

**Prof. Dott. Andrea Bellelli**  
**curriculum vitae et studiorum**  
**elenco delle pubblicazioni scientifiche**

Andrea Bellelli e' nato nel 1958

Si e' laureato in Medicina e Chirurgia con il voto di 110/100 e lode nel luglio 1983 presso l'Universita' di Roma La Sapienza, e in Psicologia (indirizzo Clinico e di Comunita') con il voto di 110/110 e lode nel dicembre 2000 presso la stessa Universita'. E' abilitato all'esercizio della Professione di Medico-Chirurgo ed e' iscritto all'Ordine dei Medici-Chirurghi e Odontoiatri della Provincia di Roma.

Ha preso servizio in qualita' di Ricercatore presso il Centro di Studio sulla Biologia Molecolare del Consiglio Nazionale delle Ricerche (oggi Istituto di Biologia e Patologia Molecolari) nel febbraio 1988. Ha vinto il concorso per Primo Ricercatore nel 1997. Dal 1 novembre 2000 al 31 ottobre 2003 e' stato Professore Straordinario di Biochimica presso la Prima Facolta' di Medicina e Chirurgia dell'Universita' di Roma La Sapienza e dal 1 novembre 2003 e' Professore Ordinario.

**Attivita' didattica in sede nazionale**

Il prof. A. Bellelli tiene i seguenti corsi presso la Prima Facolta' di Medicina e Chirurgia dell'Universita' di Roma La Sapienza:  
Chimica e Propedeutica Biochimica nel Corso di Laurea Specialistica "B"  
Biochimica nel Corso di Laurea per Dietista (presso l'Ospedale C. Forlanini)  
Chimica e Propedeutica Biochimica nel Corso di Laurea per Tecnico di Laboratorio Biomedico (presso l'Ospedale C. Forlanini)  
Biochimica nel corso di Laurea in Infermieristica "B" (presso il Policlinico Umberto I).

**Attivita' didattica in sede internazionale**

Il prof. Andrea Bellelli tiene varie lezioni e seminari dietro invito, in corsi organizzati a livello internazionale, in particolare nei corsi avanzati organizzati dalla Federation of European Biochemical Societies:  
FEBS Advanced Course: Ligand binding. Theory and practice (Nove Hradý, CZ, 2014)  
FEBS Advanced Course: Ligand binding. Theory and practice (Nove Hradý, CZ, 2016)

**Ricopre i seguenti incarichi didattici e scientifici:**

Vice Presidente del corso di Laurea in Infermieristica "B" (presso il Policlinico Umberto I): 2004-oggi.  
Segretario della Societa' Italiana di Biochimica e Biologia Molecolare (SIB): 2003-2006.  
Direttore del Dipartimento di Scienze Biochimiche "A. Rossi Fanelli", Sapienza Universita' di Roma: 2009-2012 e 2012-2015.  
Presidente del Corso di Laurea Magistrale in Medicina e Chirurgia "B", Sapienza Universita' di Roma (dal 2015).

E' membro delle seguenti **societa' scientifiche**:

Societa' Italiana di Biochimica e Biologia Molecolare (SIB)

American Society of Biochemistry and Molecular Biology (ASBMB)

Accademia Medica di Roma

#### **Attivita' di divulgazione**

Il Prof. Andrea Bellelli ha curato con grande attenzione la divulgazione scientifica mediante pubblicazione di libri e di contributi su quotidiani a diffusione nazionale.

E' autore dei seguenti libri divulgativi:

1) Logica e Fatti nelle Teorie Freudiane (Antigone Edizioni, Torino, 2007).

2) La Costruzione dell'Omeopatia (Mondadori Universita', Milano, 2010).

Tiene inoltre un blog sull'edizione elettronica del Fatto Quotidiano, visionabile a questo [indirizzo web](#).

Le tematiche principali trattate sul blog sono inerenti alla scienza medica e alla medicina, nonche' alla politica della scienza e della medicina.

