

Curriculum vitae

Marco Fondi – University of Florence - Dep. of Biology

Personal information

Name and Surname: Marco Fondi

Born in Pistoia, Italy, 9 Settembre 1980

Home address: Via di Scandicci Alto 33, 50018 Scandicci (FI)



Current Affiliation

Department of Biology, University of Florence, Via Madonna del Piano 6, 50019 Sesto F.no, Firenze Italy

Present position: Research Fellow, tenure-track researcher (RTD-A)

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Education and positions:

October 2017 – present, Tenure-track Researcher, Dep. of Biology, University of Florence, Italy. Coordinator of PNRA Project PNRAB04.2 “Exploiting Antarctica biotechnological potential: metabolic modelling for optimization of bioactive molecules biosynthesis from Antarctic bacteria”

April 2014 – September 2017, Post-doc at the Dep. of Biology, University of Florence, Italy. Coordinator of PNRA Project PNRAB04.2 “Exploiting Antarctica biotechnological potential: metabolic modelling for optimization of bioactive molecules biosynthesis from Antarctic bacteria”

June 2012 – January 2014, FEMS research fellow, Computer Lab Cambridge University, UK (Supervisor: Prof. Pietro Liò).

January 2012 – June 2012, Visiting post-doc at the Bioinformatics and Molecular Evolution Unit, Department of Biology, National University of Ireland Maynooth, Ireland (Supervisor: Prof. James McInerney).

January 2011 – December 2011, Research Fellow (supported by Fondazione Adriano Buzzati Traverso), Dep. Of Biology, University of Florence, Italy

March 2010-December 2010, Post-doc at the Dep. Of Biology, University of Florence, Italy

2007-2009, PhD student at at the Dep. Of Biology, University of Florence, Italy. Area of the PhD program: Genetics, Microbiology and Bioinformatics

2006-20017: Research Fellow (supported by PNRA, Piano Nazionale di Ricerca in Antartide), Dep. Of Biology, University of Florence, Italy

2000-2005, Master degree in Biology, University of Florence

Research activity

Most relevant publications (2007-present)

