

## Paola Oliveri, PhD

### Current Affiliation

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### Current Position

Associate Professor in Genetics and Evolution

### Education and academic career

Institute and Location	Degree/Position	Year	Field of Study
University College London, London, UK	Associate Professor in Genetic and Evolution	2018-present	Evolution of development and regeneration
University College London, London, UK	Senior Lecturer in Genetic and Evolution	2008-2018	Evolution of development and regeneration
California Institute of Technology, Pasadena, CA, USA	Member of Professional Staff	2004-2007	Systems Biology of embryonic development
California Institute of Technology, Pasadena, CA, USA	Senior Research Fellow	2003-2004	Molecular and developmental biology
California Institute of Technology, Pasadena, CA, USA	Postdoctoral Research Fellow	2000-2003	Sea Urchin developmental biology
California Institute of Technology, Pasadena, CA, USA	Associate Researcher of Stowers Institute	1998-2000	Sea Urchin developmental biology
University of Palermo, Italy	PhD, <i>Optimum</i>	1998	Cell and Developmental biology
University of Palermo, Italy	Habilitation of Clinical Biology <sup>1</sup> 135/150	1993	Microbiology and analytical biology
University of Palermo, Italy	BS, <i>Maxima cum laude</i>	1992	Biology

1) This is a degree required to work as analytical biologist and/or microbiologist in Italian hospitals.

### Research Interests

Dr. Paola Oliveri, trained as cell and developmental biologist, is a molecular developmental biologist interest in evolution of the genetic program underlying the specification and identity of cell types. She uses a system level approach to study how the genome encodes for different aspects of embryonic development and adult regeneration. In her lab, functional genomics, molecular embryology and logical modeling are combined to study the specification of neurosensory cells and skeletal mesoderm during development and regeneration in echinoderms

**Teaching/Education**

- Teacher in the following undergraduate courses at UCL: BIOL0012 Animal Forms and Function, BIOL0013 Biology of Development, CELL0002 Mechanism of Development, BIOL0025 Advance Molecular Biology - Genome and Evolution. (2008-Present).
- Degree Tutor of Biology Generalist and Cell Biology degree at UCL (2008-Present).
- Instructor of the MBL Embryology Summer Course, Woods Hole, MA, USA (2006, 2007 and 2008), and EMBO MAMED course Kristineberg, Sweden (2013).
- Instructor of the MBL GRN Summer Course, Woods Hole, MA, USA (2009).
- Instructor of the 1<sup>st</sup> International Summer School: An integrated approach to marine invertebrate biodiversity: evolutionary and functional adaptations, Tricase, Lecce, Italy (2018).
- Supervisor of more than 40 undergraduate students (University of Palermo, Caltech, UCL), 18 graduate students (Caltech, UCL) 5 postdoc (Caltech, UCL) and 5 technicians (Caltech, UCL).
- Member of several national and international PhD examination panels.

**Other Professional Experiences**

- Guest editor for the special issue “Systems Biology – Genetic Networks”, published in BBA gene structure and expression in 2009.
- Official Reviewer for several international journals, such as BMC Genomics, Development, Developmental Biology, Mechanism of Development, PNAS, PloS Biology, Marine Genomics, EvoDevo, Scientific Reports, Nature, EvoDevo, BMC Biology.
- Co-organizer of several international conferences
- Promoter and organizer of the London Echinoderm Network.
- Invited speaker in many international conferences and seminars series (detailed list available upon request).

*Author of 50 papers on international referenced (ISI) journals and 2 book chapters with 6988 citations (Google Scholar January 2019, of which 2761 since 2014) h-index of 30; i10-index of 40.*

