

**Roberta Russo**

**Date and place of birth:**

**Home address:**

**Affiliation:** Scuola Internazionale Superiore di Studi Avanzati (SISSA) – International School for Advanced Studies, via Bonomea 265, 34136 Trieste, Italy

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**Academic research training and positions**

- **April 2013 to date.** Postdoctoral fellowship in Neurobiology, Scuola Internazionale Superiore di Studi Avanzati (SISSA), Trieste, Italy. Research project: “Role of Hemoglobin in neurodegenerative diseases”.
- **March 2011 to February 2013.** Postdoctoral fellowship, Institute of Protein Biochemistry (IBP), National Research Council (CNR), Naples, Italy. Research project: “Study of hemoproteins from marine polar organisms”. Funded by National Programme for Antarctic Research (PNRA).
- **September 2008 to February 2011:** Recipient of fellowship, IBP (CNR), Naples, Italy. Research project: “Structure and function of hemoglobins from the Antarctic psychrophilic bacterium *Pseudoalteromonas haloplanktis* TAC125 (*PhTAC125*)”. Funded by PNRA.
- **January 2009 to December 2012:** PhD in Chemical Sciences, University of Naples “Federico II”, Italy. PhD thesis: “Structure and function of hemoproteins from cold adapted organisms”. Tutor: Prof. Pompea Del Vecchio.
- **June 2008:** Degree in Chemistry, University of Naples “Federico II”, Italy. Thesis: “Structure and evolution of truncated haemoglobin “two on two” in the Antarctic psychrophilic bacterium *Pseudoalteromonas haloplanktis* TAC125”. Tutor: Prof. Giovanni Sannia.
- **1998:** Classical High School Degree.

**Other Experience and Professional Memberships**

- July 2012: Participant in “DOPAMINET Summer School”, SISSA - International School for Advanced Studies, Trieste, Italy.
- July 2012: Participant in the Summer School on “Molecular Biomedicine”, University of Udine, Italy.

- June 2012 – December 2012: Visiting Scientist at International School for Advanced Studies (SISSA), Italy, Laboratory of Molecular Neuroscience.
- December 2011 - January 2012: Participant of the XXVIIth Italian Antarctic Expedition, Mario Zucchelli Station, Baia Terra Nova. Project: PNRA 2010/A1.08 “Role of oxygen in the evolution-genes and proteins of marine polar organisms (ROSE)”
- October 2011: Selected speaker in “CAREX conference on Life in Extreme Environments”, Dublin, Ireland, on “Neuroglobin in the brain and retina of Antarctic notothenioid fishes”
- March 2011 - July 2011: Visiting Scientist at International School for Advanced Studies (SISSA), Italy, Laboratory of Molecular Neuroscience. Project: “Biochemical analysis and functional role of hemoglobin from mesencephalic dopaminergic neurons in Parkinson’s disease”
- June 2010: Selected participant in the CAREX FP7 (Coordination Action for Research Activities on Life in Extreme Environments) School 2010, University of Tuscia’s Alpine Study Centre Pieve Tesino, Italy
- March 2010: Recipient of a Short-Term Mobility 2010 scholarship of National Research Council (CNR)
- January 2010: Recipient of the Transfer of Knowledge Grants-2009, funded by CAREX FP7 .
- January 2010 – May 2010: Visiting Scientist at INSERM, Dept “Pathologie de la polymerisation des proteines substitut du sang- U779”, Le Kremlin Bicêtre, Paris, France. Project: “Kinetic properties of heme proteins of the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125”.
- January 2008: Selected participant in the XII School of Pure and Applied Biophysics, Venice, “The ever changing world of (hemo)globins”

### Research activity

- Biochemical analysis of the unexpected finding of hemoglobin expression in the brain. Acquisition of a strong expertise in manipulating SINEUPs molecules, a new class of long non-coding RNA that activate translation of their sense protein partners, with potential application as therapeutics in neurodegenerative diseases, by cellular and molecular biology techniques (DNA cloning, RACE PCR, Real-time RT-PCR, Western Blotting, Transfection, Retroviral Infection, Immunofluorescence, Immunohistochemistry).
- Structure, function and evolution of hemoglobins in polar fish and bacteria. Biochemical characterization by classical techniques (chromatography, electrophoresis, immunochemical techniques i.e. Western Blotting and ELISA, aminoacid sequencing, enzymatic and chemical modifications of proteins, biological assays). Measurements of oxygen affinity by diffusion chamber. Multiple sequence alignment by ClustalX and phylogenetic analysis of proteins by Neighbour Joining and Maximum Likelihood. Cloning, expression, purification and structural/functional characterization of: i) 2/2 hemoglobins and flavohemoglobins in the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125; ii) Antarctic fish neuroglobins. Techniques of molecular biology, real-time PCR. Spectroscopic characterization UV-Vis at atmospheric and high pressure, kinetic and thermodynamic characterization of protein-ligand interactions (laser flash photolysis and circular dichroism), dynamic light scattering.