#### **Attivita' di ricerca scientifica**

L'attivita' di ricerca scientifica del prof. Andrea Bellelli e' centrata essenzialmente su tre linee tematiche distinte:

1) Studio delle proprieta' strutturali e funzionali delle proteine trasportatrici di ossigeno. L'emoglobina e' la proteina piu' studiata nella storia della biochimica e vanta oltre un secolo di ricerca nei piu' prestigiosi laboratori del mondo; le sue reazioni di combinazione e rilascio dell'ossigeno sono ormai comprese in grande dettaglio, fino al livello dei movimenti di singoli atomi, grazie agli studi di cristallografia, di termodinamica e di cinetica chimica rapida, nonche' all'uso delle tecniche di mutagenesi sito-specifica. Il prof. Bellelli ha rivolto la sua attenzione a vari aspetti del funzionamento dell'emoglobina, studiando in particolare quelle modificazioni chimiche o indotte mediante mutagenesi sito-specifica che possono avere rilevanza applicativa, soprattutto allo scopo di produrre preparati iniettabili capaci di espandere la volemia e di trasportare l'ossigeno (cosiddetti oxygen-carrying plasma expanders).

2) Studio del meccanismo catalitico di enzimi ad attivita' ossido-riduttiva. Le aminoossidasi (AO) sono enzimi ubiquitari, classificati in relazione al coenzima utilizzato in FAD-AO e CuAO. Il prof. Bellelli ha studiato enzimi appartenenti ad entrambe le classi ed in una pubblicazione del 1991 ha contribuito a chiarire il meccanismo di azione delle CuAO e gli intermedi del ciclo catalitico. Gli esperimenti, condotti inizialmente su CuAO di origine vegetale, sono stati replicati su CuAO di mammifero. Un altro tipo di enzima studiato dal prof. Bellelli e' la perossidasi, che catalizza l'ossidazione di substrati riducenti utilizzando come ossidante l'acqua ossigenata.

3) Biologia strutturale dello Schistosoma. La schistosomiasi e' una malattia parassitaria che colpisce vari mammiferi; l'uomo e' sensibile all'infestazione e la schistosomiasi e' seconda per diffusione soltanto alla malaria. Gli agenti della schistosomiasi umana appartengono a tre specie principali (Schistosoma mansoni, japonicum ed haematobium) e ad alcune minori. Il prof. Bellelli partecipa ad un progetto di ricerca volto ad identificare la struttura molecolare e le proprieta' funzionali di enzimi ed altre proteine di

Schistosoma (mansoni e japonicum) di potenziale interesse come bersagli di farmaci antiparassitari o antigeni utilizzabili per la produzione di vaccini. In particolare sono state studiate proteine rilevanti per la biosintesi delle prostaglandine, che il parassita secerne allo scopo di interferire con la risposta immunitaria dell'ospite (Fatty Acid Binding Protein, FABP o Sm14, da Schistosoma mansoni; Glutathione S-transferasi, GSH o Sh28 da Schistosoma haematobium) e proteine appartenenti alla via metabolica di detossificazione delle specie reattive dell'ossigeno (tioredossina, SmTRX, e perossiredossine 2 e 3, SmPRX2 e SmPRX3, tutte da Schistosoma mansoni).

