Curriculum Vitae
Prof. Paola Dominici

Department of Biotechnology, University of Verona
Strada Le Grazie 15, I-37134 Verona, Italy
Telephone: +39-045-802-7966;

mobile +39-3407758753

e-mail: paola.dominici@univr.it

ACADEMIC POSITIONS

2015 –present: Head of Department of Biotechnology, University of Verona

2007 – present: Full professor of Biochemistry, University of Verona

2007 – 2009 Chairperson of Agroindustrial Biotechnologies Studies, (Presidente del Consiglio dei Corsi di Laurea in Biotecnologie Agroindustriali)

2010- 2015 (Sept.) Chairperson Collegio Didattico di Bioinformatica e Biotecnologie Mediche

2012 –2015 (Sept.) PhD Program in Applied Biotechnologies Coordinator

1993-2006: Associate professor of Biochemistry, Department of Biotechnology, Faculty of Scienze MM.FF.NN., University of Verona

1992-1993 Associate professor of Enzymology, Università Cattolica del Sacro Cuore, Policlinico Gemelli (Rome)

1986-1988 Postdoctoral fellow at the University of Tennessee, Knoxville (USA) Department of Biochemistry, (lab Prof J.E. Churchich)

1983-1992 Research Assistant of Biochemistry, Faculty of Pharmacy, University of Perugia

EDUCATION

1982 Degree summa cum laude in Pharmaceutical Sciences (University of Perugia)

TEACHING

- General Biochemistry
- Enzymology
- Protein expression and purification

- Protein Engineering
- Protein Misfolding and Human Diseases

RESEARCH INTERESTS

Enzymology: Structure and function of pyridoxal-5'-phosphate dependent enzymes

Protein structure and function:

Calcium binding proteins: Plant calmodulin and calmodulin-like proteins. Human Neuronal Calcium Binding Proteins (NECAB isoforms I,2,3)

Calmodulin binding proteins: plant glutamate decarboxylases

Structure and function of non-symbiotic plant hemoglobins

Protein-protein interactions studied by experimental techniques (isothermal titration calorimetry, fluorescence and absorption spectroscopy, circular dichroism, dynamic light scattering)

Protein engineering: Protein rational mutagenesis; Enzyme directed evolution for biotechnological application

PUBLICATIONS

59. Structural insights into the heme pocket and oligomeric state of non-symbiotic hemoglobins from *Arabidopsis thaliana*

A. Astegno, C. Conter, M. Bertoldi and P. Dominici

***Biomolecules,* (2020),** *in press*

58. Cystathionine β-synthase is involved in cysteine biosynthesis and H2S generation in *Toxoplasma gondii*

Conter C,Fruncillo S, Fernández-Rodríguez C, Martínez-Cruz LA,Dominici P,AstegnoA.

***Sci Rep.* (2020) Sep 4;10(1):14657.**

57. Distinct Calcium Binding and Structural Properties of Two Centrin Isoforms from *Toxoplasma gondii*

Bombardi L, Pedretti M, Conter C, Dominici P, Astegno A.

Biomolecules. **(2020) Aug 4;10(8):1142.**

56. SAC3B is a target of CML19, the centrin 2 of *Arabidopsis thaliana*

M. Pedretti, C. Conter, P. Dominici, A. Astegno

Biochem J. **(2020) Jan 17; 477(1):173-189.**

55. Cation and peptide binding properties of CML7, a calmodulin-like protein from *Arabidopsis thaliana*

Trande, M., Pedretti, M., Bonza, M.C., Di Matteo, A., D'Onofrio, M., Dominici, P., Astegno, A. ***Journal of Inorganic Biochemistry,*** **(2019) 199, art. no. 110796**

54. Functional characterization and structure-guided mutational analysis of the transsulfuration enzyme cystathionine γ-lyase from *Toxoplasma gondii*

