

Curriculum vitae

Donatella de Pascale

Personal information

Nationality: Italian

Date and place of birth: 7 August 1967, Naples (Italy)

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Work address: IBP-CNR, Via Pietro Castellino 111, I-80131, Naples, Italy.

Education

- 2008-present** **Staff Researcher (Ricercatore III fascia), Group Leader**
Institute of Protein Biochemistry Naples, Italy
- 2001-2007.** **Post-doc position at the IBP-CNR** in the framework of the PNRA project
“BRUNI XO”.
- 2000.** **PhD in Design and Application of New Molecules of Biotechnological Interest.** Second University of Naples (SUN).
- 1996.** **Degree at the Specialisation School on Biotechnological Applications,**
with 50/50 *cum laude*. University of Naples “Federico II”.
- 1992.** **Master Degree in Biological Sciences,** with 110/110 *cum laude* with a
dissertation in Molecular Biology, University of Naples “Federico II”.
- 1986-1992.** **Student in Biological Sciences.**
University of Naples “Federico II”, Naples, Italy.

Project evaluation

- 2014.** Independent **Expert** for **Bando MISE, Italian Minister of Economy.**
- 2014.** Independent **Expert in the H2020 Marie S Curie Individual fellowship** Env Panel, 27-31
October 2014, Bruxelles.
- 2014.** Independent **Expert** for the International Cooperation Programme (PCI) of the National
Commission for Scientific and Technological Research of the Government of Chile (**CONICYT**).
- 2014.** Independent **Expert** for the Biotechnology and Biological Sciences Research Council
(**BBSRC**).

2013. Independent **Expert** for the South African Medical Research Council (**MRC**) in the call of South African Medical Research Council for 2013 African Traditional Medicine and Drug Discovery.

2013. Independent **Expert** in the **FP7 EU Marie Curie Actions** Evaluation, 6-11 October 2013, Bruxelles.

2013. Member of the Advisory Board in the CNR Technology Transfer Project: **BIOTTASA-**Department of Biomedicine, CNR, Italy.

2012. Miur (Italian Minister of University and Research) of independent **Expert** in the “FIRB giovani 2011” call.

Projects, Awards and other professional merits

2014. Coordinator of the **PNRA 2014-2016** (National Programme of Antarctic Research) project: Genome scanning and characterization of novel antifreeze proteins for industrial application.

2014. Team leader within **PNRA 2014-2016** project: Sea-ice associated methylated osmolytes: biogenesis and contribution to oceanic methane production (SIAMO).

2014. Team leader within **PNRA 2014-2016** project: New drugs for Cystic Fibrosis opportunistic pathogens from Antarctic microorganisms.

2014. Team leader within **PNRA 2014-2016** project: Exploiting Antarctica biotechnological potential: metabolic modelling for optimization of bioactive molecules biosynthesis from Antarctic bacteria.

2012-2016. Team Leader (Partner 11) in the **FP7 EU** Project entitled **PharmaSea** in the **KBBE.2012.3.2-01**: Innovative marine biodiscovery pipelines for novel industrial products.

2011. Visiting scientist in the laboratory of Prof. Yanfen Xue, at the Institute of Microbiology, Chinese Academy of Science, Beijing, China.

2011-2013. Project leader of the Cooperation agreement between National Research Council (CNR) and Chinese Academy of Science (CAS) **2011-2013**, entitled: Discovery of new extremozymes for biotechnological applications”.

2010. Visiting scientist in the laboratory of Prof. Bjarne Landfald at the Norwegian College of Fishery Science, University of Tromsø, Tromsø, Norway.

2009-2011. Team leader within **PNRA 2009-2011** <PROP09_47> research project: “Omics approaches to unravel biodiversity and evolution of polar microorganisms in view of climate changes and future biotechnological applications.”

2005-2007. Team leader of the research group within **PNRA 2005-2007** <MICELI7> research project: “Genomics and Proteomics of the Antarctic ciliate *Euplotes focardii*.”

2004-2006. Team leader within **PNRA 2004-2006** <BRUNIXO> research project: “Antarctic bacteria and cyanobacteria: biodiversity and production of compounds to be potentially exploited in biotechnology.”

