiecco, M. Synthesis of enantiopure 1,4-dioxanes, morpholines, and piperazines from the reaction of chiral 1,2-diols, amino alcohols, and diamines with vinyl selenones *Chem-Eur. J.* **2011**, 17 (3), 993-999.
<https://doi.org/10.1002/chem.201002593>
36. Sternativo, S.; Calandriello, A.; Costantino, F.; Testaferri, L.; Tiecco, M.; Marini, F. A highly enantioselective one-pot synthesis of spirolactones by an organocatalyzed michael addition/cyclization sequence *Angew. Chem. Int. Edit.* **2011**, 50 (40), 9382-9385.
<https://doi.org/10.1002/anie.201104819>
37. Santi, C.; Battistelli, B.; Testaferri, L.; Tiecco, M. On water preparation of phenylselenoesters *Green Chem.* **2012**, 14 (5), 1277-1280.
<https://doi.org/10.1039/c2gc16541d>
38. Bagnoli, L.; Casini, S.; Marini, F.; Santi, C.; Testaferri, L. Vinyl selenones: Annulation agents for the synthesis of six-membered benzo-1,4-heterocyclic compounds *Tetrahedron* **2013**, 69 (2), 481-486.
<https://doi.org/10.1016/j.tet.2012.11.036>
39. Sternativo, S.; Battistelli, B.; Bagnoli, L.; Santi, C.; Testaferri, L.; Marini, F. Synthesis of γ -lactams via a domino Michael addition/cyclization reaction of vinyl selenone with substituted amides *Tetrahedron Lett.* **2013**, 54 (49), 6755-6757.
<https://doi.org/10.1016/j.tetlet.2013.10.004>