Maresi, E., Janson, G., Fruncillo, S., Paiardini, A., Vallone, R., Dominici, P., Astegno, A. ***International Journal of Molecular Sciences,*** **(2018) 19 (7), 2111**

53. Towards understanding plant calcium signaling 2 through calmodulin-like proteins: a biochemical and structural perspective

La Verde V, Dominici P. and Astegno A**.** ***Int J Mol Sci.*** **(2018) Apr 30;19(5).**

52. Binding of calcium and target peptide to calmodulin-like protein CML19, the centrin 2 of *Arabidopsis thaliana.*

La Verde V, Trande M, D'Onofrio M, Dominici P, Astegno A. ***Int J Biol Macromol.*** **(2018); 108:1289-1299**

51. *Arabidopsis* calmodulin-like protein CML36 is a calcium (Ca2+) sensor that interacts with the plasma membrane Ca2+-ATPase Isoform ACA8 and stimulates its activity.

Astegno A, Bonza MC, Vallone R, La Verde V, D'Onofrio M, Luoni L, Molesini B, Dominici P. ***J Biol Chem.*** **(2017) 292:15049-15061**

50. Unique substrate specificity of ornithine aminotransferase from *Toxoplasma gondii.*

Astegno A, Maresi E, Bertoldi M, La Verde V, Paiardini A, Dominici P.

Biochem J. (2017) 474(6):939-955.

49. Characterization of C-S lyase from *Lactobacillus delbrueckii* subsp. bulgaricus and its potential role in food flavors application

A. Allegrini, A. Astegno, V. La Verde, and P. Dominici;

J Biochem. **(2017);161(4):349-360**

48. Metal binding affinity and structural properties of calmodulin-like protein14 from *Arabidopsis thaliana*

R. Vallone, V. La Verde, M. D'Onofrio, A. Giorgetti, P. Dominici and A. Astegno

***Protein Science* (2016) DOI 10.1002/pro.2942**

47. Residues in the Distal Heme Pocket of *Arabidopsis* Non-Symbiotic Hemoglobins: Implication for Nitrite Reductase Activity

N. Kumar, A. Astegno, Jian Chen, A. Giorgetti and P. Dominici

Int. J. Mol. Sci. (2016) 17, 640; doi:10.3390/ijms17050640

46. Biochemical and biophysical characterization of a plant calmodulin: Role of the N- and C-lobes in calcium binding, conformational change, and target interaction

Astegno A, La Verde V, Marino V, Dell'Orco D, and Dominici P *Biochim Biophys Acta.* (2016) 1864(3):297-307.

45. Functional roles of the hexamer organization of plant glutamate decarboxylase

A. Astegno, G. Capitani and P. Dominici

Biochim BiophysS Acta (2015) 1854(9):1229-37

44. Role of active-site residues Tyr55 and Tyr114 in catalysis and substrate specificity of Corynebacterium diphtheriae C-S lyase
Astegno, A. Allegrini, S. Piccoli, A. Giorgetti and P. Dominici
Proteins: Structure, Function, and Bioinformatics, (2015) 83, 78–90

43. Structural plasticity of calmodulin on the surface of CaF2 nanoparticles preserves its biological function

Astegno A, Maresi E, Marino V, Dominici P, Pedroni M, Piccinelli F, Dell'Orco D.
Nanoscale, (2014) 6, 15037-15047

42. Characterization of C-S Lyase from *C. diphtheriae*: a possible target for new antimicrobial drugs
A. Astegno, A. Giorgetti, A. Allegrini and P. Dominici
BioMed Research International (2013) 2013:701536

41. Oxygen and nitric oxide rebinding kinetics in non-symbiotic hemoglobin AHb1 from *Arabidopsis thaliana*
Abbruzzetti S., Faggiano S., Spyrakis F., Bruno S., Mozzarelli A., Astegno A., Dominici P., Viappiani C.