2004. Participant at XIX **PNRA 2004** Antarctic Expedition, Italian scientific expeditions of PNRA at Terra Nova Bay, Ross Sea, Antarctica. Participant at the “Victoria Land Transect Cruise” on board the R/V *Italica*.

2003. Participant in the TUNU-II International Programme Expedition in Arctic, on board of R/V *Jan Majen* in collaboration with the Norwegian College of Fishery Science, University of Tromsø, Tromsø, Norway.

2002-2003. Team leader within **PNRA 2002-2003** <BRUNIXO> research project entitled: “Bacteria from Antarctica environment diversity and possible applications.”

2002. Participant in the TUNU-I International Programme expedition in Arctic, on board of R/V *Jan Majen* in collaboration with the Norwegian College of Fishery Science, University of Tromsø, Tromsø, Norway.

1997. Visiting scientist in the laboratory of Prof. R. Ladenstein at the Karolinska Institutet of Stockholm, Sweden.

Research Interests

Bioprospecting: Exploration of biodiversity for scientific and biotechnological applications.

1. The research activity is mostly focused on **the discovery of new bioactive compounds from Antarctic and Arctic bacteria**. These bacteria represent an untapped reservoir of biodiversity, and only few studies have been performed on the antimicrobial activity of isolates from Antarctic soils, seawater and sediments.

Some Antarctic strains have been proved to display (although to different extents) an antimicrobial activity against *Burkholderia cepacia* complex (Bcc) bacteria, a wide group of opportunistic pathogens that can colonize the lung of Cystic Fibrosis (CF) patients. The inhibitory activity very likely relies on the production of microbial Volatile Organic Compounds (mVOCs) by Antarctic bacteria. The research activity is aimed at the identification and purification of the bioactive compounds from these Antarctic strains.

2. Another aim is focused on the **dissection of the virulence and pathogenicity determinants of human pathogens** by using non-vertebrate host model, like *Caenorhabditis elegans*.

Finding novel virulence factors of these pathogens results in the identification of novel gene or target to use to fight the infection of these hazardous pathogens.

Bcc strains are able to kill *C. elegans* and the *C. elegans*-Bcc interaction is the subject of intensive investigation in our lab. The *C. elegans* system model can also be exploited for the discovery and validation of new bioactive antimicrobial compounds. *C. elegans* may be also used as model system in the anti-helminthic drugs discovery. In fact, *C. elegans* is sensitive to the majority of anthelmintic drugs that are used against parasitic worm infections of humans and livestock.

3. Other research activities are devoted to collect, analyse and describe the microbial biodiversity coming from cold biotopes. Our studies are focused on Antarctic psychrophilic microorganisms, with potential biotechnological applications. The molecular cold adaptation of enzymes involved in the lipid metabolism and proteases, are investigated and microorganisms are screened for the production of esterase/lipase and protease activities by Metagenomics approach.

Metagenomics library construction is aimed at unveiling the biodiversity in the Polar Regions and also at discovering new enzymes and bioactive compounds selected at low temperatures.

Most relevant peer-reviewed publications

1. Maida I, Bosi E, Fondi M, Perrin E, Orlandini V, Papaleo MC, Mengoni A, de Pascale D, Tutino ML, Michaud L, Lo Giudice A and Fani R. Antimicrobial activity of *Pseudoalteromonas* strains isolated from the Ross Sea (Antarctica) vs Cystic Fibrosis opportunistic pathogens. *Hydrobiologia*, accepted for publication 2015.

2. Barone R, De Santi C, Palma Esposito F, Tedesco P, Galati F, Visone M, Di Scala A, **de Pascale D**. Marine metagenomics, a valuable tool for enzymes and bioactive compounds discovery. *Front. Mar. Sci.*, 04 September 2014 | doi: 10.3389/fmars.2014.00038

3. Tedesco P, Visone M, Parrilli E, Tutino ML, Perrin E, Maida I, Fani R, Tegos G and **de Pascale D**. 2014 Analysis of virulence factors of *Burkholderia cepacia* complex strains in the *Caenorhabditis elegans* host model *J Biotechnol Biomater* 2014, 3:5, 219-220.

