


## PERSONAL INFORMATION

## Stefania Abbruzzetti

 Department of Mathematical, Physical and Computer Sciences, University of Parma, Parco Area delle Scienze 7A, Parma, 43124 Parma, Italy

 [stefania.abbruzzetti@unipr.it](mailto:stefania.abbruzzetti@unipr.it)

 <https://personale.unipr.it/it/uqovdocenti/person/19470>

## PERSONAL STATEMENT

During my PhD, I soon realized that my main interest was the understanding of the molecular mechanisms underlying the structural and functional dynamics of proteins. I also developed a strong interest in exploiting photoinduced processes in photosensitive molecules to develop experimental methodologies that could be useful for biophysical and technological applications. In recent years, I have approached studies in which **photophysics meets nanomedicine**, with the development of **theranostic systems for targeted photodynamic therapy**, a field that fulfils my aspiration to apply my biophysical background to the treatment of diseases. The main focus of my research activity is the use of light to initiate events that can be finely controlled, both spatially and temporally. In this activity, I have been assisted by my background in Physics, which allowed me to acquire a solid expertise in the application of time-resolved spectroscopic methods, also at the single-molecule level, to biological systems and photoactive molecules.

Overall, my primary interests can be divided into **four topics** **1)** developing methodologies based on nanosecond pulsed lasers and photoactivable molecules to investigate the dynamics of proteins and their structural changes; **2)** discovering and characterizing new fluorescent probes for in vivo applications **3)** understanding the structure-dynamics-functions relationship of heme-proteins; **4)** developing protein-based theranostic agents.

## Expertises

I have a consolidated expertise in laser flash photolysis, (to study transient species generated upon optical absorption) time correlated single photon counting (to determine the excited state dynamics through fluorescence decay measurements), fluorescence correlation spectroscopy (a single-molecule level technique to determine diffusion coefficient, the photophysics of fluorescent probe and the interaction between a fluorescent ligand and a molecule or a cell), photothermal methods, such as photoacoustics (to study energy and volume changes accompanying the reactions of the excited states), steady state spectroscopy (absorption and fluorescence).

The experience I have accumulated so far has taught me how to cope with experimental problems, to evaluate the information obtained through different experimental techniques, in particular time resolved methods, to interpret experiments, and model the observed physical processes using an original method that exploits a kinetics scheme to estimate microscopic rate constants of the different kinetic steps directly from the data.

## WORK EXPERIENCE

03/2015-present

## Associate Professor in Applied Physics

Department of Mathematical, Physical and Computer Sciences, University of Parma, Italy

▪ **Teaching activities:** General Physics, Molecular Biophysics, Introductory Biophysics. **Research activities on 4 topics** **1)** developing methodologies based on nanosecond pulsed lasers and photoactivable molecules to investigate the dynamics of protein structural changes; **2)** discovering and characterizing of new fluorescent probes for in vivo applications **3)** understanding the structure-dynamics-functions relationship in heme-proteins; **4)** developing protein-based theranostic agents (photodynamic therapy). **Management:** Chair of the Teaching Board of the Degree Course in Physics (from 2018) and the Manager for the Quality Assurance of the Bachelor Degree in Physics (from 2013).

**Sector** Molecular Biophysics

11/2011-03/2015

## Assistant Professor in Applied Physics

Department of Physics, University of Parma, Italy

- **Teaching activities:** Exercises of Physics, Laboratory of Biophysics, Data analysis. **Research activities on 3 topics** 1) developing methodologies based on nanosecond pulsed lasers and photoactivable molecules to investigate the dynamics of protein structural changes; 2) discovering and characterizing of new fluorescent probes for in vivo applications 3) understanding the structure-dynamics-functions relationship in heme-proteins.

02/2003-11/2011 **Sector** Molecular Biophysics  
**Post-doctoral**

Department of Physics, University of Parma, Italy

- **Research activities on 2 topics** 1) developing methodologies based on nanosecond pulsed lasers and photoactivable molecules to investigate the dynamics of protein structural changes; 2) understanding the structure-dynamics-functions relationship of heme-proteins.

11/2001-01/2003 **Sector** Molecular Biophysics  
**Permanent professorship in Maths and Science**

Secondary School, Piacenza, Italy

- **Teaching activities:** Maths and Sciences in a Secondary School (Maths. arithmetic, algebra, geometry, Sciences: basic elements of Biology, Chemistry and Physics).

