

## **Rodolfo Costa** **CV summary**

Place and date of birth: Canove di Roana (Vicenza), Italy, January 19, 1949  
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### ***Affiliation***

Department of Biology, University of Padova, Via U. Bassi 58/B I-35121 Padova, Italy

### ***Education and Training***

1973: Laurea in Biology from the University of Padova

### ***Appointments***

1997-present Full Professor of Genetics, University of Padova  
1994-1996 Full Professor of Genetics, University of Lecce (Italy)  
1989-1990 Visiting Professor – University of Leicester (U.K.)  
1982-1993 Associate Professor of Genetics, University of Padova  
1978-1982 Assistant Professor of Biology, University of Padova  
1975-1977 Research Assistant in Genetics, University of Padova

### ***Teaching activity***

RC teaches Advanced Genetics (Genetica II) for the Degree in Molecular Biology and Neurobiology for the Master Degree in Molecular Biology. In the Medical School, he teaches Genetics to students of the “Scuola di Specialità in Anatomia Patologica”.

### ***Scientific interests***

RC is currently Professor of Genetics at the University of Padova, Department of Biology. He has spent long periods of time working in European Institutions with grants from EMBO, NATO, SERC, CNR and British Council. Since many years the research activity has concentrated in particular on the neurogenetic analysis of behaviour in the model organism *Drosophila melanogaster*. He has been particularly involved in studying a complex behaviour, the circadian rhythmicity controlled by the circadian clock, in insects and in particular in the fruitfly. He leads a group which is interested in genes that regulate the endogenous clock and study them by characterizing their function, by examining their evolution and their expression. The group is also engaged in understanding how clock neurons are organised and modulate circadian rhythmicity. The Costa lab has recently contributed to the genomic and circadian analysis of the Antarctic krill *Euphausia superba*. The research activity has been developed also in the field of functional genomics, using *Drosophila* as a model organism to study orthologs of as yet uncharacterized human genes, in particular those involved in mitochondrial diseases. Rodolfo Costa collaborates with other groups both within and outside Italy, in particular with Charlotte H. Foerster at the University of Wuerzburg (Germany), Charalambos P. Kyriacou at the University of Leicester (UK), Bettina Meyer at the Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung (AWI), Bremerhaven (Germany), Massimo Zeviani at the MRC Mitochondrial Biology Unit, Cambridge (U.K.), Daniele Ghezzi at the Besta Institute (Milano) and Paolo Bernardi at the University of Padova.

### ***Research projects and grants***

The experimental work has been financed, among other Institutions, by the European

Community (Science Plan - EC Biotechnology programme; VI Framework - Project EUCLOCK; the INsecTIME - Marie Curie ITN and the Cinchon - Marie Curie ITN), MURST/MIUR (Ministero per l'Università e la Ricerca - PRIN), MIPA (Ministero per le Politiche Agricole), ASI (Agenzia Spaziale Italiana), CNR (Epigenomics Flagship Project), Fondazione Cassa di Risparmio di Padova e Rovigo - Progetti d'eccellenza, Fondazione Cassa di Risparmio Provincie Lombarde, Helmholtz Centre for Environmental Research UFZ (Germany), University of Padova - Progetti Strategici; AIRC (Italian Association on Cancer Research) and Telethon - Italy.

### **Institutional responsibilities and Honors**

2018-present Chief-Editor di *Frontiers in Physiology* – Section Chronobiology  
2017-present Member of the Committee for the Quality of Research of the University of Padova  
2017-present Member of the Research Observatory Committee of the University of Padova  
2016-present Member of the National Committee for the qualification (habilitation) in the Scientific Sector 05/I1-Genetics  
2015 - 2017 Member of the Board of Directors of the Italian Federation of Life Sciences (FISV)  
2015 - 2017 President of the Italian Association of Genetics (AGI)  
2013 - 2016 Member of the Scientific Committee of the University of Padova  
from 2011 Socio Corrispondente Istituto Veneto di Scienze, Lettere ed Arti, Venezia  
from 2011 Socio Ordinario Accademia Olimpica, Vicenza  
1999 - 2009 Deputy Dean of the Faculty of Sciences, University of Padova  
2005 - 2008 Member of the Scientific Committee of the University of Padova  
2003 - 2005 President of the Italian Association of Genetics (AGI)  
1999 - 2003 President of the Degree in Biology and in Molecular Biology of the University of Padova  
1990 CNR-Nato Senior Fellowship at the University of Leicester (UK)  
1989 EMBO and SERC Fellowships at the University of Leicester (UK)  
1979 CNR-British Council Fellowship at the University of Swansea (UK)

### **JCR articles, h Index, thesis supervised**

As of May 2018 Prof. Costa published more than 150 full papers on peer-reviewed journals listed on Pubmed (among them: *Nature*, *Science*, *Nature Genetics*, *Nature Neuroscience*, *Proc. Natl. Acad. Sci. U.S.A*, *Cell Metabolism*, *EMBO Reports*, *Current Biology*, *Nucleic Acid Research*, *Scientific Reports*, *J. Biological Rhythms*, *EMBO Molecular Medicine*), 8 book chapters and >150 meeting abstracts.

