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CURRICULUM VITAE

Surname:	Carra
Given name:	Serena
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Date of Birth:	October 5, 1973
Place of Birth:	Carpi (Modena), Italy
Nationality:	Italian
Language:	English (fluent), French (fluent), Italian (mother tongue)

Qualifications, Research Experience & Training

Nov. 2015	Associate Professor of Molecular Biology , University of Modena and Reggio Emilia
July 2011-Oct. 2015	Assistant Professor, program Rita Levi Montalcini University of Modena and Reggio Emilia
June-2009-July 2011	Assistant Professor , University Medical Center Groningen
June-2007-May 2009	Post-doctoral fellow , University Medical Center Groningen
Feb.2004-April 2007	Post-doctoral fellow , under the supervision of Prof. Jacques Landry, Centre de recherche L'Hôtel-Dieu de Québec, Laval University, Québec, Canada.
2004	Ph.D. in Neurobiology , University of Catania, Italy.
Oct. 1999	Specialization in Pharmaceutical Research Methods , University of Modena.
Oct. 1998	M.Sc. in Chemistry and Pharmaceutical Sciences , University of Modena, Italy, graduated Oct., 14 th 1998, honors with distinctions.

Peer-reviewed Publication List

1. Morelli FF, Verbeek S, Bertacchini J, Vinet J, Mediani L, Marmiroli S, Cenacchi G, Nasi M, De Biasi S, Brunsting JF, Lammerding J, Pegoraro E, Angelini C, Tupler R, Alberti S, **Carra S**. Aberrant compartment formation by HSPB2 mislocalizes lamin A and compromises nuclear integrity and function. *Cell Rep*. 2017 Aug 29;20(9):2100-2115. doi: 10.1016/j.celrep.2017.08.018.
2. Rusmini P, Cristofani R, Galbiati M, Cicardi ME, Meroni M, Ferrari V, Vezzoli G, Tedesco B, Messi E, Piccolella M, **Carra S**, Crippa V, Poletti A. The Role of the Heat Shock Protein B8 (HSPB8) in Motoneuron Diseases. *Front Mol Neurosci*. 2017 Jun 21;10:176. doi: 10.3389/fnmol.2017.00176. eCollection 2017. Review.
3. Cristofani R, Crippa V, Vezzoli G, Rusmini P, Galbiati M, Cicardi ME, Meroni M, Ferrari V, Tedesco B, Piccolella M, Messi E, **Carra S**, Poletti A. The small heat shock protein B8 (HSPB8) efficiently removes aggregating species of dipeptides produced in C9ORF72-related neurodegenerative diseases. *Cell Stress Chaperones*. 2017 Jun 12. doi: 10.1007/s12192-017-0806-9.
4. Alberti S, Mateju D, Mediani L and **Carra S**. "Granulostasis: protein quality control of RNP granules". Review. *Front Mol Neurosci*. 2017 Mar 27;10:84. doi: 10.3389/fnmol.2017.00084. eCollection 2017.
5. Mateju D, Franzmann TM, Patel A, Kopach A, Boczek EE, Maharana S, Lee HO, **Carra S**, Hyman AA, Alberti S. An aberrant phase transition of stress granules triggered by misfolded protein and prevented by chaperone function. *EMBO J*. 2017 Apr 4. pii: e201695957. doi: 10.15252/embj.201695957.
6. **Carra S**, Alberti S, Arrigo PA, Benesch JL, Benjamin IJ, Boelens W, Bartelt-Kirbach B, Brundel BJ, Buchner J, Bukau B, Carver JA, Ecroyd H, Emanuelsson C, Finet S, Golenhofen N, Goloubinoff P, Gusev N, Haslbeck M, Hightower LE, Kampinga HH, Kleit RE, Liberek K, Mchaourab HS, McMenimen KA, Poletti A, Quinlan R, Strelkov SV, Toth ME, Vierling E, Tanguay RM. The growing world of small heat shock proteins: from structure to functions. *Cell Stress Chaperones*. 2017 Mar 31. doi: 10.1007/s12192-017-0787-8. Review.
7. Morelli FF, Mediani L, Heldens L, Bertacchini J, Bigi I, Carrà AD, Vinet J, **Carra S**. An interaction study in mammalian cells demonstrates weak binding of HSPB2 to BAG3, which is regulated by HSPB3 and abrogated by HSPB8. *Cell Stress Chaperones*. 2017 Feb 8. doi: 10.1007/s12192-017-0769-x.
8. Cristofani R, Crippa V, Rusmini P, Cicardi ME, Meroni M, Giorgetti E, Sala G, Galbiati M, Piccolella M, Messi E, Ferrarese C, **Carra S**, Poletti A. Inhibition of retrograde transport modulates misfolded protein accumulation and clearance in motoneuron diseases. *Autophagy*. 2017 Apr 12:0. doi: 10.1080/15548627.2017.1308985.
9. Piccolella M, Crippa V, Cristofani R, Rusmini P, Galbiati M, Elena Cicardi M, Meroni M, Ferri N, Morelli FF, **Carra S**, Messi E, Poletti A. The small heat shock protein B8 (HSPB8) modulates proliferation and migration of breast cancer cells. *Oncotarget*. 2017 Feb 7;8(6):10400-10415. doi: 10.18632/oncotarget.14422.
10. Ganassi M, Mateju D, Bigi I, Mediani L, Poser I, Lee HO, Seguin SJ, Morelli FF, Vinet J, Leo G, Pansarasa O, Cereda C, Poletti A, Alberti S, **Carra S**. A Surveillance Function of the HSPB8-BAG3-HSP70 Chaperone Complex Ensures Stress Granule Integrity and Dynamism. *Mol Cell*. 2016 Sep 1;63(5):796-810. doi: 10.1016/j.molcel.2016.07.021.
11. Crippa V, Cicardi ME, Ramesh N, Seguin SJ, Ganassi M, Bigi I, Diacci C, Zelotti E, Baratashvili M, Gregory JM, Dobson CM, Cereda C, Pandey UB, Poletti A, **Carra S**. The chaperone HSPB8 reduces the accumulation of truncated TDP-43 species in cells