4. **de Pascale D**. Exploiting the cold environments: Psychrophilic bacteria as a promising source of novel bioactive compounds. *Journal of Biotechnology and Biomaterials* 2014, 3:108-109.

5. F Buonocore, E Randelli, P Trisolino, A Facchiano, **D de Pascale**, G Scapigliati. Molecular characterization and antibacterial activity of a g-type lysozyme from the european sea bass (*Dicentrarchus labrax*). *Molecular Immunology*, 2014, 62: 10-18.

6. De Santi C, Tedesco P, Ambrosino L, Altermark B, Willassen NP, **de Pascale D**.

A New Alkaliphilic Cold-Active Esterase from the Psychrophilic Marine Bacterium *Rhodococcus* sp.: Functional and Structural Studies and Biotechnological Potential. *Appl Biochem Biotechnol*. 2014 Mar 172(6): 3054-3068.

7. Fondi M, Orlandini V, Perrin E, Maida I, Bosi E, Papaleo MC, Michaud L, Lo Giudice A, **de Pascale D**, Tutino ML, Liò P, Fani R. Draft genomes of three Antarctic *Psychrobacter* strains producing antimicrobial compounds against *Burkholderia cepacia* complex, opportunistic human pathogens. *Mar Genomics*. 2014 Feb 13:37-38
8. I Maida, M Fondi, MC Papaleo, E Perrin, V Orlandini, G Emiliani, **D de Pascale**, E Parrilli, ML Tutino, L Michaud, A Lo Giudice, R Romoli, G Bartolucci, R Fani. Phenotypic and genomic characterization of the Antarctic bacterium *Gillisia* sp. CAL575, a producer of antimicrobial compounds. *Extremophiles* 2014, Jan, 18(1):35-49
9. V. Orlandini, I. Maida, M Fondi, E Perrin, MC Papaleo, E Bosi, **D. de Pascale**, ML Tutino, L Michaud, A Lo Giudice, R Fani. Genomic analysis of three sponge-associated *Arthrobacter* Antarctic strains, inhibiting the growth of *Burkholderia cepacia* complex bacteria by synthesizing volatile organic compounds. *Microbiology Research* 2014, Jun-Aug 169(7-8) 35-49.
10. G. Yang, C. De Santi, D. de Pascale, S. Pucciarelli, S Pucciarelli, C Miceli Structural/functional characterization of the first eukaryotic cold-adapted patatin-like phospholipase from the psychrophilic Antarctic protozoan *Euplotes focardii*: identification of putative determinants of thermal-adaptation. *Biochimie* 2013, Sep;95(9):1795-806.
11. R Romoli, MC Papaleo, **D de Pascale**, ML Tutino, L Michaud, A Lo Giudice, R Fani, G Bartolucci. GC-MS Volatolomic Approach to Study the Antimicrobial Activity of the Antarctic Bacterium *Pseudoalteromonas* sp.TB41. *Metabolomics*. 2013 vol. 10, pp. 42-51, ISSN:1573-3882.
12. Papaleo MC, Romoli R, Bartolucci G, Maida I, Perrin E, Fondi M, Orlandini V, Mengoni A, Emiliani G, Tutino ML, Parrilli E, **de Pascale D**, Michaud L, Lo Giudice A, Fani R. Bioactive volatile organic compounds from Antarctic (sponges) bacteria. *New Biotechnology* 2013 Apr 22. doi:pii: S1871-6784(13)00044-7. 10.1016/j.nbt.2013.03.011.
13. **de Pascale D**, De Santi C, Fu J, Landfald B. The microbial diversity of Polar environments is a fertile ground for bioprospecting. *Marine Genomics*. 2012 Dec; 8:15-22.
14. Fondi M, Orlandini V, Maida I, Perrin E, Papaleo MC, Emiliani G, **de Pascale D**, Parrilli E, Tutino ML, Michaud L, Lo Giudice A, Fani R. Draft Genome Sequence of the Volatile Organic Compound-Producing Antarctic Bacterium *Arthrobacter* sp. Strain TB23, Able To Inhibit Cystic Fibrosis Pathogens Belonging to the *Burkholderia cepacia* Complex. *Journal Bacteriology* 2012 Nov;194(22):6334-5.
15. Buonocore F, Randelli E, Casani D, Picchietti S, Belardinelli MC, **de Pascale D**, De Santi C, Scapigliati G. A piscidin-like antimicrobial peptide from the icefish *Chionodraco hamatus* (Perciformes: Channichthyidae): Molecular characterization, localization and bactericidal activity. *Fish Shellfish Immunol*. 2012 Nov;33(5):1183-91.