(Google Scholar: total citations 4036, h-index 37, i10-index 76).

Supervisor/Advisor of 17 PhD students and more than 80 Master Students.

### **Selection of papers (2004-2018)**

1. Andreatta G, Kyriacou CP, Flatt T, **Costa R** (2018) Aminergic Signaling Controls Ovarian Dormancy in *Drosophila*. ***Scientific Reports***, 8: 2030, doi: 10.1038/s41598-018-20407-z.
2. Anduaga AM, Nagy D, **Costa R**, Kyriacou CP. (2018) Diapause in *Drosophila melanogaster* – Photoperiodicity, cold tolerance and metabolites. ***Journal of Insect Physiology***, 105: 46-53. doi: 10.1016/j.jinsphys.2018.01.003.
3. Zonato V, Vanin S, **Costa R**, Tauber E Kyriacou CP. (2018) Inverse European Latitudinal Cline at the *timeless* Locus of *Drosophila melanogaster* Reveals Selection

- on a Clock Gene: Population Genetics of *Is-tim*. **Journal of Biological Rhythms**, 33: 15-23. doi: 10.1177/0748730417742309
4. Nagy D., Andreatta G., Bastianello S., Martin-Anduaga A., Mazzotta G., Kyriacou C.P., **Costa R.** (2018). A semi-natural approach for studying seasonal diapause in *Drosophila melanogaster* reveals robust photoperiodicity. **Journal of Biological Rhythms**, doi: 10.1177/0748730417754116.
  5. Biscontin A., Wallach T., Sales G., Grudziecki A., Janke L., Sartori E., Bertolucci C., Mazzotta G., De Pittà C., Meyer B., Kramer A., **Costa R.** (2017). Functional characterization of the circadian clock in the Antarctic krill, *Euphausia superba*. **Scientific Reports** 7:1 7742. doi: 10.1038/s41598-017-18009-2.
  6. Marini S, Santangeli O, Saarelainen P, Middleton B, Chowdhury N, Skene DJ, **Costa R\***, Porkka-Heiskanen T, Montagnese S. (2017) Abnormalities in the Polysomnographic, Adenosine and Metabolic Response to Sleep Deprivation in an Animal Model of Hyperammonemia. **Frontiers in Physiology** 31;8:636. doi: 10.3389/fphys.2017.00636. (\*corr. author)
  7. Turco M., Biscontin A., Corrias M., Caccin L., Bano M., Chiaromanni F., Salamanca M., Salvo C., Mazzotta G., De Pittà C., Middleton B., Skene D.J., Montagnese S., **Costa R.** (2017) Diurnal preference, mood and the response to morning light in relation to polymorphisms in the human clock gene *PER3*. **Scientific Reports**, 7(1):6967. doi: 10.1038/s41598-017-06769-w
  8. Damulewicz M, Mazzotta GM, Sartori E, Rosato E, **Costa R**, Pyza EM. (2017) Cryptochrome Is a Regulator of Synaptic Plasticity in the Visual System of *Drosophila melanogaster*. **Frontiers in Molecular Neurosciences**. 10:165. doi: 10.3389/fnmol.2017.00165.
  9. Allebrandt K.V., Teder-Laving M., Cusumano P., Frishman G., Rosa Levandovski R., Ruepp A., Hidalgo M.P.L., **Costa R.**, Metspalu A., Roenneberg T., De Pittà C. (2017) Identifying pathways modulating sleep duration: from genomics to transcriptomics. **Scientific Reports**, 7(1):4555. doi: 10.1038/s41598-017-04027-
  10. Sales G., Deagle B.E., Calura E., Martini P., Biscontin A., De Pittà C., Kawaguchi S., Romualdi C., Meyer B\*, **Costa R\***, Jarman S\*. (2017) Krill DB: a *de novo* Transcriptome Database for the Antarctic Krill (*Euphausia superba*). **PLoS One** DOI: 10.1371/journal.pone.0171908. (\*corr. author)
  11. Schiesari L., Andreatta G., Kyriacou C.P., O'Connor M.B., **Costa R\***. (2016) The Insulin-Like Proteins dILPs-2/5 determine diapause Inducibility in *Drosophila*. **PLoS One**, DOI:10.1371/ journal.pone.0163680. (\*corr. author)
  12. Montelli S., Mazzotta G., Vanin S., Caccin L., Corrà S., De Pittà C., Boothroyd, C., Green E.W., Kyriacou C.P., **Costa R.** (2015) *period* and *timeless* mRNA splicing profiles under natural conditions in *Drosophila melanogaster*. **Journal of Biological Rhythms** 30: 217-227.
  13. Green E.W., O'Callaghan E.K., Hansen C.N., Bastianello S., Buthani S., Vanin S., Armstrong J.D., **Costa R.**, Kyriacou C.P. (2015). Genetic analysis of *Drosophila* circadian behavior in seminatural conditions. **Methods in enzymology** 551: 121-133.
  14. Green E.W., O'Callaghan E.K., Pegoraro M., Armstrong J.D., **Costa R.**, Kyriacou C.P. *Drosophila* circadian rhythms in seminatural environments: Summer afternoon component is not an artifact and requires TrpA1 channels. **Proc. Natl. Acad. Sci. U S A** 112: 8702-8707:
  15. Bee L., Nasca A., Zanolini A., Cendron F., d'Adamo P., **Costa R.**, Lamperti C., Celotti L., Ghezzi D., Zeviani M. (2015) A nonsense mutation of human XRCC4 is associated with adult-onset progressive Encephalocardiomyopathy. **EMBO Molecular Medicine** 7:918-29.
  16. Bee L., Marini S., Pontarin G., Ferraro P., **Costa R.**, Albrecht U., Celotti L. (2015).