- Elena Perrin, Veronica Ghini, Michele Giovannini, Francesca Di Patti, Barbara Cardazzo, Lisa Carraro, Camilla Fagorzi, Paola Turano, Renato Fani, **Marco Fondi**. Diauxie and co-utilization of carbon sources can coexist during bacterial growth in nutritionally complex environments. **Nature Communications**. 2020;11(1):3135. Published 2020 Jun 19. doi:10.1038/s41467-020-16872-8
- George C diCenzo, Michelangelo Tesi, Thomas Pfau, Alessio Mengoni, and **Marco Fondi**. Genome-scale metabolic reconstruction of the symbiosis between a leguminous plant and a nitrogen-fixing bacterium. **Nature Communications**. 2020;11(1):3135. Published 2020 Jun 19. doi:10.1038/s41467-020-16872-8.
- Lind AL, Lai YYY, Mostovoy Y, Holloway AK, Iannucci A, Mak ACY, **Fondi M**, Orlandini V, Eckalbar WL, Milan M, Rovatsos M, Kichigin IG, Makunin AI, Johnson Pokorná M, Altmanová M, Trifonov VA, Schijlen E, Kratochvíl L, Fani R, Velenský P, Reháč I, Patarnello T, Jessop TS, Hicks JW, Ryder OA, Mendelson JR 3rd, Ciofi C, Kwok PY, Pollard KS, Bruneau BG. Genome of the Komodo dragon reveals adaptations in the cardiovascular and chemosensory systems of monitor lizards. **Nat Ecol Evol**. 2019 Aug;3(8):1241-1252. doi: 10.1038/s41559-019-0945-8. Epub 2019 Jul 29. PMID: 31358948; PMCID: PMC6668926.
- **Fondi M**, Di Patti F, A synthetic ecosystem for the multi-level modelling of heterotroph-phototroph metabolic interactions, **Ecological modelling**, Accepted for publication
- diCenzo G, Mengoni A, **Fondi M**. Tn-Core: a toolbox for integrating Tn-seq gene essentiality data and constraint-based metabolic modelling. **ACS Synth Biol**. 2018 Dec 7. doi: 10.1021/acssynbio.8b00432. PubMed PMID:30525460.
- diCenzo GC, Benedict AB, **Fondi M**, Walker GC, Finan TM, Mengoni A, Griffiths JS. Robustness encoded across essential and accessory replicons of the ecologically versatile bacterium *Sinorhizobium meliloti*. **PLoS Genet**. 2018 Apr 19;14(4):e1007357. doi: 10.1371/journal.pgen.1007357. eCollection 2018 Apr. PubMed PMID: 29672509.
- diCenzo GC, Checucci A, Bazzicalupo M, Mengoni A, Viti C, Dziewit L, Finan TM, Galardini M, **Fondi M**. (2016) Metabolic modelling reveals the specialization of secondary replicons for niche adaptation in *Sinorhizobium meliloti*. *Nat Commun*. 2016 Jul 22;7:12219.
- **M Fondi**, A Karkman, M Tamminen, E Bosi, M Virta, R Fani, E Alm, and JO McInerney, Every gene is everywhere but the environment selects: Global geo-localization of gene sharing in environmental samples through network analysis **Genome Biol Evol** first published online April 29, 2016doi:10.1093/gbe/evw077
- **Fondi M**, Maida I, Perrin E, Orlandini V, La Torre L, Bosi E, Negroni A, Zanaroli G, Fava F, Decorosi F, Giovannetti L, Viti C, Vaneeschoutte M, Dijkshoorn L, Fani R. Genomic and phenotypic characterization of the species *Acinetobacter venetianus*. **Sci Rep**. 2016 Feb 23;6:21985. doi: 10.1038/srep21985. PubMed PMID: 26902269; PubMed Central PMCID: PMC4763211.
- Bosi E, Monk JM, Aziz RK, **Fondi M**, Nizet V, Palsson BØ. (2016) Comparative genome-scale modelling of *Staphylococcus aureus* strains identifies strain-specific metabolic capabilities linked to pathogenicity. **Proc Natl Acad Sci U S A**. Jun 28;113(26):E3801-9.
- **Fondi M**, Maida I, Perrin E, Mellera A, Mocali S, Parrilli E, Tutino ML, Liò P, Fani R. Genome-scale metabolic reconstruction and constraint-based modelling of the Antarctic bacterium *Pseudoalteromonas*

haloplanktis TAC125. **Environ Microbiol.** 2015 Mar;17(3):751-66. doi: 10.1111/1462-2920.12513. Epub 2014 Jun 30. PubMed PMID: 24889559.

- **Fondi M**, Liò P. Multi -omics and metabolic modelling pipelines: challenges and tools for systems microbiology. **Microbiol Res.** 2015 Feb;171:52-64. doi: 10.1016/j.micres.2015.01.003. Epub 2015 Jan 7. Review. PubMed PMID: 25644953.
- Tamminen M, Virta M, Fani R, **Fondi M**. Large-scale analysis of plasmid relationships through gene-sharing networks. **Mol Biol Evol.** 2012 Apr;29(4):1225-40. doi: 10.1093/molbev/msr292. Epub 2011 Nov 29. PubMed PMID: 22130968.
- **Fondi M**, Fani R. The horizontal flow of the plasmid resistome: clues from inter-generic similarity networks. **Environ Microbiol.** 2010 Dec;12(12):3228-42. doi: 10.1111/j.1462-2920.2010.02295.x. PubMed PMID: 20636373.

Full list at: <https://scholar.google.com/citations?user=R7cSmlIAAAAJ&hl=en>

Fellowships and Grants

2012 - FEMS Advanced Research Fellowship 2012, on Genome-scale functional modelling of Antarctic bacteria: biotechnological potentials of extreme environment adapted metabolism. Supervisor: Prof. Pietro Liò, Computer Lab, University of Cambridge UK.

