

Prof. Massimo Crimi - 2025
- Scientific career -

- 1985: Degree in Biological Sciences with 110 points out of 110 with honors.
- 1986: Qualification to the profession of Biologist
- 1991: PhD degree in Cellular Biology and Biochemistry
- 1991: Member of the National Order of Biologists.
- 1993: Scholarship for the Project of the CNR "Biotechnology and Biostrumentation"
- 1993 - 1996: Three-year scholarship within the European Community research project entitled "Structure and Function of Photosynthetic Membrane H + ATPases".
- 1996: Researcher in Plant Physiology, University of Verona, Faculty of Sciences.
- 2000: Confirmation in the role of Researcher.
- 2006: Associate Professor in Plant Physiology, University of Verona.
- 2010: Confirmation in the role of Associate Professor.

Past Institutional roles:

- Member of the Academic Senate for the Faculty of Sciences (6 years)
- Member of the Permanent Research Commission of the Academic Senate (3 years)
- Member of the Permanent Commission for Didactics of the Academic Senate (3 years)
- President of the Course in Biotechnology (2012 - 2014)
- Commission for Disability, Faculty of Sciences
- Supervisor for the Didactics of the Science and Engineering Area (2014 - 2016)

Current Institutional roles:

- President Biotechnology Course (2021- today)
- Supervisor of the PLS Biotechnology National Scientific Project for the University of Verona (since 2016)
- Contact person for student Orientation at Biotechnology Courses
- Member of the University Commission for student Orientation

Number of international publications, average IF, citations and h-index

- 40 articles in international journals (1985 – today);
- o Average Impact Factor (calculated on 23 publications): 4.01
- o Average Impact Factor from 1985 to date: 3.92
- o Citations > 2500
- o h-index: 22

Publications

1. **"Studies on the mechanism of proton translocation in the mitochondrial bc₁ complex"**
G. Lenaz, M. Degli Esposti, M. Crimi, J.B. Saus, P. Svoboda e J. Timoneda (1985) in "Water and ions in biological systems" (A. Pullman, V. Vasilescu and L. Packer Eds.) 271-280, University of Bucarest, Romania.
2. **"Studies on the binding of dicyclohexylcarbodiimide to the mitochondrial bc₁ complex"**
M. Degli Esposti, M. Crimi, G. Lenaz, J. Timoneda, T. Barber, J. Cabo Soler e J.B. Saus (1986), *Bioelectrochemistry and Bioenergetics*, **16**, 301-316.
3. **"Resolution of the circular dichroism spectra of the mitochondrial cytochrome bc₁ complex"**
M. Degli Esposti, M. Crimi, C.M. Samworth, G. Solaini e G. Lenaz (1987) *Biochimica Biophysica Acta*, **892**, 245-252.
4. **"The circular dichroism properties of the Rieske protein and the b and c cytochromes of the mitochondrial bc₁ complex"**
G. Solaini, M. Crimi, F. Ballester, M. Degli Esposti and G. Lenaz in "Cytochrome Systems: Molecular Biology and Bioenergetics" (1987) (S. Papa, B. Chance and L. Ernster Eds.) pp. 337-338, Plenum Press, New York.
5. **"New approaches to the prediction of the folding of membrane proteins with redox function"**
M. Degli Esposti, A. Ghelli, R. Luchetti, M. Crimi e G. Lenaz (1989) *It. Journal of Biochemistry*, **38**, 1-22.
6. **"The membrane proteins that interact with quinones have common structural features"**
M. Degli Esposti e M. Crimi (1990) in "Highlights in Ubiquinone Research" (Lenaz, G. et al. eds) pp. 166-169, Taylor & Francis, London.
7. **"A critical evaluation of the hydropathy profile of membrane proteins"**
M. Degli Esposti, M. Crimi e G. Venturoli (1990) *Eur. J. Biochem.* **190**, 207-219
8. **"The oxidation of ubiquinol by the isolated "Rieske" iron-sulphur protein in solution"**
M. Degli Esposti, F. Ballester, J. Timoneda, M. Crimi e G. Lenaz, (1990) *Archives Biochem. Biophys.* **283**, 258-265.
9. **"The structure of the dihaem cytochrome *b* of fumarate reductase in *Wolinella Succinogenes*: circular dichroism and sequence analysis studies"**
M. Degli Esposti, M. Crimi, C. Kortner, A. Kroger e T. Link (1991) *Biochim. Biophys. Acta* **1056**, 243-249.
10. **"Structural predictions for membrane proteins: the dilemma of hydrophobicity scales"**
M. Crimi e M. Degli Esposti (1991) *Trends Biochem. Sci.* **16**, 119.
11. **"Structure/function relationships in mitochondrial cytochrome *b* revealed by the kinetic and circular dichroic properties of two yeast inhibitor-resistant mutants"**
T. Tron, M. Crimi, A.M. Colson e M. Degli Esposti (1991) *Eur. J. Biochem.* **199**, 753-760.
12. **"Human skeletal muscle: participation of different metabolic activities in oxidation of L-lactate"**
J. Popinigis, J. Antosiewicz, M. Crimi, G. Lenaz e T. Wakabayashi (1991) *Acta Biochimica Polonica* **38**, 169-175.
13. **"Cytochrome *b* of fish mitochondria is strongly resistant to funiculosin, a powerful inhibitor of respiration"**
M. Degli Esposti, A. Ghelli, M. Crimi, A. Baracca, G. Solaini, T. Tron e A. Meyer (1992) *Arch. Biochem. Biophys.* **295**, 198-204.
14. **"Cytochrome *b* of protozoan mitochondria: relationships between function and structure"**