**Sector** Maths and Natural Sciences

EDUCATION AND TRAINING

01/2002 **PhD in Physics, University of Parma**

Primary events in protein folding and conformational changes in proteins and model systems studied by fast techniques based on nanosecond pulsed lasers

- Time resolved photo-thermal methods, laser flash photolysis, optical spectroscopy, biophysics of proteins.

12/1998 **Master in Material Science and Technology, University of Parma**

50/50 cum laude

- Structural, optical and functional properties of materials, X-ray diffraction, semiconductors, magnetism and growth techniques for bulk crystals and thin films.

07/1995 **Laurea (B.S.) in Physics, University of Parma**

110/110 cum laude

- General Physics, practice in laboratory of Physics, quantum mechanics, physics of matter, analytical and statistical mechanics, chemistry, biophysics.

07/1990 **Diploma, Liceo Classico Statale M. Gioia, Piacenza**

60/60

- Latin, Greek, Italian, Maths, Physics, Science, Art-history, English, History, Philosophy.

PERSONAL SKILLS

Mother tongue Italian language

Other language(s)

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English	B1	B2	B1	B1
Replace with name of language certificate. Enter level if known.				

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user  
[Common European Framework of Reference for Languages](#)

Communication skills

- Very good constructive approach and communication skills gained through the experience as a university professor and as a teacher in secondary schools, and by organizing and participating to numerous scientific dissemination events
- excellent sense of adaptation gained through a long experience as post-doc researcher

Organisational / managerial skills

Deep experience accumulated as associate professor in organizing the work of people, in the area of teaching and supervising a degree course (schedules, timetables, courses, admission roles, evaluation of students problems, students careers, lecturers' evaluation,...)

- 2018- ▪ **Chair of the Teaching Board of the Degree Course in Physics** (responsible for a team of 5 people)
- 2013- ▪ **Manager for the Quality Assurance** of the Bachelor Degree in Physics. Under my chairmanship, in 2019 the Bachelor Degree in Physics received an excellent evaluation by means of the Italian National Agency for the Evaluation of Universities and Research Institutes (top A level), contributing to the outstanding results of the University of Parma (**level A, best grade in Italy**)

Job-related skills

Beside, a strong vocation to work in team and the deep experience accumulated as assistant supervisor of students and as researcher make me capable to:

- **plan independently** a concerted series of measurements aimed at the achievement of a target
- **coordinate people**
- **organize** the stages of a project,
- **gather up and summarize** the results.

As assistant and then associate professor at the University of Parma, I have mentored **27** Bachelor students (23 in Physics and 4 in Biology), **13** Master students (12 in Physics, and 1 in Biology) and I have co-supervised other **16** students. Moreover, I have been supervisor of 3 doctoral students (2014: dott. Alessandro Allegri; 2019: dott.ssa Chiara Montali, one at the present).

I have contributed to the final dissertation committee for 2 PhD students in Physics (2017 and 2020-President, Parma) and to the admission committee for the PhD course in Physics (2018 and 2020-President).

I have contributed as President to the committee for a post-doc position in Applied Physics (2021, Parma).

Digital skills

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient	Proficient	Proficient	Independent	Independent

Levels: Basic user - Independent user - Proficient user  
[Digital competences - Self-assessment grid](#)

- Excellent command of office suite (Word processor, Power Point, Excel)
- Very good command of Matlab gained as researcher in numerical analysis of experimental data
- Very good command of Origin gained as researcher in analysis of experimental data

ADDITIONAL INFORMATION



### Awards and Prizes

- 1996 ▪ Antonio Borsellino Award from the Italian Society of Pure and Applied Biophysics as the best thesis discussed in biophysics between 1994 and 1996 in Italy.
- 2002 ▪ Co-author of a paper that has been selected in the Highlights 2002 of the National Institute for the Physics of matter: Librizzi, F. et al. (Journal of Chemical Physics, 2002, 116, 3, 1193-1200).
- 2005 ▪ Co-author of a communication, which has been awarded as the best IICVCB2005 (International Interdisciplinary Conference on Vitamins, Coenzymes and Biofactors) poster presentation (Osaka, Japan): "*Catalytic mechanism of cysteine desulfhydrase from synechocystis: a pre-steady state kinetic study*".
- 2017 ▪ Author of an oral communication which has been awarded as one of the best oral communication for Biophysics at the Italian Society of Physics Congress (Trento, Italy)
- 2020 ▪ Author of an oral communication which has been awarded as one of the best oral communication for Biophysics at the Italian Society of Physics Congress (online due to COVID emergency): "Photosensitizing proteins for a targeted antibacterial photodynamic inactivation"