### **Publicazioni scientifiche**

- 1: Brunori M, Condo' SG, Bellelli A, Giardina B. (1982) Hemoglobins from Wistar rat: crystallization of components and intraerythrocytic crystals. *Eur J Biochem.* 129: 459-63.
- 2: Condo' SG, Giardina B, Bellelli A, Lunadei M, Ferracin A, Brunori M (1984) Comparative studies of hemoglobins from newts (*Triturus cristatus*, *Triturus vulgaris*, *Triturus alpestris*): a kinetic approach. *Comp. Biochem. Physiol.* 74A, 545-548.
- 3: Ascenzi P, Condo' SG, Bellelli A, Barra D, Bannister WA, Giardina B, Brunori M. (1984) Molecular and functional properties of myoglobin from a marine turtle (*Dermochelys coriacea*). *Biochim. Biophys. Acta* 788, 281-289.
- 4: Brunori M, Condo' SG, Bellelli A, Giardina B, Micheli G. (1985) Tadpole *Xenopus laevis* hemoglobin. Correlation between structure and functional properties. *J Mol Biol.* 181: 327-9.
- 5: Bellelli A, Zolla L, Giardina B, Costantini S, Cau A, Brunori M. (1985) Hemocyanin from *Palinurus elephas*: general properties and effect of heavy metals. *Biochim. Biophys. Acta* 830, 325-331.
- 6: Amiconi G, Bertollini A, Bellelli A, Coletta M, Condo' SG, Brunori M. (1985) Evidence for two oxygen-linked binding sites for polyanions in dromedary hemoglobin. *Eur J Biochem.* 150: 387-93.
- 7: Bellelli A, Brunori M, Finazzi-Agro' A, Floris G, Giartosi A, Rinaldi A. (1985) Transient kinetics of copper-containing lentil (*Lens culinaris*) seedling amine oxidase. *Biochem J.* 232: 923-6.
- 8: Bellelli A, Brunori M. (1986) Hemoglobin solutions as blood substitutes: an overview. *Ann. Ital. Med. Int.* 1: 275-80.
- 9: Bellelli A, Ippoliti R, Currell D, Condo' SG, Giardina B, Brunori M. (1986) On the oxygen-linked anion-binding sites in human hemoglobin. Functional properties of human hemoglobin reacted with 4-isothiocyanatobenzenesulphonic acid and its hybrids. *Eur J Biochem.* 161: 329-33.
- 10: Bellelli A, Brunori M, Condo' SG, Giardina B. (1987) Human hemoglobin cross-linked through the polyphosphate-binding site. Functional properties and evidence for conformers. *J Biol Chem.* 262: 2624-9.

- 11: Brunori M, Bellelli A, Giardina B, Condo' S, Perutz MF. (1987) Is there a Root effect in *Xenopus* hemoglobin? *FEBS Lett.* 221: 161-6.
- 12: Bellelli A, Foon R, Ascoli F, Brunori M. (1987) Haem disorder in two myoglobins: comparison of reorientation rate. *Biochem J.* 246: 787-9.
- 13: Condo' SG, Giardina B, Bellelli A, Brunori M. (1987) *Xenopus laevis* hemoglobin and its hybrids with hemoglobin A. *Biochemistry.* 26: 6718-22.
- 14: Di Prisco G, Giardina B, D'Avino R, Condo' SG, Bellelli A, Brunori M. (1988) Antarctic fish hemoglobins: an outline of the molecular structure and oxygen binding properties. *Comp. Biochem. Physiol.* 90B, 585-591.
- 15: Bellelli A, Giardina B, Corda M, Pellegrini MG, Cau A, Condo' SG, Brunori M. (1988) Sexual and seasonal variability of *Palinurus elephas* hemocyanin. *Comp. Biochem. Physiol.* 91A, 445-449.
- 16: Brunori M, Coletta M, Bellelli A, Evangelista V, Benedetti PA, Brumen M. (1988) Microspectroscopy of red blood cells. *Life Sci. Adv. - Mol. Cell. Biol.* 7 89-93. Questo articolo e' stato ripubblicato su invito dell'editore in (1989) *Haematologia* 22, 69-78.
- 17: Coletta M, Amiconi G, Bellelli A, Bertollini A, Carsky J, Castagnola M, Condo' S, Brunori M. (1988) Alteration of T-state binding properties of naturally glycosylated hemoglobin, HbA1c. *J Mol Biol.* 203: 233-9.
- 18: Bellelli A, Benedetti PL, Coletta M, Ippoliti R, Brunori M. (1988) Human erythrocytes cross-linked with glutaraldehyde general properties and significance as a blood substitute. *Biochem Biophys Res Commun.* 156: 970-7.
- 19: Condo' SG, Bellelli A, Brunori M, Corda M, Pellegrini MG, Clementi EM, Giardina B. (1989) The functional properties of amphibian hemoglobin: the case of Salamander salamander and *Hydromantes* genei. *Comp. Biochem. Physiol.* 93A, 319-325.
- 20: Bellelli A, Ippoliti R, Brancaccio A, Lendaro E, Brunori M. (1990) Cooperative ligand binding of crosslinked hemoglobins at very high temperatures. *J. Mol. Biol.* 213, 571-574.
- 21: Bellelli A, Ippoliti R, Brunori M, Kam Z, Benveniste M, Emmanuel F, Turpin E, Alfsen A, Frenoy JP. (1990) Binding and internalization of ricin labelled with fluorescein isothiocyanate. *Biochem Biophys Res Commun.* 169: 602-9.
- 22: Maras B, Ippoliti R, De Luca E, Lendaro E, Bellelli A, Barra D, Bossa F, Brunori M. (1990) The amino acid sequence of a ribosome inactivating protein from *Saponaria officinalis* seeds. *Biochem. Intl.* 21, 831-838
- 23: Bellelli A, Blackmore RS, Gibson QH. (1990) Ligand binding to a hemoprotein lacking the distal histidine. The myoglobin from *aplysia limacina* (Val(E7)). *J Biol Chem.* 265: 13595-600.