- A. Ghelli, M. Crimi, S. Orsini, L. Gradoni, M. Zannotti, G. Lenaz e M. Degli Esposti (1992) *Comp. Biochem. Physiol.* **103B**, 329-338..
15. **"Mitochondrial cytochrome b: evolution and structure of the protein"**
M. Degli Esposti, S. DeVries, M. Crimi, A. Ghelli, T. Patarnello e A. Meyer (1993) *Biochim. Biophys. Acta* **1143**, 243-271.
 16. **"Complex I and Complex III of mitochondria have common inhibitors acting as ubiquinone antagonists"**
M. Degli Esposti, A. Ghelli, M. Crimi, E. Estornell, R. Fato, e G. Lenaz (1993) *Biochem. Biophys. Res. Commun.* **190**, 1090-1096.
 17. **"Natural variation in the potency and binding sites of mitochondrial quinone-like inhibitors"**
M. Degli Esposti, M. Crimi e A. Ghelli (1994) *Biochem. Soc. Trans.* **22**, 209-213.
 18. **"Functional alterations of the mitochondrially encoded ND4 subunit associated with Leber's hereditary optic neuropathy"**
M. Degli Esposti, V. Carelli, A. Ghelli, M. Ratta, M. Crimi, S. Sangiorgi, P. Montagna, G. Lenaz, E. Lugaresi e P. Cortelli (1994) *FEBS Letters* **352**, 375-379..
 19. **"Functional alteration of mitochondrial complex I in affected and nonaffected individuals with 11778/ND4 Leber's hereditary optic neuropathy (LHON)"**
V. Carelli, A. Ghelli, S. Sangiorgi, M. Ratta, F. Sparla, S. Capellari, P. Cortelli P. Montagna, M. Crimi, E. Lugaresi e M. Degli Esposti (1995) *Neurology* **45**, suppl. 4, A245.
 20. **"Unreliability of carotenoid electrochromism for the measure of electrical potential differences induced by ATP hydrolysis in bacterial chromatophores"**
M. Crimi, V. Fregni, A. Altimari e B.A. Melandri (1995) *FEBS Letters* **367**, 167-172.
 21. **"The driving force for the activation of the F-ATPase in chromatophores is not correctly estimated by the carotenoid electrochromic response"**
M. Crimi, V. Fregni, A. Altimari e B.A. Melandri (1995) in "Photosynthesis: from Light to Biosphere" **Volume III** (P. Mathis ed.) pp. 171-174, Kluwer Academic Publishers, Netherlands.
 22. **"Human skeletal muscle mitochondria in aging: lack of detectable morphological and enzymatic defects"**
C. Zucchini, A. Pugnali, F. Pallotti, R. Solmi, M. Crimi, C. Castaldini, G. Biagini e G. Lenaz (1995) *Biochemistry and Molecular Biology International*, vol. **37**, 4, 607-616.
 23. **"The ATP Synthase *atpHAGDC* (F₁) Operon from *Rhodobacter capsulatus*"**
R. Borghese, M. Crimi, L. Fava and B.A. Melandri (1998) *J. Bacteriol.* **180**, 416-421.
 24. **"Higher plants light harvesting proteins. Structure and function as revealed by mutation analysis of either protein or chromophore moieties"**
D. Sandonà, R. Croce, A. Pagano, M. Crimi and R. Bassi (1998) *Biochim. Biophys Acta* **1365**, 207-214.
 25. **"Zeaxanthin-induced fluorescence quenching in the minor antenna CP29"**
M. Crimi, D. Dorra, C.S. Börsinger, E. Giuffra, R. Bassi, and A.R. Holzwarth (1998) in "Photosynthesis: Mechanisms and Effects" Volume I (G. Garab ed.), Kluwer Academic Publishers, Netherlands, 333-336.
 26. **"Mutation analysis of either protein or chromophore moieties in Higher Plants Light Harvesting Proteins"**
M. Crimi, R. Croce, D. Sandonà, C. Varotto, R. Simonetto and R. Bassi (1998) in "Photosynthesis: Mechanisms and Effects" Volume I (G. Garab ed.), Kluwer Academic Publishers, Netherlands, 253-258.
 27. **"Orientation of Chlorophyll Transition Moments in the Higher-Plant Light Harvesting Complex CP29"**
R. Simonetto, M. Crimi, D. Sandonà, R. Croce, G. Cinque, Jacques Breton and R. Bassi (1999) *Biochemistry*, **38**:40, 12974-83.