IUBMB Life (2011), 63(12): 1094-100

40. Oxygen binding to *Arabidopsis thaliana* AHb2 nonsymbiontic hemoglobin: evidence for a role in oxygen transport
Spyrakis F, Bruno S, Bidon-Chanal A, Luque FJ, Abbruzzetti S, Viappiani C, Dominici P, Mozzarelli A.
IUBMB Life (2011) 63(5):355-62

39. Histidine E7 Dynamics Modulates Ligand Exchange between Distal Pocket and Solvent in AHb1 from *Arabidopsis thaliana.*

Spyrakis F, Faggiano S, Abbruzzetti S, Dominici P, Cacciatori E, Astegno A, Droghetti E, Feis A, Smulevich G, Bruno S, Mozzarelli A, Cozzini P, Viappiani C, Bidon-Chanal A, Luque FJ. *J PHYS CHEM B. (2011) 115(14):4138-46*.

38. Ligand Migration and Binding in Non-Symbiotic Hemoglobins of *Arabidopsis thaliana*
K. Nienhaus, P. Dominici, A. Astegno, S. Abbruzzetti, C. Viappiani, G. U. Nienhaus
BIOCHEMISTRY (2010) 49(35):7448-58.

37. Recombinant human GAD65 accumulates to high levels in transgenic tobacco plants when expressed as an enzymatically inactive mutant
L. Avesani, A. Vitale, E. Pedrazzini , M. deVirgilio, A. Pompa, A. Barbante, E.Gecchele, P. Dominici, F. Morandini, A. Brozzetti, A. Falorni, M. Pezzotti
PLANT BIOTECHNOL J, (2010) 8, 1-11

36. Structural plasticity and functional implications of internal cavities in distal mutants of type 1 non-symbiotic hemoglobin AHb1 fron *Arabidopsis thaliana*

Faggiano S, Abbruzzetti S, Spyrakis 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 FJ ***J PHYS CHEM B (2009) 113, 16028-38.***

35. A common structural basis for pH- and calmodulin-mediated regulation in plant glutamate decarboxylase
H. Gut, P. Dominici, S. Pilati, A. Astegno, M. V. Petoukhov, D. I. Svergun, M.G. Grutter and G. Capitani ***J MOL BIOL, (2009) 392, 334-351***

34. Different roles of protein dynamics and ligand migration in non-symbiotic hemoglobins AHb1 and AHb2 from *Arabidopsis thaliana*
S. Bruno, S. Faggiano, F. Spyrakis, A. Mozzarelli, E. Cacciatori, P. Dominici, E. Grandi, S. Abbruzzetti, C. Viappiani ***GENE, (2007) 398, 224- 233***

33. Ligand Migration in Nonsymbiotic Hemoglobin AHb1 from *Arabidopsis thaliana*
S. Abbruzzetti, E. Grandi, S. Bruno, S. Faggiano, F. Spyrakis, A. Mozzarelli, E. Cacciatori, P. Dominici, C. Viappiani ***J. PHYS. CHEM. B, (2007) 111, 11901- 11910***

32. The Reactivity with CO of AHb1 and AHb2 from *Arabidopsis thaliana* is Controlled by the Distal HisE7 and Internal Hydrophobic Cavities
S. Bruno, S. Faggiano, F. Spyrakis, A. Mozzarelli, S. Abbruzzetti, E. Grandi, C. Viappiani, A .Feis, S. Mackowiak, G. Smulevich, E. Cacciatori, P. Dominici ***J AM CHEM SOC, (2007) 129, 2880- 2889***

31. The quantum mechanically mixed-spin state in a non-symbiotic plant hemoglobin: The effect of distal mutation on AHb1 from *Arabidopsis thaliana*
Droghetti E, Howes BD, Feis A, Dominici P, Fittipaldi M, Smulevich G ***J INORG BIOCHEM (2007) 101, 1812- 1819***