- Nucleotide excision repair efficiency in quiescent human fibroblasts is modulated by circadian clock. **Nucleic Acids Research** 43: 2126-2137.
17. Mazzotta G., Masiero, Sartori E., Corra' S., Potenza E., **Costa R.**, Tosatto S. (2015). Isoform-specific interactions of the von Hippel-Lindau tumor suppressor protein. **Scientific Reports** 5: 12605.
  18. Turco M., Corrias M., Chiaromanni F., Bano M., Salamanca M., Caccin L., Merkel C., Amodio P., Romualdi C., De Pittà C., **Costa R.**, Montagnese S. (2015). The self-morningness/eveningness (Self-ME): An extremely concise and totally subjective assessment of diurnal preference. **Chronobiology International**, 32: 1192-1200.
  19. Masiero A., Aufiero S., Minervini G., Moro S., **Costa R.**, Tosatto S.C. (2014). Evaluation of the steric impact of flavin adenine dinucleotide in *Drosophila melanogaster* cryptochrome function. **Biochemical Biophysical Research Communications** 450: 1606-1611.
  20. Mazzotta G.M., **Costa R.** (2015). Circadian control of visual plasticity in arthropods. **Ethology Ecology & Evolution**, 28:1-19.
  21. Bano M., Chiaromanni F., Corrias M., Turco M., Rui M., Amodio P., Merkel C., Gatta A., Mazzotta G., **Costa R.**, Montagnese S. (2014). The influence of environmental factors on sleep quality in hospitalized medical patients. **Frontiers in Neurology** 5: 1-8.
  22. Green E.W., O'Callaghan E.K., Pegoraro M., Armstrong J.D., **Costa R.**, Kyriacou C.P. (2014). Genetic analysis of *Drosophila* circadian behavior in seminatural conditions. **Methods in enzymology** 551: 121-133.
  23. Da-Rè C., von Stockum S., Biscontin A., Millino C., Cisotto P., Zordan M.A., Zeviani M., Bernardi P., De Pittà C\*, **Costa R\***. (2014). Leigh Syndrome in *Drosophila melanogaster*: Morphological and Biochemical Characterization of Surf1 Post transcriptional Silencing. **J. Biol. Chem.** 289: 29235-29246. (\*corr. author)
  24. Da-Re C., Franzolin E., Biscontin A., Piazzesi A., Pacchioni B., Gagliani M.C., Mazzotta G., Tacchetti C., Zordan M.A., Zeviani M., Bernardi P., Bianchi V., De Pitta C\*, **Costa R\***. (2014). Functional Characterization of drim2, the *Drosophila melanogaster* Homolog of the Yeast Mitochondrial Deoxynucleotide Transporter. **J. Biol. Chem.** 289: 7448-7459. (\*corr. author)
  25. Da-Ré C., De Pittà C., Zordan M.A., Teza G., Nestola F., Zeviani M., **Costa R\***, Bernardi P\*. (2014). UCP4C mediates uncoupled respiration in larvae of *Drosophila melanogaster*. **EMBO Reports** 5: 586-591. (\*corr. author)
  26. Baggio F., Bozzato A, Benna C., Leonardi E., Romoli O., Cognolato M., Tosatto S.C.E., **Costa R.**, Sandrelli F. (2013). *2mit*, an Intronic Gene of *Drosophila melanogaster timeless2*, Is Involved in Behavioral Plasticity. **PLoS ONE** 8: 1932-6203.
  27. Mazzotta G., Rossi A., Leonardi E., Mason M., Bertolucci C., Caccin L., Spolaore B., Martin A.J., Schlichting M., Grebler R., Helfrich-Förster C., Mammi S., **Costa R.\***, Tosatto S.C. (2013). Fly cryptochrome and the visual system. **Proc. Natl. Acad. Sci. U S A** 110: 6163-6168. (\*corr. author)
  28. Menegazzi P, Vanin S, Yoshii T, Rieger D, Hermann C, Dusik V, Kyriacou CP, Helfrich-Förster C, **Costa R.**(2013). Drosophila clock neurons under natural conditions. **J. Biol. Rhythms** 28: 3-14.
  29. Montagnese S., De Pittà C., De Rui M., Corrias M., Turco M., Merkel C., Amodio P., **Costa R.**, Skene D.J., Gatta A. (2013). Sleep-wake abnormalities in patients with cirrhosis. **Hepatology**. 59: 705-712.
  30. De Pittà C., Biscontin A., Albiero A., Sales G., Millino C., Mazzotta G.M., Bertolucci C., **Costa R.** (2013). The Antarctic Krill *Euphausia superba* Shows Diurnal Cycles of Transcription under Natural Conditions. **PLoS ONE**. 8: 1932-6203.