28. **"Calcium binding to the photosystem II subunit CP29"**
C. Jegerschöld, A.W.Rutherford, T.A. Mattioli, M. Crimi and R. Bassi (2000) *J. Biol. Chem.*, 275, 17, 12781-12788.
29. **"Time-resolved fluorescence analysis of the recombinant Photosystem II antenna complex CP29. Effects of zeaxanthin, pH and phosphorylation"**
M. Crimi, D. Dorra, C. Boesinger, E. Giuffra, R. Bassi and A. Holzwarth (2001) *Eur. J. Biochem.*, 268, 260-267.
30. **"The photochemical behavior of xanthophylls in the recombinant photosystem II antenna complex CP26"**
H.A. Frank, S.K. Das, J.A. Bautista, D. Gosztola, G.P. Wiederrecht, D.Bruce, S. Vasil'ev, M. Crimi, R. Croce and R. Bassi (2001) *Biochemistry*, 40, 1220-1225.
31. **"Biochemical properties of the PsbS subunit of photosystem II either purified from chloroplast or recombinant "**
P. Dominici, S. Caffarri, F. Armenante, S. Ceoldo, M. Crimi, and R. Bassi (2002) *J. Biol. Chem.*, 277, 22750-22758.
32. **"Pro-apoptotic effect of a plant lipid transfer protein on mammalian mitochondria"**
M. Crimi, A. Astegno, G. Zoccatelli and M. Degli Esposti (2006) *Archives Biochem. Biophys.*, 445, 65–71.
33. **"Auxin and nitric oxide control indeterminate nodule formation"**
Y. Pii, M. Crimi, G. Cremonese, A. Spena and T. Pandolfini (2007) *BMC Plant Biology*, 7:21.
34. **"Insight into the apoptosis-inducing action of α -bisabolol towards malignant tumour cells: involvement of lipid rafts and Bid"**
E. Darra, S. Abdel-Azeim, A. Manara, K. Shoji, J.D. Maréchal, S. Mariotto, E. Cavalieri, L. Perbellini, C. Pizza, D. Perahia, M. Crimi and H. Suzuki (2008) *Archives Biochem. Biophys.*, 476(2):113-23 .
35. **"Bid binding to negatively charged phospholipids may not be required for its pro-apoptotic activity in vivo"**
A. Manara, J. Lindsay, M. Marchioretto, A. Astegno, A.P.Gilmore, M. Degli Esposti and M. Crimi (2009) *Biochim. Biophys. Acta - Molecular and Cell Biology of Lipids*, 1791, 997-1010.
36. **"The Medicago truncatula N5 gene encoding a root-specific lipid transfer protein, is required for the symbiotic interaction with Sinorhizobium meliloti"**
Y. Pii, A. Astegno, E. Peroni, M. Zaccardelli, T. Pandolfini and M. Crimi (2009) *Molecular Plant Microbe Interactions*, 22, 1577-1587.
37. **"Signaling LTPs: A new plant LTPs sub-family?"**
Y. Pii, T. Pandolfini and M. Crimi (2010), *Plant Signal. Behav.* 5, 594-597.
38. **"Apoptosis-induced changes in mitochondrial lipids"**
M. Crimi and M. Degli Esposti (2011) *Biochim. Biophys. Acta - Molecular Cell Research*, 1813, 551-557.
39. **"Plants expressing murine pro-apoptotic protein Bid do not have enhanced PCD"**
A. Manara , Z. Imanifard, L. Fracasso, D. Bellin and M. Crimi (2020) *BMC Research Notes*, 13:450.
40. **"Bioprospecting of Artemisia genus: from artemisinin to other potentially bioactive compounds"**
S. Negri; F. Pietrolucci; S. Andreatta; R. Chinyere Njoku; C. Antunes Silva Nogueira Ramos; M. Crimi; M. Commisso; F. Guzzo and L. Avesani (2023) *Natural Products and Bioprospecting*, submitted.