### Honours

- 2020 ▪ Member of the Scientific Advisory Board of European Society for Photobiology
- 2017 ▪ Qualification as Full professor in Applied Physics
- 2011- ▪ PhD Board in Physics, University of Parma

### Editorial activity

- 2019-present ▪ Associate Editor of Frontiers in Bioengineering and Biotechnology, section Nanobiotechnology.
- 2017-present ▪ Member of the Editorial Board of Advances in Physical Chemistry.
- 2014-2015 ▪ Guest Editor for Photochemical and Photobiological Sciences (Royal Society of Chemistry).

### Indexing

- H index (Scopus): 27
- Publications: 97 (plus 2 book chapters and 3 in press)
- Citations: 2079 (Scopus)

### Projects

- 09/2016-09/2019 PI for the University of Parma:
  - Protein based systems for drug delivery in antitumor photodynamic therapy (Fondazione di Piacenza e Vigevano) – original title: Sistemi basati su proteine per la veicolazione di farmaci per la terapia fotodinamica dei tumori (annual direct costs: 25000 euros).
- 01/2021-present PI for the University of Parma:
  - Photodynamic therapy targeted: a multivalent approach for tumor treatment with a potential relevance for SARS-CoV-2 epidemic (Fondazione di Piacenza e Vigevano) – original title: La terapia fotodinamica targeted: un approccio multivalente per il trattamento dei tumori con una possibile rilevanza per l'epidemia SARS-CoV-2.(direct costs: 90 000 euros for three years).
- 1997-2013 Participant of:
  - nazionali projects (PAIS1997; PAIS2002; CNR1998-2001; COFIN2001; COFIN2004; PRIN2006; PRIN2008; FIRB2003-2005).
  - internazionali projects (EU2004-2006; Azioni integrate Italia-Spagna 2009; Vigoni2009; Vigoni2011; Progetto di Grande Rilevanza Italia-Argentina del Ministero degli Esteri 2011-13).

## Congress Organization

### Organizing Committee of international meetings:

- "International visions on blood substitutes, Hemoglobin-based oxygen carriers: from chemistry to clinic", Parma 17-20/09/2006.
- "New challenges in protein science. A symposium in honor of W.A. Eaton", Parma 4-6/06/2008.
- "XII ISBS International Symposium on Blood substitutes, Parma 25-28/08/2009.
- XVII International Meeting "Oxygen binding and sensing proteins" (O2BiP), Parma 29/08-01/09/2012.
- XIX Congress of the ESP, Salzburg 30/08-03/09/2021

### Organizing Committee of national meetings:

- "Light on Biophysics", workshop, Parma 07/06/2019.
- Congress SIBPA-SIFB, Parma 07-09/07/2020, postponed to 2021.

### Advisory board of international meetings:

- XIX Congress of the ESP, Salzburg 30/08-03/09/2021

### Chairman:

- Session "Methodologies and techniques of experimental biology" (Meeting "Experimental Biology: from molecules to organism", 85° Congress of the Italian Society of Experimental Biology, Parma 29-30/11/2012).
- "Light on Biophysics", workshop, Parma 07/06/2019.
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## Conferences

- **17 oral communications** at INTERNATIONAL (VII European Biophysics Congress, Genova 2009; XVII International meeting "Oxygen binding and sensing proteins", Parma 2012; International on-line Symposium on Bioluminescence, Chemiluminescence and Luminescence Spectrometry 2021) and NATIONAL conferences (Congresso Nazionale Società Italiana di Fisica della Materia, Rimini 1998; LXXXIX Congresso Nazionale Società Italiana di Fisica, Parma 2003; XVII Congresso Nazionale della Società Italiana di Biofisica Pura ed Applicata, Pisa 2004; XCIV Congresso Nazionale Società Italiana di Fisica, Genova 2008; XCVI Congresso Nazionale Società Italiana di Fisica, Bologna 2010, Congresso della Società Italiana di Fotobiologia, Pisa 2013, Congresso della Società Italiana di Fotobiologia, Trento 2014, Congresso Nazionale della Società Italiana di Biofisica Pura ed Applicata, Cortona 2016, 103° Congresso Nazionale Società Italiana di Fisica, Trento 2017, 106° Congresso Nazionale Società Italiana di Fisica, online 2020; 106° Congresso Nazionale Società Italiana di Fisica, online 2021; Congresso Nazionale della Società Italiana di Biofisica Pura ed Applicata, online 2021)
- **5 invited communications** (XV Congresso Nazionale della Società Italiana di Biofisica Pura ed Applicata, Parma 2000; XC Congresso Nazionale della Società Italiana di Fisica, Brescia 2004; XCIII Congresso Nazionale Società Italiana di Fisica, Pisa 2007; XCVII Congresso Nazionale Società Italiana di Fisica, L'Aquila 2011, Congresso Nazionale della Società Italiana di Biofisica Pura ed Applicata, Ancona 2018).