31. Kauranen H., Menegazzi P., **Costa R.**, Helfrich-Förster C., Kankainen A., Hoikkala A. (2012). Flies in the north: locomotor behavior and clock neuron organization of *Drosophila montana*. **J. Biol. Rhythms** 27: 377-387.
32. Vanin S., Bhutani S., Montelli S., Menegazzi P., Green E.W., Pegoraro M., Sandrelli F., **Costa R.\***, Kyriacou C.P. (2012). Unexpected features of *Drosophila* circadian behavioural rhythms under natural conditions. **Nature** 484: 371-375. (\* corr. author)
33. Schiesari L., Kyriacou C.P., **Costa R.** (2011) The hormonal and circadian basis for insect photoperiodic timing. **FEBS Letters** 585: 1450-1460.
34. Ghezzi D., Arzuffi P., Zordan M.A., Da Re C., Lamperti C., Benna C., D'Adamo P., Diodato D., **Costa R.**, Mariotti C., Uziel G., Smiderle C., Zeviani M. (2011) Mutations in TTC19 cause mitochondrial complex III deficiency and neurological impairment in humans and flies. **Nature Genetics** 43: 259-263.
35. Mazzotta G., De Pittà C., Benna C., Tosatto S., Lanfranchi G., Bertolucci C., **Costa R.** (2010) A cry from the krill. **Chronobiology International** 27:1-21.
36. Benna C., Bonaccorsi S., Wulbeck C., Helfrich-Forster C., Gatti M., Kyriacou C.P., **Costa R.\***, Sandrelli F. (2010). *Drosophila timeless2* is required for chromosome stability and circadian photoreception. **Current Biology** 20: 346-352. (\*corr. author)
37. Fernandez-Ayala D.J.M., Sanz A., Vatriainen S., Kempainen K.K., Babusiak M., Mustalahti E., **Costa R.**, Tuomela T., Zeviani M., Chung J., O'Dell K.M.C., Rustin P., Jacobs H.T. (2009). Expression of the *Ciona intestinalis* Alternative Oxidase (AOX) in *Drosophila* complements defects in mitochondrial oxidative phosphorylation. **Cell Metabolism** 9: 449-460.
38. Yoshii T., Vanin S., **Costa R.**, Helfrich-Forster C. (2009). Synergic entrainment of *Drosophila*'s circadian clock by light and temperature. **Journal of Biological Rhythms** 24: 452-464.
39. Benna C., Peron S., Rizzo G., Faulkner G., Megighian A., Perini G., Tognon G., Valle G., Reggiani C., **Costa R.\***, Zordan M.A. (2009). Post-transcriptional silencing of the *Drosophila* homolog of human ZASP: a molecular and functional analysis. **Cell and Tissue Research** 337: 463-476. (\*corr. author)
40. Sandrelli F., **Costa R.**, Kyriacou C.P., Rosato E. (2008). Comparative analysis of circadian clock genes in insects. **Insect Molecular Biology** 17: 447-463.
41. Cruciani F., Trombetta B., Labuda D., Modiano D., Torroni A., **Costa R.**, Scozzari R. (2008). Genetic diversity patterns in the human clock gene *period2* are suggestive of population-specific positive selection. **European Journal of Human Genetics** 16: 1526-1534.
42. Kyriacou C.P., Peixoto, A.A., Sandrelli, F., **Costa R.**, Tauber, E. (2008). Clines in clock genes. **Trends in Genetics** 24: 124-132.
43. Codd V., Dolezel D., Piccin A., Garner K.J., Racey S.N., Straatman K.R., Louis E.J., **Costa R.**, Sauman I., Kyriacou C.P. & Rosato E. (2008). Circadian rhythm gene regulation in the housefly, *Musca domestica*. **Genetics** 177: 1539-1551.
44. De Pittà C., Bertolucci C., Mazzotta M.G., Bernante F., Rizzo G., De Nardi B., Pallavicini A., Lanfranchi G. & **Costa R.** (2008). Systematic sequencing of mRNA from the Antarctic krill (*Euphausia superba*) and first tissue specific transcriptional signature. **BMC Genomics** 9: 45 (Epub).
45. Specchia V., Benna C., Mazzotta G.M., Piccin A., Zordan M.A., **Costa R.**, Bozzetti M.P. (2007). *Aubergine* gene overexpression in somatic tissues of *aubergine-sting* mutants interferes with the RNAi pathway of a *yellow* hairpin dsRNA in *Drosophila melanogaster*. **Genetics** 178: 1271-1282.
46. Tauber E., Zordan M., Sandrelli F., Pegoraro M., Osterwalder N., Breda C., Daga A., Selmin A., Monger K., Benna C., Rosato E., Kyriacou C.P., **Costa R.** (2007). Natural selection favors a newly derived *timeless* allele in *Drosophila melanogaster*. **Science**