Other scientific publications (meetings and other activities)

- Youri Pii, Giorgia Cremonese, Massimo Crimi, Angelo Spena, Tiziana Pandolfini, “Nodulation of determinate and indeterminate legumes by Rhizobia expressing an auxin-synthesising chimeric operon” (2006) Congresso FISV, 8th Annual Meeting, Riva del Garda (TN), Italy, 28 September - 1 October 2006.
- Alessandra Astegno, Youri Pii, Elisa Peroni, Tiziana Pandolfini and Massimo Crimi “Functional Characterization of a new Lipid Transfer Protein With Antimicrobial Properties From *Medicago truncatula*” (2006) Congresso FISV, 8th Annual Meeting, Riva del Garda (TN), Italy, 28 September - 1 October 2006.
- Anna Manara, Alessandra Astegno, Mauro Degli Esposti and Massimo Crimi “Analysis of the lipid binding properties of mutant murine Bid proteins” (2007) FISV 2007, IX Annual Congress – Riva del Garda 26-29 Settembre 2007.
- Youri Pii, Alessandra Astegno, Elisa Peroni, Tiziana Pandolfini and Massimo Crimi “Studies on the role played by MtN5, a root-specific LTP from *Medicago truncatula* expressed during Rhizobia infection” (2007) XIII IS-MPMI, Sorrento, 21-27 Luglio 2007.
- Youri Pii, Alessandra Astegno, Elisa Peroni, Massimo Zaccardelli, Tiziana Pandolfini and Massimo Crimi (2008) “Does MtN5 play a double role in the root response to symbiotic and pathogenic microorganisms?” XLVII Congresso SIFV, Pisa, 30 Giugno - 2 Luglio 2008.
- Anna Manara, Barbara Sottocornola, Massimo Delledonne and Massimo Crimi (2009) “Does The Animal Proapoptotic Pathway Work in Plant Cells?” Primo Congresso della Società Italiana di Biologia Vegetale, 30 Giugno - 2 Luglio 2009, Verona, Italy.
- Massimo Crimi and Anna Manara (2014) “Expression of the animal pro-apoptotic protein Bid in *Arabidopsis thaliana*” XIII FISV CONGRESS 24-27 Settembre 2014, Pisa, Italy.
- Massimo Crimi, Anna Manara, Linda Fracasso, Zahra Imanifard and Diana Bellin (2016) “Bid in plants: Characterization of plant expressing the animal pro-apoptotic protein Bid” Plant Biology Europe – EPSO/FESPB 2’16 Congress, 26-30 Giugno 2016, Praga Repubblica Ceca.
- R. Vallone, C. Foresti, A. Regaiolo, T. Colombo, N. Vitulo, A. Astegno, V. Venturi, M. Crimi, A. Polverari and E. Vandelle “Biochemical and Functional Characterization of the Bacterial PsrI Sensor in the *Pseudomonas Syringae* PV. Actinidiae -Kiwifruit interaction” Proceedings of the Joint Congress SIBV-SIGA,– 19-22 September, 2017, Pisa, Italy.
- M. Crimi “Biotecnologie per il pianeta e per l’uomo. Come le biotecnologie possono aiutarci a risolvere problemi attuali” in “Strategie per lo sviluppo della qualità nella didattica universitaria”, p. 516-522. Volume a cura di M. Michelini e L. Perla, Congresso GEO–CRUI–ANVUR, 2024.