## Invited Seminars

- Keep an eye on the cancers, "A theranostic approach to tumor PDT", Parma 13/11/2017.
- Stati generali della Ricerca, "When photophysics meets nanomedicine: a theranostic approach to tumor PDT", Piacenza 16/06/2018
- Stati generali della Ricerca, "Targeted photodynamical therapy", Piacenza 31/05/2019
- Workshop, La ricerca di nuove terapie contro I tumori, Piacenza 29/01/2020

## Memberships

- Member of.
- 2020-  
2016-  
2000-  
▪ European Society for Photobiology
  - Italian Society of Physics
  - Italian Society of Pure and Applied Biophysics

## Reviewer activities

### Reviewer of papers for:

- Photochemical and Phobiological Sciences, Scientific Reports, Frontiers, Bioconjugate Chemistry, ChemBiochem, Chemical Physics Letters, PCCP, *Int. J. Mol. Sci.*, *Biomolecules*, ACS Applied Bio Materials, *Biomaterial Science*, *Int. J. Molecular Sciences*, *Catalyst*, *Pharmaceuticals*, *Molecules*, *Biomolecules*, *Int J Pharmaceutics*.

### Reviewer of projects for:

- Miur (FARE2019, SIR2014, VQR, PRIN), University of Tor Vergata, University of Verona, University of Firenze.

Reviewer of PhD thesis for.

- University of Genova, University of Roma la Sapienza.

#### Publications

A Complete List of Published Works is attached in Annexes

- <https://orcid.org/0000-0001-7685-8554>
- <https://scholar.google.com/citations?user=i6tC3GUAAA&hl=it&scioq=abbruzzetti>

#### ANNEXES

List of documents annexed to my CV:

- Publications.