- and protects against TDP-43-mediated toxicity. *Hum Mol Genet.* 2016 Jul 27. pii: ddw232
12. Crippa V, D'Agostino VG, Cristofani R, Rusmini P, Cicardi ME, Messi E, Loffredo R, Pancher M, Piccolella M, Galbiati M, Meroni M, Cereda C, **Carra S**, Provenzani A, Poletti A. Transcriptional induction of the heat shock protein B8 mediates the clearance of misfolded proteins responsible for motor neuron diseases. *Sci Rep.* 2016 Mar 10;6:22827. doi: 10.1038/srep22827
 13. Rusmini P, Crippa V, Cristofani R, Rinaldi C., Cicardi ME, Galbiati M, **Carra S**, Bilal M, Greensmith L, Poletti A The Role of the Protein Quality Control System in SBMA. *J Mol Neurosci.* 2015 Nov 14 [Epub ahead of print]
 14. Vos MJ, **Carra S.**, Kanon B., Bosveld F., Klauke K., Sibon O.C.M., Kampinga H.H. Specific protein homeostatic functions of small heat shock proteins increase lifespan. *Aging Cell* 2015, Dec 25. doi: 10.1111/accel.12422.
 15. Poletti A and **Carra S.** Role of HSPB8 in the proteostasis network: from protein synthesis to protein degradation and beyond. Series Title: Heat Shock Proteins; book title: "The Big Book of Small Heat Shock Proteins", Eds RM Tanguay and LE Hightower, Springer International Publishing AG, ISBN: 978-3-319-16076-4.
 16. Seguin SJ, Morelli FF, Vinet J, Amore D, De Biasi S, Poletti A, Rubinsztein DC, **Carra S.** Inhibition of autophagy, lysosome and VCP function impairs stress granule assembly. *Cell Death Differ.* 2014 Jul 18. doi: 10.1038/cdd.2014.103.
 17. Minoia M, Boncoraglio A, Vinet J, Morelli FF, Brunsting JF, Poletti A, Krom S, Reits E, Kampinga HH, **Carra S.** BAG3 induces the sequestration of proteasomal clients into cytoplasmic puncta: implication for a proteasome-to-autophagy switch. *Autophagy*, 2014, 10.4161/auto.29409.
 18. Kakkar V, Meister-Broekema M, Minoia M, **Carra S**, Kampinga HH. Barcoding Heat Shock Proteins to Human Diseases: Looking Beyond The Heat Shock Response. *Disease Dis Model Mech.* 2014 Apr;7(4):421-34. doi: 10.1242/dmm.014563.
 19. Yang J, **Carra S**, Zhu WG, Kampinga HH. The regulation of the autophagic network and its implications for human disease. *Int J Biol Sci.* 2013 Dec 1;9(10):1121-33. doi: 10.7150/ijbs.6666.
 20. Crippa V, Boncoraglio A, Galbiati M, Aggarwal T, Rusmini P, Giorgetti E, Cristofani R, **Carra S**, Pennuto M, Poletti A. Differential autophagy power in the spinal cord and muscle of transgenic ALS mice. *Front Cell Neurosci.* 2013 Nov 26;7:234. doi: 10.3389/fncel.2013.00234.
 21. Rusmini P, Crippa V, Giorgetti E, Boncoraglio A, Cristofani R, **Carra S**, Poletti A. Clearance of the mutant androgen receptor in motoneuronal models of spinal and bulbar muscular atrophy. *Neurobiol Aging.* 2013 Nov;34(11):2585-603. doi: 10.1016/j.neurobiolaging.2013.05.026.
 22. **Carra S**, Rusmini P, Crippa V, Giorgetti E, Boncoraglio A, Cristofani R, Naujock M, Meister M, Minoia M, Kampinga HH and Poletti A. Different anti-aggregation and pro-degradative functions of the members of the mammalian sHSP family in neurological disorders. *Phil. Trans. R. Soc. B*, 2013 Mar 25;368(1617):20110409. doi: 10.1098/rstb.2011.0409.
 23. Klionsky DJ, Abdalla FC, Abeliovich H, Abraham RT, Acevedo-Arozena A, Adeli K, Agholme L, Agnello M, Agostinis P, Aguirre-Ghiso JA, et al., Guidelines for the use and interpretation of assays for monitoring autophagy. *Autophagy.* 2012 Apr;8(4):445-544.
 24. Boncoraglio A, Minoia M, **Carra S.** The family of mammalian small heat shock proteins (HSPBs): Implications in protein deposit diseases and motor neuropathies. *Int J Biochem Cell Biol.* 2012 Oct;44(10):1657-69. doi: 10.1016/j.biocel.2012.03.011.
 25. **Carra S**, Crippa V, Rusmini P, Boncoraglio A, Minoia M, Giorgetti E, Kampinga HH, Poletti A. Alteration of protein folding and degradation in motor neuron diseases:

- Implications and protective functions of small heat shock proteins. *Prog Neurobiol.* 2012 May;97(2):83-100. doi: 10.1016/j.pneurobio.2011.09.009.
26. Seidel K, Vinet J, den Dunnen WFA, Brunt ER, Meister M, Boncoraglio A, Zijlstra MP, Boddeke HWGM, Rüb U, Kampinga HH and **Carra S**. The HSPB8-BAG3 chaperone complex is upregulated in astrocytes in the human brain affected by protein aggregation diseases. *Neuropathol Appl Neurobiol.* 2012 Feb;38(1):39-53. doi: 10.1111/j.1365-2990.2011.01198.x.
 27. Gamerding M, **Carra S**, Behl C. Emerging roles of molecular chaperones and co-chaperones in selective autophagy: focus on BAG proteins. *J Mol Med (Berl).* 2011 Dec;89(12):1175-82. doi: 10.1007/s00109
 28. Hishiya A, Salman MN, **Carra S**, Kampinga HH and Takayama S. BAG3 directly interacts with mutated alphaB-crystallin to suppress its aggregation and toxicity. *PLoS ONE*, 2011 Mar 15;6(3):e16828.
 29. **Carra S**, Boncoraglio A, Kanon B, Brunsting JF, Minoia M, Rana A, Vos MJ, Seidel K, Sibon OC, Kampinga HH. Identification of the Drosophila ortholog of HSPB8: implication of HSPB8 loss of function in protein folding diseases. *J Biol Chem.* 2010. Nov 26;285(48):37811-22.
 30. Vos MJ, Zijlstra MP, **Carra S**, Sibon OC, Kampinga HH. Small heat shock proteins, protein degradation and protein aggregation diseases. *Autophagy.* 2011. 7(1). 101-103
 31. Vos MJ, Zijlstra MP, Kanon B, van Waarde-Verhagen MA, Brunt ER, Oosterveld-Hut HM, **Carra S**, Sibon OC, Kampinga HH. HSPB7 is the most potent polyQ aggregation suppressor within the HSPB family of molecular chaperones. *Hum Mol Genet.* 2010. 19(23):4677-93.
 32. Crippa V, **Carra S**, Rusmini P, Sau D, Bolzoni E, Bendotti C, De Biasi S, Poletti A. A role of small heat shock protein B8 (HSPB8) in the autophagic removal of misfolded proteins responsible for neurodegenerative diseases. *Autophagy.* 2010. 6(7):958-60.
 33. Crippa V, Sau D, Rusmini P, Boncoraglio A, Onesto E, Bolzoni E, Galbiati M, Fontana E, Marino M, **Carra S**, Bendotti C, De Biasi S, Poletti A. The small heat shock protein B8 (HSPB8) promotes autophagic removal of misfolded proteins involved in amyotrophic lateral sclerosis (ALS). *Hum Mol Genet.* 2010. 19(17):3440-56.
 34. Sun X, Fontaine JM, Hoppe AD, **Carra S**, DeGuzman C, Martin JL, Simon S, Vicart P, Welsh MJ, Landry J, Benndorf R. Abnormal interaction of motor neuropathy-associated mutant HspB8 (Hsp22) forms with the RNA helicase Ddx20 (gemin3). *Cell Stress & Chaperones*, 2010. 15(5) 567-582
 35. Fuchs M, Poirier DJ, Seguin S, Lambert H, **Carra S**, Charrette SJ, Landry J. Identification of the key structural motifs involved in HspB8/HspB6-Bag3 interaction. *Biochem J.* 2009. 425(1):245-55.
 36. **Carra S** and Kampinga HH. Cytoprotective function of small stress proteins in conformational disorders. In Review Book: Small Stress Proteins and Human Diseases. Chapter 1.1, 2010, Nova Publishers.
 37. **Carra S**. The stress-inducible HspB8-Bag3 complex induces the eIF2alpha kinase pathway: Implications for protein quality control and viral factory degradation? *Autophagy.* 2009. 5(3):428-9.
 38. **Carra S**, Brunsting JF, Lambert H, Landry J, Kampinga HH. HspB8 participates in protein quality control by a non chaperone-like mechanism that requires eIF2alpha phosphorylation. *J Biol Chem.* 2008. 284(9): 5523-32.
 39. Hageman J, Vos MJ, **Carra S**, Kampinga HH. Structural and functional homologies and diversities between members of the human HspH (Hsp110), HspA (Hsp70), DnaJ (Hsp40) and HspB (Hsp27) families. *Biochemistry*, 2008. 47(27):7001-11. Review.
 40. **Carra S**, Seguin SJ and Landry J. HspB8 and Bag3: a new chaperone complex targeting misfolded proteins to macroautophagy. *Autophagy.* 2008. 4(2):237-9.