- **“Fisiologia Vegetale”** W. G. Hopkins & N. P. A. Hüner (2008) Prima edizione italiana (*McGraw-Hill ed.*).
- “Estrazione e Caratterizzazione di pigmenti fotosintetici in foglie di spinacio” M. Crimi (2006) in *“ESPERIENZE DI LABORATORIO PER LA DIDATTICA DEL SETTORE BIO/04”* a Cura di Giuseppe Forlani, (Società Italiana di Fisiologia Vegetale – Prima edizione) pp. 6-7.
- “Fotoprotezione e *fotobleaching* delle antenne del PSII” M. Crimi (2006) in *“ESPERIENZE DI LABORATORIO PER LA DIDATTICA DEL SETTORE BIO/04”* a Cura di Giuseppe Forlani, (Società Italiana di Fisiologia Vegetale – Prima edizione) pp. 14-15.
- “Analisi della composizione proteica delle membrane fotosintetiche durante l’inverdimento mediante tecniche elettroforetiche e di immunoblotting” M. Crimi (2006) in *“ESPERIENZE DI LABORATORIO PER LA DIDATTICA DEL SETTORE BIO/04”* a Cura di Giuseppe Forlani, (Società Italiana di Fisiologia Vegetale – Prima edizione) pp. 17-19.

Other scientific tributes

- The **Journal of Bioenergetics and Biomembranes**, volume 25 number 5, October 1993 (Plenum Press, New York and London) published on the cover the transmembrane model of a mitochondrial carrier elaborated by Dr. Massimo Crimi.
- The journal **Chemtracts - Biochemistry and Molecular Biology** (1991) 2, 66-69 selected the article "A Critical Evaluation of the Hydropathy Profile of Membrane Proteins" M. Degli Esposti, M. Crimi and G. Venturoli (1990) *Eur. J. Biochem.* 190, 207-219 and published an account of the research presented.
- The textbook **"Molecular Cell Biology"** Lodish, H., Baltimore, D., Berk, A., Zipursky, S.L., Matsudaira, P. and Darnell, J. cites in the bibliography of Chapter 17 on p. 776 for the topic "Electron Transport Chain in Mitochondria" the review "Mitochondrial Cytochrome b: evolution and structure of the protein" M. Degli Esposti, S. DeVries, M. Crimi, A. Ghelli, T. Patarnello and A. Meyer (1993) *Biochim. Biophys. Acta* 1143, 243-271.
- The book "Bioenergetics at a glance" Harris, D.A. Blackwell Science, University of Oxford, cites in the bibliography "Mitochondrial Cytochrome b: evolution and structure of the protein" M. Degli Esposti, S. DeVries, M. Crimi, A. Ghelli, T. Patarnello and A. Meyer (1993) *Biochim. Biophys. Acta* 1143, 243-271.