- Her research on hemoglobins and other globins is the object of 16 peer-reviewed and invited reviews in international journals and more than 20 communications in international and national venues.

### Collaborations

Dr. Russo has been maintaining long-standing scientific collaborations with:

- Prof S Gustincich, SISSA - International School for Advanced Studies, Trieste, Italy, as demonstrated by a recent publication (15) and two manuscripts currently in preparation.
- Prof RK Poole, University of Sheffield, UK as demonstrated by a recent publication (16)
- Prof. P Ascenzi, University of Roma Tre, Rome, Italy as demonstrated by a recent publication (15)
- Prof M Marden and G Hui Bon Hoa, INSERM, Paris, France and their laboratory where Dr. Russo spent a period as visiting scientist, publications (11, 14)
- Prof D Estrin, University of Buenos Aires, Argentina and his laboratory, publications (9, 10)
- Prof G Smulevich, University of Florence, Italy, publications (9, 11)
- Prof L Mazarella and A Vergara, Univ Federico II Naples, Italy, publications (2, 6)
- Prof C-HC Cheng, University of Urbana, Urbana, USA, publication (10)

**Publication List**

1. Giordano, D., Parrilli, E., Dettai, A., **Russo, R.**, Barbiero, G., Marino, G., Lecointre, G., di Prisco, G., Tutino, L., Verde, C., (2007) "The truncated hemoglobins in the Antarctic psychrophilic bacterium *Pseudoalteromonas haloplanktis* TAC125" *Gene* 398: 69-77, ISSN: 0378-1119
2. Verde, C., Giordano, D., **Russo, R.**, Riccio, A., Vergara, A., Mazzarella, L., di Prisco, G., (2009) "Hemoproteins in the cold". *Mar Genomics* 2: 67-73, ISSN: 1874-7787
3. Parrilli, E., Giuliani, M., Giordano, D., **Russo, R.**, Marino, G., Verde, C., Tutino, M.L., (2010) "The role of a 2-on 2 haemoglobin in oxidative and nitrosative stress resistance of Antarctic *Pseudoalteromonas haloplanktis* TAC125" *Biochimie* 92: 1003-1009, ISSN: 0300-9084
4. Giordano, D., **Russo, R.**, Coppola, D., di Prisco, G., Verde, C. (2010) "Molecular adaptations in hemoglobins of notothenioid fishes" *J Fish Biol* 76: 301-318, ISSN: 0022-1112
5. **Russo, R.**, Riccio, A., di Prisco, G., Verde, C., Giordano, D. (2010) "Molecular adaptations in Antarctic fish and bacteria" *Polar Science* 4: 245-256, ISSN: 1873-9652
6. Coppola, D., Giordano, D., Vergara, A., Mazzarella, L., di Prisco, G., Verde, C., **Russo, R.** (2010) "The hemoglobins of sub-Antarctic notothenioid fishes" *Polar Science* 4: 295-308, ISSN: 1873-9652
7. **Russo, R.**, Giordano, D., Riccio, A., di Prisco, G., Verde, C. (2010) "Cold-adapted bacteria and the globin case study in the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125" *Mar Genomics* 3: 125-131, ISSN: 1874-7787
8. Verde, C., Giordano, D., **Russo, R.**, Riccio, A., Coppola, D., di Prisco, G. (2011) "Evolutionary adaptations in Antarctic fish: the oxygen-transport system" *Oecol Aust* 15: 40-50, ISSN: 2177-6199
9. Howes, B.D, Giordano, D., Boechi, L., **Russo, R.**, Mucciacciaro, S., Ciaccio, C., Sinibaldi, F., Fittipaldi, M., Martí, M.A., Estrin, D.A., di Prisco, G., Coletta, M., Verde, C., Smulevich, G. (2011) "The peculiar heme pocket of the 2/2 hemoglobin of cold adapted *Pseudoalteromonas haloplanktis* TAC125" *J Biol Inorg Biochem* 16: 299-311, ISSN: 0949-8257
10. Boron, I., **Russo, R.**, Boechi, L., Cheng, C.-H. C., di Prisco, G., Estrin, D.A., Verde, C., Nadra, A. D. (2011) "Structure and dynamics of Antarctic fish neuroglobin assessed by computer simulations" *IUBMB Life*, 63(3): 206-213
11. Giordano, D., **Russo, R.**, Ciaccio, C., Howes, B.D., di Prisco, G., Marden, M.C., Hui Bon Hoa, G., Smulevich, G., Coletta, M., Verde, C. (2011) "Ligand- and proton-linked conformational changes of the ferrous 2/2 hemoglobin of *Pseudoalteromonas haloplanktis* TAC125" *IUBMB Life*, 63: 566-73
12. Giordano, D., **Russo, R.**, di Prisco, G., Verde, C. (2012) "Molecular adaptations in Antarctic fish and marine microorganisms" *Mar Genomics* 6:1-6, ISSN: 1874-7787
13. Verde, C., di Prisco, G., Giordano, D., **Russo, R.**, Anderson, D., Cowan, D. (2012) "Antarctic psychrophiles: models for understanding the molecular basis of survival at low temperature and responses to climate change" *Biodiversity* 13: 249-256. ISSN: 1488-8386