- 24: Ippoliti R, Currell D, Lendaro E, Bellelli A, Castagnola M, Bolognesi M, Brunori M. (1990) Effect of aromatic isothiocyanates on the functional properties of human hemoglobin. Role of the stereochemistry of the charged group. *Biophys Chem.* 37: 293-302.
- 25: Bellelli A, Antonini G, Brunori M, Springer BA, Sligar SG. (1990) Transient spectroscopy of the reaction of cyanide with ferrous myoglobin. Effect of distal side residues. *J Biol Chem.* 265: 18898-901.
- 26: Lendaro E, Ippoliti R, Bellelli A, Brunori M, Zito R, Citro G, Ascenzi A. (1991) Brief communication. on the problem of immunological detection of antigens in skeletal remains. *Am J Phys Anthropol.* 86: 429-32.
- 27: Bellelli A, Finazzi Agro' A, Floris G, Brunori M. (1991) On the mechanism and rate of substrate oxidation by amine oxidase from lentil seedlings. *J Biol Chem.* 266: 20654-7.
- 28: Brunori M, Antonini G, Castagnola M, Bellelli A. (1992) Cooperative cyanide dissociation from ferrous hemoglobin. *J Biol Chem.* 267: 2258-63.
- 29: Giardina B, Arevalo F, Clementi ME, Ferrara L, Di Luccia A, Lendaro E, Bellelli A, Condo' SG. (1992) Evolution of ruminant hemoglobins. Thermodynamic divergence of ox and buffalo hemoglobins. *Eur J Biochem.* 204: 509-13.
- 30: Ippoliti R, Lendaro E, Bellelli A, Brunori M. (1992) A ribosomal protein is specifically recognized by saporin, a plant toxin which inhibits protein synthesis. *FEBS Lett.* 298: 145-8.
- 31: Gibson QH, Bellelli A, Regan R, Sharma PK, Vinogradov SN. (1992) Ligand binding by the chlorocruorin from *Eudistylia vancouverii*. *J Biol Chem.* 267: 11977-81.
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- 33: Lendaro E, Ippoliti R, Brancaccio A, Bellelli A, Vallone B, Ivaldi G, Sciarratta GV, Castello C, Tomova S, Brunori M, Amiconi G (1992) Hemoglobin Dallas (alpha 97(G4)Asn-->Lys): functional characterization of a high oxygen affinity natural mutant. *Biochim Biophys Acta.* 1180: 15-20.
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- 38: Bellelli A, Ippoliti R, Lendaro E, Brunori M. (1994) Analysis of biochemical processes in single living cells by quantitative microscopy. *Biochem Mol Biol Int*. 33: 289-311.
- 39: Lendaro E, Ippoliti R, Bellelli A, Brunori M, Evangelista V, Guidarini D, Benedetti PA. (1994) Intracellular dynamics of ricin followed by fluorescence microscopy on living cells reveals a rapid accumulation of the dimeric toxin in the Golgi apparatus. *FEBS Lett*. 344:99-104.
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- 41: Ippoliti R, Lendaro E, Bellelli A, Fiani ML, Benedetti PA, Evangelista V, Brunori M. (1996) A saporin-insulin conjugate: synthesis and biochemical characterization. *Nat Toxins*. 4: 156-62