16. Fu J, Leiros HK, **de Pascale D**, Johnson KA, Blencke HM, Landfald B. Functional and structural studies of a novel cold-adapted esterase from an Arctic intertidal metagenomic library. *Appl Microbiol Biotechnol.* 2012 May;97(9):3965-78.
17. De Santi C, Durante L, Del Vecchio P, Parrilli E, Tutino ML and **de Pascale D**. Thermal stabilization of psychrophilic enzymes: a case study of the cold-active Hormone-Sensitive Lipase from *Psychrobacter* sp. TA144. *2012 Biotechnology Progress*, Jul; 28 (4):946-52
18. Ascione G, **de Pascale D**, De Santi C, Pedone C, Dathan NA, Monti SM. Native expression and purification of hormone-sensitive lipase from *Psychrobacter* sp. TA144 enhances protein stability and activity. *Biochem Biophys Res Commun.* 2012 420,542-6.
19. Mandrich L, De Santi C, **de Pascale D**, Manco G. Effect of low organic solvents concentration on the stability and catalytic activity of HSL-like carboxylesterases: Analysis from psychrophiles to (hyper)thermophiles. *2012 Journal Molecular Catalysis: B enzymatic*, in press
20. Romoli R, Papaleo MC, **de Pascale D**, Tutino ML, Michaud L, LoGiudice A, Fani R, Bartolucci G. Characterization of the volatile profile of Antarctic bacteria by using solid-phase microextraction-gas chromatography-mass spectrometry. *J Mass Spectrom.* 2011 46, 1051-9.
21. Mandrich L., and **de Pascale D**. An overview on thermal adaptation of esterases and lipases belonging to the HSL family: new insight on the computational analysis. *2011 Current Chemical Biology* 5, 17-28
22. Mandrich L. and **de Pascale D**. Microbial marine community as source of hydrolytic enzymes. Study on thermal adaptation of esterases and lipases from marine micro-organisms. 2011 on: *The marine environment: Ecology, Management and Conservation*. Editor Adam Nemeth, Nova Science Publishers.
23. De Santi C, Tutino ML, Mandrich L, Giuliani M, Parrilli E, Del Vecchio P, **de Pascale D**. The hormone-sensitive lipase from *Psychrobacter* sp. TA144: New insight in the structural/functional characterization. *2010 Biochimie.* Aug;92(8):949-57.
24. **D. de Pascale**, M. Giuliani, C. De Santi, N. Bergamasco, A. Amoresano, A. Carpentieri, E. Parrilli and M.L. Tutino. *PhAP* protease from *Pseudoalteromonas haloplanktis* TAC125: gene cloning, recombinant production in *E. coli* and enzyme characterization. *2010 Polar Science*, 4 285-294.
25. Tutino M.L., Parrilli E., De Santi C., Giuliani M., Marino G., **de Pascale D**. Cold-Adapted Esterases and Lipases: A Biodiversity Still Under-Exploited. *2010 Current Chemical Biology.* 4; 74-83.
26. Tutino ML, di Prisco G, Marino G, **de Pascale D**. Cold-adapted esterases and lipases: from fundamentals to application. *2009 Protein Pept Lett.* 16(10); 1172-1180.