### Publications

1. Viappiani, C.; Abbruzzetti, S.; Small, J. R.; Libertini, L. J.; Small, E. W. An experimental methodology for measuring volume changes in proton transfer reactions in aqueous solutions. *Biophys. Chem.* **1998**, *73*, 13-22.
2. Abbruzzetti, S.; Viappiani, C.; Murgida, D. H.; Erra-Balsells, R.; Bilmes, G. M. Non toxic, water soluble photocalorimetric reference compounds for UV and visible excitation. *Chem. Phys. Lett.* **1999**, *304*, 167-172.
3. Abbruzzetti, S.; Crema, E.; Masino, L.; Vecli, A.; Viappiani, C.; Small, J. R.; Libertini, L. J.; Small, E. W. Fast events in protein folding. Structural volume changes accompanying the early events in the N→I transition of apomyoglobin induced by ultrafast pH jump. *Biophys. J.* **2000**, *78* (1), 405-415.
4. Abbruzzetti, S.; Viappiani, C.; Small, J. R.; Libertini, L. J.; Small, E. W. Kinetics of local helix formation in poly-L-glutamic acid studied by time-resolved photoacoustics: neutralization reactions of carboxylates in aqueous solutions and their relevance to the problem of protein folding. *Biophys. J.* **2000**, *79*, 2714-2721.
5. Abbruzzetti, S.; Carcelli, M.; Pelagatti, P.; Rogolino, D.; Viappiani, C. Photoinduced alkaline pH-jump on the nanosecond time scale. *Chem. Phys. Lett.* **2001**, *344*, 387-394.
6. Abbruzzetti, S.; Viappiani, C.; Bruno, S.; Bettati, S.; Bonaccio, M.; Mozzarelli, A. Functional Characterization of Heme Proteins Encapsulated in Wet Nanoporous Silica Gels. *J. Nanosci. Nanotech.* **2001**, *1* (4), 407-415.
7. Abbruzzetti, S.; Viappiani, C.; Bruno, S.; Mozzarelli, A. Enhanced geminate ligand rebinding upon photo-dissociation of silica gel-embedded myoglobin-CO. *Chem. Phys. Lett.* **2001**, *346*, 430-436.
8. Abbruzzetti, S.; Viappiani, C.; Small, J. R.; Libertini, L. J.; Small, E. W. Kinetics of histidine deligation from the heme in GuHCl unfolded Fe(III) cytochrome c studied by a laser induced pH-jump technique. *J. Am. Chem. Soc.* **2001**, *123*, 6649-6653.
9. Bruno, S.; Bonaccio, M.; Bettati, S.; Rivetti, C.; Viappiani, C.; Abbruzzetti, S.; Mozzarelli, A. High and low oxygen affinity conformations of T state hemoglobin. *Protein Sci.* **2001**, *10*, 2401-2407.
10. Librizzi, F.; Viappiani, C.; Abbruzzetti, S.; Cordone, L. Residual water modulates the dynamics of the protein and of the external matrix in "trehalose coated" MbCO: an infrared and flash photolysis study. *J. Chem. Phys.* **2002**, *116*, 1193-1200.
11. Abbruzzetti, S.; Carcelli, M.; Rogolino, D.; Viappiani, C. Deprotonation yields, pK<sub>a</sub>, and aci-nitro decay rates in some substituted o-nitrobenzaldehydes. *Photochem. Photobiol. Sci.* **2003**, *2*, 796-800.
12. Abbruzzetti, S.; Viappiani, C.; Sinibaldi, F.; Santucci, R. Kinetics of histidine deligation from the heme Fe(III) in N-fragment (residues 1-56) of cytochrome c. *Protein J.* **2004**, *23*, 519-527.
13. Viappiani, C.; Bettati, S.; Bruno, S.; Ronda, L.; Abbruzzetti, S.; Mozzarelli, A.; Eaton, A. W. New insights into allosteric mechanisms from trapping unstable protein conformations in silica gels. *Proc. Natl. Acad. Sci. USA* **2004**, *101*, 14414-14419.
14. Abbruzzetti, S.; Giuffrida, S.; Sottini, S.; Viappiani, C.; Cordone, L. Light-Induced Protein-Matrix Uncoupling and Protein Relaxation in Dry Samples of Trehalose Coated MbCO at Room Temperature. *Cell Biochem. Biophys.* **2005**, *43*, 431-438.
15. Abbruzzetti, S.; Grandi, E.; Viappiani, C.; Bologna, S.; Campanini, B.; Raboni, S.; Bettati, S.; Mozzarelli, A. Kinetics of Acid-Induced Spectral Changes in the GFPmut2 Chromophore. *J. Am. Chem. Soc.* **2005**, *127*, 626-635.
16. Abbruzzetti, S.; Sottini, S.; Viappiani, C.; Corrie, J. E. T. Kinetics of proton release after flash photolysis of 1-(2-nitrophenyl)ethyl sulfate (caged sulfate) in aqueous solutions. *J. Am. Chem. Soc.* **2005**, *127*, 9865 - 9874.
17. Sottini, S.; Abbruzzetti, S.; Spyrikis, F.; Bettati, S.; Ronda, L.; Mozzarelli, A.; Viappiani, C. Geminate rebinding in R state hemoglobin: kinetic and computational evidence for multiple hydrophobic pockets. *J. Am. Chem. Soc.* **2005**, *127*, 17427-17432.
18. Sottini, S.; Abbruzzetti, S.; Viappiani, C.; Bettati, S.; Ronda, L.; Mozzarelli, A. Evidence for two geminate rebinding states following laser photolysis of R state hemoglobin encapsulated in wet silica gels. *J. Phys. Chem. B* **2005**, *109*, 11411-11413.
19. Sottini, S.; Abbruzzetti, S.; Viappiani, C.; Ronda, L.; Mozzarelli, A. Determination of microscopic rate constants for CO binding and migration in myoglobin encapsulated in silica gels. *J. Phys. Chem. B* **2005**, *109*, 19523 - 19528.
20. Abbruzzetti, S.; Bruno, S.; Faggiano, S.; Grandi, E.; Mozzarelli, A.; Viappiani, C. Time-resolved methods in Biophysics. 2. Monitoring haem proteins at work with nanosecond laser flash photolysis. *Photochem. Photobiol. Sci.* **2006**, *5*, 1109-1120.