41. **Carra S**, Seguin SJ, Lambert H and Landry J. HspB8 chaperone activity toward poly(Q)-containing proteins depends on its association with Bag3, a stimulator of macroautophagy. *J Biol Chem*. 2008. 283(3):1437-44.
42. **Carra S** & Landry J. Role of HspB1 and HspB8 in hereditary peripheral neuropathies: beyond the chaperone function. In Review Book: Heat shock proteins and the brain: implications for neurodegenerative diseases and neuroprotection; Chapter 7, 139-155, 2008, Editors: Asea AAA, Brown IR.
43. **Carra S** & Landry J. Small Heat Shock Proteins in Neurodegenerative Diseases. In Review Book: Heat Shock Proteins in Biology and Medicine; Section VI, Chapter 18, 331-352, 2006, Editors: Jurgen Radons and Gabriele Multhoff.
44. **Carra S**, Sivilotti M, Chavez-Zobel AT, Lambert H, Landry J. HspB8, a small heat shock protein mutated in human neuromuscular disorders, has in vivo chaperone activity in cultured cells. *Hum. Mol. Genetics*, 2005. 14(12):1659-69.
45. **Carra S**, Vinet J, Blom JM, Brunello N, Barden N, Tascedda F. Chronic treatment with desipramine and fluoxetine modulate BDNF, CaMKKalpha and CaMKKbeta mRNA levels in the hippocampus of transgenic mice expressing antisense RNA against the glucocorticoid receptor. *Neuropharmacology*. 2004. 47(7):1062-9.
46. Vinet J, **Carra S**, Blom JM, Harvey M, Brunello N, Barden N, Tascedda F. Cloning of mouse Ca²⁺/calmodulin-dependent protein kinase kinase beta (CaMKKβ) and characterization of CaMKKβ and CaMKKα distribution in the adult mouse brain. *Mol. Brain Research*. 2003. 111:216-21.
47. Blom JM, Tascedda F, **Carra S**, Ferraguti C, Barden N, Brunello N. Altered regulation expression of CREB by chronic antidepressant administration in the brain of transgenic mice with impaired glucocorticoid receptor function. *Neuropsychopharmacology*, 2002. 26(5):605-14.
48. Tascedda F, Blom JM, **Carra S**, Brunello N, Racagni G, Riva MA. Modulation of glutamate receptors in response to the novel antipsychotic olanzapine in rats. *Biol.Psychiatry*, 2001. 50(2):117-22.