27. **de Pascale D**, Cusano A M., Autore F, Parrilli E, di Prisco G, Marino G and Tutino M L. The cold-active Lip1 lipase from the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125 is a member of a new bacterial lipolytic enzyme family. 2008 *Extremophiles*. 12(3);311-23.
28. Marino K, Boschetto L, **de Pascale D**, Cocca E. Organisation of the Hb 1 genes of the Antarctic skate *Bathyraja eatonii*: New insights into the evolution of globin genes. 2007 *Gene*. 406;199-208.
29. Verde C, Balestrieri M, **de Pascale D**, Pagnozzi D, Lecointre G and di Prisco G The oxygen transport system in three species of the boreal fish family Gadidae. Molecular phylogeny of hemoglobin. 2006 *J Biol Chem*. 281; 22073-22084.
30. Lo Giudice A, Michaud L, **de Pascale D**, De Francesco M, di Prisco G, Fani R, Bruni V. Lipolytic activity of Antarctic marine cold-adapted bacteria (Terra Nova Bay, Ross Sea) 2006 *J Appl Microbiol*. 101; 1039-1048.
31. Verde C, De Rosa MC, Giordano D, Mosca D, **de Pascale D**, Raiola L, Cocca E, Carratore V, Giardina B and di Prisco G. Structure, function and molecular adaptations of haemoglobins of the polar cartilaginous fish *Bathyraja eatonii* and *Raja hyperborea*. 2005 *Biochem J*. 389; 297-306.
32. Verde C, Cocca E, **de Pascale D**, Parisi E, di Prisco G. Adaptation and life style in polar marine environments: a biological challenge for the study of fish evolution. 2004 *Polar Research*. 23; 3-10.
33. Verde C, Parisi E, **de Pascale D**, Riccio A, di Prisco G. The hemoglobin system of the Arctic spotted wolffish *Anarhichas minor*. Comparison of northern and southern polar marine environments. 2003 *Proceedings of the SCAR 8th Backhuys Publishers, Leiden, The Netherlands* 187-192.
34. **de Pascale D**, Di Lernia I, Sasso MP, Furia A, De Rosa M, Rossi M. A novel thermophilic chimera for trehalose production. 2002 *Extremophiles*. 6; 463-468.
35. **de Pascale D**, Di Lernia I, Sasso MP, Rossi M, De Rosa M. Cloning, high level expression in *E. coli*, and down-stream purification of trehalose forming enzymes from *Sulfolobus solfataricus* strain MT4. 2001 *The Journal of Molecular Catalysis B: Enzymatic*. 11; 777-786.
36. Bartolucci S, **de Pascale D**, Rossi M. The disulfure oxidoreductase protein from *Pyrococcus furiosus*. 2001 *Methods in Enzymology*. 334; 62-73.
37. Ren B, Tibellin G, **de Pascale D**, Rossi M, Bartolucci S, Ladenstein R. A protein disulfide oxidoreductase from the archeon *Pyrococcus furiosus* contains two thioredoxin fold units. 1998 *Nature Structural Biology*. 5; 602-611.
38. Ren B, Tibellin G, **de Pascale D**, Rossi M, Bartolucci S, Ladenstein R. Crystallization and preliminary X-Ray structure analysis of a hyperthermostable thioltransferase from the archaeon *Pyrococcus furiosus*. 1997 *Journal of Structural Biology*. 119; 1-5.
39. Bartolucci S, Guagliardi A, Pedone E, **de Pascale D**, Cannio R, Camardella L, Rossi M,

Nicastro G, de Chiara C, Facci P, Mascetti G, Nicolini C. Thioredoxin from *Bacillus acidocaldarius*: characterization, high-level expression in *E. coli* and molecular modelling. 1997 Biochem J. 328; 277-285.

40. Guagliardi A, **de Pascale D**, Cannio R, Nobile V, Rossi M, Bartolucci S. The purification, cloning, and high-level expression of a glutaredoxin-like protein from the hyperthermophilic archaeon *Pyrococcus furiosus*. 1995 J Biol Chem. 270; 470-478.

41. Cannio R, **de Pascale D**, Rossi M, Bartolucci S. Gene expression of a thermostable β -galactosidase in mammalian cells and its application in assays of eukaryotic promoter activity. 1994 Biotechnology and Applied Biochemistry 19; 233-244.

Naples, January 2015

Dr. Donatella de Pascale