30. *Arabidopsis* Nonsymbiotic Hemoglobin AHb1 Modulates Nitric Oxide Bioactivity
M Perazzolli, P Dominici , M C. Romero-Puertas, E Zago, J Zeier, M Sonoda, C Lamb, and M Delledonne ***PLANT CELL,*** *2004; 16: 2785 - 2794.*

29. Biochemical Properties of the PsbS Subunit of Photosystem II Either Purified from Chloroplast or Recombinant
P Dominici, S Caffarri, F Armenante, S Ceoldo, M Crimi, and R Bassi ***J. BIOL. CHEM., 2002; 277: 22750 - 22758.***

28. Structural insight into Parkinson's disease treatment from drug-inhibited DOPA decarboxylase.
P Burkhard, P Dominici, C Borri-Voltattorni, JN Jansonius, and VN Malashkevich
NATURE STRUCT BIOL, 2001; 8(11): 963-7.

27. Preliminary X-ray analysis of a new crystal form of recombinant pig kidney DOPA decarboxylase.
VN Malashkevich, P Burkhard, P Dominici, PS Moore, C Borri Voltattorni, and JN Jansonius
Acta Crystallogr D Biol Crystallogr, *1999; 55 (Pt 2): 568-70.*

26. Reaction of dopa decarboxylase with alpha-methyldopa leads to an oxidative deamination producing 3,4-dihydroxyphenylacetone, an active site directed affinity label.
M Bertoldi, P Dominici, PS Moore, B Maras, and CB Voltattorni
BIOCHEMISTRY, *1998; 37(18): 6552-61.*

25. Mutation of cysteine 111 in Dopa decarboxylase leads to active site perturbation
P. DOMINICI, P. S. MOORE, S. CASTELLANI, M. BERTOLDI, and C. B. VOLTATTORNI
PROTEIN SCIENCE, *1997; 6: 2007.*

24. Aromatic amino acid methyl ester analogs form quinonoidal species with Dopa decarboxylase.
PS Moore, M Bertoldi, P Dominici, and C Borri Voltattorni

FEBS Lett, *1997; 412(1): 245-8.*

23. Mechanism-based Inactivation of Dopa Decarboxylase by Serotonin
M. Bertoldi, P. S. Moore, B. Maras, P. Dominici, and C. Borri Voltattorni
J. Biol. Chem., *1996; 271: 23954.*

22. Cloning and expression of pig kidney dopa decarboxylase: comparison of the naturally occurring and recombinant enzymes.
PS Moore, P Dominici, and C Borri Voltattorni
Biochem J, 1996; 315 (Pt 1): 249-56.

21. Transaldimination induces coenzyme reorientation in pig kidney dopa decarboxylase.
PS Moore, P Dominici, and CB Voltattorni ***BIOCHIMIE,*** *Jan 1995; 77(9): 724-28.*

20. Single crystal polarized absorption microspectrophotometry of aromatic L-amino acid decarboxylase.
Alessio Peracchi, Andrea Mozzarelli, Gian Luigi Rossi, Paola Dominici and Carla Borri Voltattorni ***Protein Peptide Lett, 1994; 1(2): 98-105***

19. Dissociation, unfolding and refolding trials of pig kidney 3,4-dihydroxyphenylalanine (dopa) decarboxylase.
P Dominici, PS Moore, and C Borri Voltattorni ***Biochem J,*** *1993; 295 (Pt 2): 493-500.*

18. Modified purification of L-aromatic amino acid decarboxylase from pig kidney.
P Dominici, PS Moore, and CB Voltattorni ***Protein Expr Purif,*** *1993; 4(4): 345-7.*

17. Crystallization and preliminary X-ray analysis of pig kidney DOPA decarboxylase.
VN Malashkevich, P Filipponi, U Sauder, P Dominici, JN Jansonius, and C Borri Voltattorni ***J Mol Biol,*** *1992; 224(4): 1167-70.*

16. Pig kidney 3,4-dihydroxyphenylalanine (dopa) decarboxylase. Primary structure and relationships to other amino acid decarboxylases
B Maras, P Dominici, D Barra, F Bossa, and CB Voltattorni ***Eur. J. Biochem., 1991; 201: 385.***

15. Affinity labeling of pig kidney 3,4-dihydroxyphenylalanine (Dopa) decarboxylase with N-(bromoacetyl)pyridoxamine 5'-phosphate. Modification of an active-site cysteine
P Dominici, B Maras, G Mei, and C Borri Voltattorni Eur. J. Biochem., 1991; 201: 393.