- 42: Vallone B, Bellelli A, Miele AE, Brunori M, Fermi G. (1996) Probing the alpha1-beta2 interface of human hemoglobin by mutagenesis. Role of the FG-C contact regions. *J Biol Chem*. 271: 12472-80.
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- 45: Santanche' S, Bellelli A, Brunori M. (1997) The unusual stability of saporin, a candidate for the synthesis of immunotoxins. *Biochem Biophys Res Commun*. 234: 129-32.
- 46: Cutruzzola' F, Arese M, Grasso S, Bellelli A, Brunori M. (1997) Mutagenesis of nitrite reductase from *Pseudomonas aeruginosa*: tyrosine-10 in the c heme domain is not involved in catalysis. *FEBS Lett*. 412: 365-9.
- 47: Zolla L, Lupidi G, Bellelli A, Amiconi G. (1997) Effect of mercuric ions on human erythrocytes. Relationships between hypotonic swelling and cell aggregation. *Biochim Biophys Acta*. 1328: 273-80.
- 48: Medda R, Padiglia A, Bellelli A, Sarti P, Santanche S, Finazzi Agro' A, Floris G. (1998) Intermediates in the catalytic cycle of lentil (*Lens esculenta*) seedling copper-containing amine oxidase. *Biochem J*. 332: 431-7.
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- 50: Aime S, Fasano M, Paoletti S, Bellelli A, Coletta M, Ascenzi P. (1998) Stabilization of the T-state of ferrous human adult and fetal hemoglobin by Ln(III) complexes: a thermodynamic study. *J Inorg Biochem.* 71: 37-43.
- 51: Sarti P, Lendaro E, Ippoliti R, Bellelli A, Benedetti PA, Brunori M. (1999) Modulation of mitochondrial respiration by nitric oxide: investigation by single cell fluorescence microscopy. *FASEB J.* 13: 191-7.
- 52: Wilson EK, Bellelli A, Liberti S, Arese M, Grasso S, Cutruzzola' F, Brunori M, Brzezinski P. (1999) Internal electron transfer and structural dynamics of cd1 nitrite reductase revealed by laser CO photodissociation. *Biochemistry.* 38: 7556-64.
- 53: Miele AE, Santanche' S, Travaglini-Allocatelli C, Vallone B, Brunori M, Bellelli A. (1999) Modulation of ligand binding in engineered human hemoglobin distal pocket. *J Mol Biol.* 290: 515-24.
- 54: Medda R, Padiglia A, Bellelli A, Pedersen JZ, Agro' AF, Floris G. (1999) CuI-semiquinone radical species in plant copper-amine oxidases. *FEBS Lett.* 453: 1-5.
- 55: Frebort I, Sebela M, Svendsen I, Hirota S, Endo M, Yamauchi O, Bellelli A, Lemr K, Pec P. (2000) Molecular mode of interaction of plant amine oxidase with the mechanism-based inhibitor 2-butyne-1,4-diamine. *Eur J Biochem.* 267: 1423-33.
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- 78: Bellelli A, Brunori M, Miele AE, Panetta G, Vallone B. (2006) The allosteric properties of hemoglobin: insights from natural and site directed mutants. *Curr Protein Pept Sci.* 7: 17-45.
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