21. Abbruzzetti, S.; Sottini, S.; Viappiani, C.; Corrie, J. E. T. Acid-induced unfolding of myoglobin triggered by a laser pH-jump method. *Photochem. Photobiol. Sci.* **2006**, *5*, 621–628.
22. Campanini, B.; Schiaretti, F.; Abbruzzetti, S.; Kessler, D.; Mozzarelli, A. Sulfur Mobilization in Cyanobacteria. THE CATALYTIC MECHANISM OF L-CYSTINE C-S LYASE (C-DES) FROM SYNECHOCYSTIS. *J. Biol. Chem.* **2006**, *281*, 38769–38780.
23. Polverini, E.; Cugini, G.; Annoni, F.; Abbruzzetti, S.; Viappiani, C.; Gensch, T. Molten globule formation in apomyoglobin monitored by the fluorescent probe Nile red. *Biochemistry* **2006**, *45*, 5111 - 5121.
24. Ronda, L.; Bruno, S.; Viappiani, C.; Abbruzzetti, S.; Mozzarelli, A.; Lowe, K. C.; Bettati, S. Circular dichroism spectroscopy of tertiary and quaternary conformations of human hemoglobin entrapped in wet silica gels. *Protein Sci.* **2006**, *15*, 1961-1967.
25. Abbruzzetti, S.; Grandi, E.; Bruno, S.; Faggiano, S.; Spyraakis, F.; Mozzarelli, A.; Dominici, P.; Viappiani, C. Ligand migration in non symbiotic hemoglobin AHb1 from *Arabidopsis thaliana*. *J. Phys. Chem. B* **2007**, *111*, 12582-12590.
26. Bizzarri, R.; Nifosi, R.; Abbruzzetti, S.; Rocchia, W.; Guidi, S.; Arosio, D.; Garau, G.; Campanini, B.; Grandi, E.; Ricci, F.; Viappiani, C.; Beltram, F. Green Fluorescent Protein ground states: the influence of a second protonation site near the chromophore. *Biochemistry* **2007**, *46*, 5494-5504.
27. Bruno, S.; Faggiano, S.; Spyraakis, F.; Mozzarelli, A.; Abbruzzetti, S.; Grandi, E.; Viappiani, C.; Feis, A.; Mackowiak, S.; Smulevich, G.; Cacciatori, E.; Dominici, P. The reactivity with CO of AHb1 and AHb2 from *Arabidopsis thaliana* is controlled by the distal His E7 and internal hydrophobic cavities. *J. Am. Chem. Soc.* **2007**, *129*, 2880-2889.
28. Bruno, S.; Faggiano, S.; Spyraakis, F.; Mozzarelli, A.; Cacciatori, E.; Dominici, P.; Grandi, E.; Abbruzzetti, S.; Viappiani, C. Different roles of protein dynamics and ligand migration in non-symbiotic hemoglobins AHb1 and AHb2 from *Arabidopsis thaliana*. *Gene* **2007**, *398*, 224–233.
29. Abbruzzetti, S.; Bruno, S.; Faggiano, S.; Ronda, L.; Grandi, E.; Mozzarelli, A.; Viappiani, C. Characterization of ligand migration mechanisms inside haemoglobins from the analysis of geminate rebinding kinetics. *Methods in Enzymology - Globins and other NO-reactive Proteins in Microbes, Plants and Invertebrates* **2008**, *437* (part B), 329-345.
30. Ronda, L.; Abbruzzetti, S.; Bruno, S.; Bettati, S.; Mozzarelli, A.; Viappiani, C. Ligand-Induced Tertiary Relaxations During the T-to-R Quaternary Transition in Hemoglobin. *J. Phys. Chem. B* **2008**, *112*, 12790–12794, DOI: 10.1021/jp803040j.
31. Ronda, L.; Bruno, S.; Abbruzzetti, S.; Viappiani, C.; Bettati, S. Ligand reactivity and allosteric regulation of hemoglobin-based oxygen carriers. *Biochim. Biophys. Acta - Proteins and Proteomics* **2008**, *1784*, 1365–1377, DOI: doi:10.1016/j.bbapap.2008.04.021.
32. Voliani, V.; Bizzarri, R.; Nifosi, R.; Abbruzzetti, S.; Grandi, E.; Viappiani, C.; Beltram, F. Cis-Trans Photoisomerization of Fluorescent-Protein Chromophores. *J. Phys. Chem. B* **2008**, *112*, 10714-10722.