14. Pig kidney dopa decarboxylase. Structure and function
P. Dominici, P. Filipponi, M. E. Schinina, D. Barra, and C. Borri Voltattorni Ann. N.Y. Acad. Sci., 1990; 585: 162.

13. Proteolytic cleavage of pyridoxal kinase into two structural domains.
P Dominici, F Kwok, and JE Churchich Biochimie, 1989; 71(4): 585-90.

12. Pig kidney dopa decarboxylase: inactivation by iodoacetamide and sequence of the carboxyamidomethylcysteine-containing peptide.
P Dominici, M Simmaco, B Tancini, D Barra, and C Borri Voltattorni J Enzyme Inhib, 1989; 3(1): 67-76.

11. Affinity labeling of pyridoxal kinase with adenosine polyphosphopyridoxal
P Dominici, G Scholz, F Kwok, and JE Churchich J. Biol. Chem., 1988; 263: 14712 - 14716.

10. Limited tryptic proteolysis of pig kidney 3,4-dihydroxyphenylalanine decarboxylase.
B Tancini, P Dominici, M Simmaco, ME Schinina, D Barra, and CB Voltattorni Arch Biochem Biophys, 1988; 260(2): 569-76.

9. Purification and characterization of rat-liver 3,4- dihydroxyphenylalanine decarboxylase
P Dominici, B Tancini, D Barra, and CB Voltattorni Eur. J. Biochem., 1987; 169: 209.

8. DNA methylating activity in murine lymphoma cells xenogenized by triazene derivatives.
P Puccetti, P Fuschiotti, P Dominici, C Borri-Voltattorni, L Romani, and MC Fioretti Int J Cancer, 1987; 39(6): 769-73.

7. DNA methylating activity in murine lymphoma cells treated with xenogenizing chemicals.
P Puccetti, M Allegrucci, C Borri Voltattorni, L Romani, P Dominici, and MC Fioretti Cancer Detect Prev Suppl, 1987; 1: 311-6.

6. Stereospecificity of sodium borohydride reduction of pig kidney dopa decarboxylase.
P Dominici, B Tancini, and CB Voltattorni Arch Biochem Biophys, 1986; 251(2): 762-6

5. Chemical modification of pig kidney 3,4-dihydroxyphenylalanine decarboxylase with diethyl pyrocarbonate. Evidence for an essential histidyl residue
P Dominici, B Tancini, and C Borri Voltattorni J. Biol. Chem., 1985; 260: 10583 - 10589.

4. An essential arginine residue at the binding site of pig kidney 3,4-dihydroxyphenylalanine decarboxylase.
B Tancini, P Dominici, D Barra, and CB Voltattorni Arch Biochem Biophys, 1985; 238(2): 565-73.

3. Dye-sensitized photo-oxidation of pig kidney Dopa decarboxylase.
A Pasqua, P Dominici, SM Murgia, A Poletti, and C Borri Voltattorni Biochem Int, 1984; 9(4): 437-46.

2. Inhibition of pig kidney dopa decarboxylase by coenzyme-5-hydroxytryptophan adducts.
P Dominici, M Curini, A Minelli, and C Borri Voltattorni Experientia, 1984; 40(8): 834-5.

1. Interaction of aromatic amino acids in D and L forms with 3,4-dihydroxyphenylalanine decarboxylase from pig kidney.
CB Voltattorni, A Minelli, and P Dominici Biochemistry, 1983; 22(9): 2249-54.