2012 - Short Term Travel Fellowship, Science Foundation of Ireland Incoming STTF Programme, in collaboration with the Bioinformatics and Molecular Evolution Unit, Department of Biology, National University of Ireland Maynooth, Ireland.

2013 – PNRA project B04.2 call 2013. Project tile: Exploiting Antarctica biotechnological potential: metabolic modelling for optimization of bioactive molecules biosynthesis from Antarctic bacteria. **Financing Institution:** Ministero dell'Istruzione, dell'Università e della Ricerca, Programma Nazionale di Ricerche in Antartide, Call 2013. Budget: 90.000 €

2016 – PNRA PNRA16_00246 1/06/2018-1/06/2020

Future microbial communities: predicting the impact of global climate changes on aquatic microbial communities through guided evolution and multi-omics integration. **Financing Institution:** Ministero dell'Istruzione, dell'Università e della Ricerca (MIUR), Programma Nazionale di Ricerche in Antartide, Call 2016. Budget: 76.800 €

Visiting scientist periods

1. **November 22 – December 22/2008:** Visiting student at BMGE, **Institut Pasteur (Paris, France)**. Supervisor: Dr. Simonetta Gribaldo.
2. **April 6-13/2010–:** Visiting student at ITB-CNR Milan, Italy. Supervisor: Dr. Gianluca De Bellis
3. **October 31- November 5/2010–:** Visiting researcher at University of Helsinki, Department of Applied Chemistry and Microbiology, Division of Microbiology. Supervisor: Prof Marko Virta.
4. **January/2012 – June/2012.** Visiting post-doc at the Bioinformatics and Molecular Evolution Unit, Department of Biology, National University of Ireland Maynooth, Ireland (Supervisor: Prof. James McInerney).

Societies

- Member of the Italian Society of Evolutionary Biology (SIBE).
- Member of the Italian Society of Bioinformatics (BITS).
- Member of the Italian Society of General Microbiology and Microbial Biotechnologies (SIMGBM).

Awards

1. **SIMGBM- Franco Tatò Prize 2010** for the best PhD thesis in General Microbiology.
2. **Young Scientist Grant** (sponsored by **FEMS** and **ESCMID**) for *Acinetobacter 2010*, 8th International Symposium on the Biology of Acinetobacter Rome 1 – 3 Settembre 2010
3. **Firenze University Press 2010 prize, for the best PhD thesis in the Scientific Area**
5. **Young Scientist Grant** (sponsored by **FEMS** and **ESCMID**) for Marine Microbiology & Biotechnology: Biodiscovery, Biodiversity and Bioremediation 2012 , Cork (Ireland) 14-17 Novembre 2012
6. **Young Scientist Grant** (sponsored by **FEMS**) for FEMS2013, Liepzig (Germany) 21-25 Luglio 2013.