Awards

Ferruccio Ritossa Early Career Award for 2017, The 8th international congress on stress proteins in biology and medicine, August 13-17, 2017, Turku, Finland

Poster Prize (2017) Phase Transitions in Biology and Disease, 2-3 May 2017, Leuven, Belgium

Poster Prize (2014) from AriSLA foundation

Youth Travel Fund (2009) from EMBO meeting/Federation of European Biochemistry society.

Best postdoctoral poster presentation Award (2006) Annual Meeting of the Faculty of Medicine, Laval University, Québec, Canada.

Best Ph.D. oral presentation Award (2004) Hôtel Dieu de Québec, Laval University, Québec, Canada.

Travelship Award (2003) from the Italian Society of Pharmacology.

Poster Award (2000) XXIInd Collegium Internationale Neuro-Psychopharmacologicum, Belgio, Bruxelles.

Ph.D. funding (2000-2004) Ph.D. salary financed by European Commission-Structural Funds and Ministero dell'Università e della Ricerca Scientifica e Tecnologica.

Travelship Award (2000) from the Italian Society of Pharmacology.

Poster Award (1999) European Regional Congress of the World Federation of Societies of Biological Psychiatry, Florence, Italy.

Ongoing Research support

1. **Ministero degli Affari Esteri e della Cooperazione Internazionale** (Nov. 2017-Oct. 2019); Italian PI: Carra S; Israeli PI : Ben-Zvi A.
2. **PRIN** (February 2017 – February 2020); Coordinator: Poletti A.; partners: Carra S; Carrì MT; Cozzolino M; Crosio C; Ratti A; Chiò A.
3. **Ministero degli Affari Esteri e della Cooperazione Internazionale** (Oct. 2016-Sept. 2018); Italian PI: Carra S; Israeli PI : Kaganovich D.
4. **JPND** (April 2016-March 2019); Coordinator: Alberti S. (Germany); partners: Carra S; Poletti A; Kaganovich D.; Aguzzi A.; Sternecker J.; Dantuma N.
5. **Telethon Research Grant** (Nov. 2015-Jan. 2018); PI : Carra S
6. **Cariplo research grant** (May 2015- April 2018); PI: Poletti A.; partners: Carra S; Biciato S.; Quattrone A.; Provenzano A.
7. **AriSLA Research Grant** (April 2015- March 2018); PI: Carra S; partners: Poletti A., Mandrioli J., Cereda C.
8. **Ministero della Salute**, Bando 2011-2012, Progetti di Ricerca Giovani Ricercatori (November 2014- November 2017); PI: Crippa V.; partner: Carra S.