33. Abbruzzetti, S.; Faggiano, S.; Bruno, S.; Spyraakis, F.; Mozzarelli, A.; Dewilde, S.; Moens, L.; Viappiani, C. Ligand migration through the internal hydrophobic cavities in human neuroglobin. *Proc. Natl. Acad. Sci. USA* **2009**, *106* (45), 18984–18989, DOI: 10.1073/pnas.0905433106.
34. Caccia, D.; Ronda, L.; Frassi, R.; Perrella, M.; DelFavero, E.; Bruno, S.; Pioselli, B.; Abbruzzetti, S.; Viappiani, C.; Mozzarelli, A. PEGylation Promotes Hemoglobin Tetramer Dissociation. *Bioconjugate Chem.* **2009**, *20*, 1356–1366.
35. Faggiano, S.; Abbruzzetti, S.; Spyraakis, F.; Grandi, E.; Viappiani, C.; Bruno, S.; Mozzarelli, A.; Cozzini, P.; Astegno, A.; Dominici, P.; Brogioni, S.; Feis, A.; Smulevich, G.; Carrillo, O.; Schmidtke, P.; Bidon-Chanal, A.; Luque, F. J. Structural plasticity and functional implications of internal cavities in distal mutants of type 1 non-symbiotic hemoglobin AHb1 from *Arabidopsis thaliana*. *J. Phys. Chem. B* **2009**, *113*, 16028–16038.
36. Storti, B.; Elisei, F.; Abbruzzetti, S.; Viappiani, C.; Latterini, L. One-Pot Synthesis of Gold Nanoshells with High Photon-to-Heat Conversion Efficiency. *J. Phys. Chem. C* **2009**, *113*, 7516–7521.
37. Viappiani, C.; Abbruzzetti, S.; Vezzani, G. Photosensitivity of CO complexes with hemoglobins. *Medicina Subacquea e Iperbarica* **2009**, (2), 16-18.
38. Abbruzzetti, S.; Bizzarri, R.; Luin, S.; Nifosi, R.; Storti, B.; Viappiani, C.; Beltram, F. Photoswitching of E222Q GFP mutants: "concerted" mechanism of chromophore isomerization and protonation. *Photochem. Photobiol. Sci.* **2010**, *9*, 1307-1319, DOI: DOI: 10.1039/C0PP00189A
39. Bizzarri, R.; Serresi, M.; Cardarelli, F.; Abbruzzetti, S.; Campanini, B.; Viappiani, C.; Beltram, F. Single aminoacid replacement makes *Aequorea victoria* fluorescent proteins reversibly photoswitchable. *J. Am. Chem. Soc.* **2010**, *132*, 85–95.
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42. Abbruzzetti, S.; Faggiano, S.; Spyraakis, F.; Bruno, S.; Mozzarelli, A.; Astegno, A.; Dominici, P.; Viappiani, C. Oxygen and Nitric Oxide Rebinding Kinetics in Nonsymbiotic Hemoglobin AHb1 from *Arabidopsis thaliana*. *IUBMB Life* **2011**, *63*, 1094–1100, DOI: 10.1002/iub.546.
43. Abbruzzetti, S.; Viappiani, C. Volume Changes Associated with Solute–Solvent Reorganization Following Photoinduced Proton Transfer in Aqueous Solutions of 6-Methoxyquinoline. In *Hydrogen Bonding and Transfer in the Excited State*; Han, K. L.; Zhao, G. J., Eds.; John Wiley & Sons, Ltd: Chichester, 2011; pp 797-803.
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### Book chapters

1. Stefano Bruno, L. Ronda, S. Abbruzzetti, C. Viappiani, S. Bettati, S. Kumar Maji and A. Mozzarelli  
*Protein encapsulation, conformations and nanobiotoools. Encyclopedia of nanoscience and nanotechnology. Xth edition, edited by H.S.Nalva; American Scientific Publishers 2011, p. 481-517.*
2. Cristiano Viappiani, Stefania Abbruzzetti  
*"Volume Changes Associated with Solute-Solvent Reorganization Following Photoinduced Proton Transfer in Aqueous Solutions of 6 Methoxyquinoline"* in *Hydrogen Bonding and Transfer in the Excited-State*, edited by Ke-Li Han and Guang-Jiu Zhao, John Wiley & Sons, Ltd; ISBN: 978-0-470-66677-7; 2010.