Communications to national and international meetings

1. **Fondi M**, Brilli M, Fani R (2005). **The “Common Pathway” and the evolution of metabolic routes** (7° FISV Meeting, Riva del Garda, Italy, 22-25 Settembre 2005).
2. **Fondi M**, Brilli M, Fani R. **On the origin and evolution of biosynthetic pathways: integrating microarray data with structure and organization of the Common Pathway genes**, Cortona Procarioti 2005, 31 Marzo- 2 Aprile.
3. **Fondi M**, Brilli M, Papaleo MC, Maida I, Bacci G, Emiliani G, Fani R **Mobilome: a comparative and evolutionary analysis**, Cortona Procarioti 2008, 14-15/03/2008.
4. **Marco Fondi**, Maria Cristiana Papaleo, Luigi Michaud, Angelina Lo Giudice, Vivia Bruni and Renato Fani, **Genome adaptation to Extreme Environments**, I meeting of the Italian Astrobiology Society Cortona (Arezzo, Italy) 29-30 May 2008.
5. **Marco Fondi**, **The ancestral metabolism: origin and evolution of metabolic pathways**. 28° meeting della Società Italiana di Microbiologia Generale e Biotecnologie Microbiche (SIMGBM), Spoleto 11-13 Giugno 2009.
6. **M. Fondi**, M. C. Papaleo, A. Mengoni, I. Maida, E. Perrin, M. Vaneechoutte, L. Dijkshoorn and R. Fani. **Exploring the evolutionary dynamics of plasmids: the *Acinetobacter pan-plasmidome***. *Acinetobacter 2010*, 8th International Symposium on the Biology of Acinetobacter Rome 1 – 3 September 2010
7. **Marco Fondi**, Isabel Maida, Elena Perrin, Maria Cristiana Papaleo and Renato Fani. **The Horizontal Flow of Plasmid Resistome: Clues from Similarity Networks Analysis**. **IBS 2010**, 4th International Biotechnology Symposium and Exhibition Biotechnology for the Sustainability of Human Society 14-18 September 2010, Palacongressi, Rimini Italy

8. **M. Fondi**, R. Fani, M. Virta, M. Tamminen **ANALYSIS OF PLASMIDS RELATIONSHIPS THROUGH GENE SHARING NETWORKS** 4th Congress of European Microbiologists, FEMS 25-30 June 2011, Geneva, Swiss.
9. **M. Fondi**, **Comparative Genomics of *Acinetobacter venetianus* strains: Insights into hydrocarbon degradation**. Marine Microbiology & Biotechnology: Biodiscovery, Biodiversity and Bioremediation 2012 , Cork, Ireland, 14-17 November 2012
10. **M. Fondi**, G. Emiliani, V. Orlandini, L. Berna, K. Mara, E. Rizzi, G. Corti, M.C. Papaleo, L. . Dijkshoorn, E. Perrin, I. Maida, M. Vaneechoutte, G. DeBellis, R. Fani, "**The *Acinetobacter venetianus* pan-genome: clues on microbial hydrocarbon degradation**" Acinetobacter 2013, 9th International Symposium on the Biology of Acinetobacter, Cologne, Germany, June 19-21 2013
11. **M. Fondi**, R. Fani, P. Liò, "**Comparative genomics to improve bacterial metabolic networks reconstruction and functional modelling**", FEMS 2013, 5th Congress of European Microbiologist, Leipzig , Germany, July 21-25 2013
12. **Fondi M. Genome-scale metabolic network reconstruction**, Training School/Workshop: "Bioinformatics approaches to adaptations, genome evolution and biological associations", Computer Laboratory, University of Cambridge, 23th-27th March 2015
13. **M. Fondi**, Metabolic modeling and multi-omics integration: new opportunities for environmental and clinical microbiology, **Scientific Spring Meeting KNVM & NVMM 2015**, Papendal Hotel en Conference Centre Papendallaan 3, 6816 VD Arnhem, The Netherlands
14. **M. Fondi**, Systems (micro)biology, Canazei Winter school on "Applied Bioinformatics". Alba di Canazei, Italy, 21-25 January, 2018.
15. Elena Perrin, Paola Turano, Veronica Ghini, Michele Giovannini, Barbara Cardazzo, Lisa Carraro, Ermenegilda Parrilli, Maria Luisa Tutino, Renato Fani, **Marco Fondi**. The multi-level relationship between heterotrophic bacteria and nutrients, XXXIII SIMGBM Congress Microbiology 2019, Florence, June 19-22, 2019
16. Elena Perrin, Paola Turano, Veronica Ghini, Michele Giovannini, Barbara Cardazzo, Lisa Carraro, Ermenegilda Parrilli, Maria Luisa Tutino, Renato Fani, **Marco Fondi**. 8th FEMS congress, Glasgow, Scotland, 7-11 July 2019

Florence, 25 Sep. 2020