316: 1895-1898.

47. Sandrelli F., Tauber E., Pegoraro M., Mazzotta G., Cisotto P., Landskron J., Stanewsky R., Piccin A., Rosato E., Zordan M., **Costa R.**, Kyriacou C.P. (2007). A molecular basis for natural selection at the *timeless* locus in *Drosophila melanogaster*. **Science** 316: 1898-1900.
48. Hemsley M.J., Mazzotta G.M., Mason M., Dissel S., Toppo S., Pagano M.A., Sandrelli F., Meggio F., Rosato E., **Costa R.** & Tosatto S.C. (2007). Linear motifs in the C-terminus of *D. melanogaster cryptochrome*. **Biochem. Biophys. Res. Commun.** 355: 531-537 (\*corr. author)
49. Kyriacou C.P., Peixoto A.A. & **Costa R.** (2007). A cline in the *Drosophila melanogaster period* gene in Australia: neither down nor under. **J. Evol. Biol.** 20: 1649-1651
50. Sandrelli F., Cappelozza S., Benna C., Saviane A., Mastella A., Mazzotta G.M., Moreau S., Pegoraro M., Piccin A., Zordan M.A., Cappelozza L., Kyriacou C.P., **Costa R.** (2007) Phenotypic effects induced by knock-down of the *period* clock gene in *Bombyx mori*. **Genetical Res.** 89: 73-84.
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55. Mocellin S., **Costa R.**, Nitti D. (2005). RNA interference: ready to silence cancer? **Journal of Molecular Medicine** 84: 4-15.
56. Mazzotta G.A., Sandrelli F., Zordan M.A., Mason M., Benna C., Cisotto P., Rosato E., Kyriacou C.P., **Costa R.** (2005). The clock gene *period* in the medfly *Ceratitis capitata*. **Genetical Research Cambridge**, 85: 1-18.
57. Dissel S., Codd V., Fedic R., Garner K.J., **Costa R.**, Kyriacou C.P., Rosato E. (2004). A constitutively active cryptochrome in *Drosophila melanogaster*. **Nature Neurosci.** 7: 834-840.
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