14. **Russo, R.**, Giordano, D., di Prisco, G., Hui Bon Hoa, G., Marden, M.C., Verde, C., Kiger, L. (2013) "Ligand-rebinding kinetics of 2/2 hemoglobin from the Antarctic bacterium *Pseudoalteromonas haloplanktis* TAC125" *Biochim Biophys Acta* 1834(9):1932-8, ISSN: 0006-3002
15. **Russo, R.**, Zucchelli, S., Codrich, M., Marcuzzi, F., Verde, C. and Gustinich, S. (2013) "Hemoglobin is present as a canonical  $\alpha_2\beta_2$  tetramer in dopaminergic neurons" *Biochim Biophys Acta* 1834(9):1939-43, ISSN: 0006-3002
16. Giordano, D., Coppola, D., **Russo, R.**, Tinajero-Trejo, M., di Prisco, G., Lauro, F., Ascenzi, P., Verde, C. (2013) "The globins of cold-adapted *Pseudoalteromonas haloplanktis* TAC125: from the structure to the physiological functions" *Adv Microb Physiol* 63:329-89, ISSN: 0065-2911

#### Book chapters

1. di Prisco, G., Giordano, D., **Russo, R.**, Verde, C. (2011). Chapter on "Haemoglobin differentiation in fishes", on-line *Encyclopaedia of Fish Physiology*, From Genome to Environment (Tony Farrell Ed., Elsevier)
2. di Prisco, G., Giordano, D., **Russo, R.**, Verde, C. (2011). Chapter on "Erythropoiesis in fishes", on-line *Encyclopaedia of Fish Physiology*, From Genome to Environment (Tony Farrell Ed., Elsevier)
3. di Prisco, G., Giordano, D., **Russo, R.**, Verde, C. (2011) "Haemoproteins in cold environments-an evolutionary view", chapter 10 in the book "*Hemoglobin: Recent Developments and Topics*", edited by Masako Nagai
4. Verde, C., Giordano, D., **Russo, R.**, di Prisco, G. (2012) "The Adaptive evolution of polar fishes. Lesson from the function of hemoproteins. From Pole to Pole, Adaptation and evolution in marine environments". A book series on the scientific achievements of environmental research during the International Polar Year (IPY) vol. 1, p. 197-213, (di Prisco G, Verde C, Eds) ISBN/ISSN: 978-3-642-27351-3
5. di Prisco, G., Giordano, D., **Russo, R.**, Verde, C. (2012) "The challenges of low temperature in the evolution of bacteria. From Pole to Pole, Adaptation and evolution in marine environments". A book series on the scientific achievements of environmental research during the International Polar Year (IPY) vol. 1, p. 183-195, (di Prisco G, Verde C, Eds) ISBN/ISSN: 978-3-642-27351-3

#### Proceedings

1. Verde, C., Giordano, D., **Russo, R.**, di Prisco, G. (2011) "Antarctic climate change and the marine habitat", In "**Volume Mare, le attività di ricerca del CNR**" (Ed. CNR-DTA), Roma, Italia.

**Personal skills and competences**

Language:

Mother tongue: Italian;  
Other language: English

Computer skills and competences:

Good knowledge of Windows XP, Vista, Seven, Eight operating systems, MS-Office for Windows, graphic software (Paint Shop, Photoshop, Corel), analysis software (GraphPad), Internet Browsers. DNA analysis software. Good knowledge of computer networks

Driving licence:

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I authorise the treatment of my personal data according to the Italian law 196/2003.

Trieste, 11/03/2014

Signature

Dr. Roberta Russo