## Publications

1. Arnone MI, **Oliveri P**, Martinez P.A conceptual history of the "regulatory genome": From Theodor Boveri to Eric Davidson. (2018) *Mar Genomics*. 2018 Nov 27. pii: S1874-7787(18)30196-X. doi: 10.1016/j.margen.2018.11.003.
2. Perillo M., Paganos P., Mattiello T., Cocurullo M., **Oliveri P**. and Arnone M.I. (2018) "New Neuronal Subtypes With a "Pre-Pancreatic" Signature in the Sea Urchin *Strongylocentrotus purpuratus*" *Frontiers in Endocrinology*, 9, 61–13. <http://doi.org/10.3389/fendo.2018.00628>
3. Wood, N. J., Mattiello, T., Rowe, M. L., Ward, L., Perillo, M., Arnone, M. I., Elphick M.R. and **Oliveri P**. (2018). Neuropeptidergic Systems in Pluteus Larvae of the Sea Urchin *Strongylocentrotus purpuratus*: Neurochemical Complexity in a "Simple" Nervous System. *Frontiers in Endocrinology*, 9, 61–13. <http://doi.org/10.3389/fendo.2018.00628>
4. Pinato DJ, Kythreotou A, Mauri FA, Suardi E, Allara E, Shiner RJ, Akarca AU, Trivedi P, Gupta N, Dalla Pria A, Marafioti T, **Oliveri P**, Newsom-Davis T, Bower M (2018) "Functional immune characterization of HIV-associated non-small-cell lung cancer" *Ann Oncol*. 2018 Jun 1;29(6):1486-1488. doi: 10.1093/annonc/mdy125
5. Ben Khadra Y., Sugni M., Ferrario C., Bonasoro F., **Oliveri P**., Martinez P, Candia Carnevali M.D. (2018) "Regeneration in Stellate Echinoderms: Crinoidea, Asteroidea and Ophiuroidea". *Results Probl Cell Differ*. 2018;65:285-320. doi: 10.1007/978-3-319-92486-1\_14. Book Chapter
6. Dylus DV, Czarkwiani A, Blowes LM, Elphick MR, **Oliveri P**. (2018) "Developmental transcriptomics of the brittle star *Amphiura filiformis* reveals gene regulatory network rewiring in echinoderm larval skeleton evolution." *Genome Biol*. 2018 Feb 28;19(1):26. doi: 10.1186/s13059-018-1402-8.
7. Ferrario C, Ben Khadra Y, Czarkwiani A, Zakrzewski A, Martinez P, Colombo G, Bonasoro F, Candia Carnevali MD, **Oliveri P**, Sugni M. (2018) "Fundamental aspects of arm repair phase in two echinoderm models." *Dev Biol*. 2018 Jan 15;433(2):297-309. doi:10.1016/j.ydbio.2017.09.035.
8. Valero-Gracia A., Petrone L., **Oliveri P**., Nilsson D.E., Arnone M.I. (2016) "Non-directional photoreceptors in the pluteus of *Strongylocentrotus purpuratus*" *Front. Ecol. Evol*. Nov 2016 doi: 10.3389/fevo.2016.00127
9. Czarkwiani A, Ferrario C, Dylus DV, Sugni M, **Oliveri P**. (2016) "Skeletal regeneration in the brittle star *Amphiura filiformis*." *Front Zool*. 2016 Apr 22;13:18. doi: 10.1186/s12983-016-0149-x.
10. Dylus DV, Czarkwiani A, Stångberg J, Ortega-Martinez O, Dupont S, **Oliveri P**. (2016) "Large-scale gene expression study in the ophiuroid *Amphiura filiformis* provides insights into evolution of gene regulatory networks." *Evodevo*. 2016 Jan 11;7:2. doi: 10.1186/s13227-015-0039-x.
11. Pauls S, Goode DK, Petrone L, **Oliveri P**, Elgar G. (2015) "Evolution of lineage-specific functions in ancient cis-regulatory modules." *Open Biol*. 2015 Nov;5(11). pii: 150079. doi: 10.1098/rsob.150079.
12. Semmens DC, Beets I, Rowe ML, Blowes LM, **Oliveri P**, Elphick MR. (2015) Discovery of sea urchin NGFFamide receptor unites a bilaterian neuropeptide family. *Open Biol*. 5(4):150030. doi: 10.1098/rsob.150030.
13. Saina M, Busengdal H, Sinigaglia C, Petrone L, **Oliveri P**, Rentzsch F, Benton R (2015) "A cnidarian homologue of an insect gustatory receptor functions in developmental body patterning." *Nat Commun*. 2015 Feb 18;6:6243. doi: 10.1038/ncomms7243.
14. Love NR, Pollak N, Dölle C, Niere M, Chen Y, **Oliveri P**, Amaya E, Patel S, Ziegler M. (2015) "NAD kinase controls animal NADP biosynthesis and is modulated via evolutionarily divergent calmodulin-dependent mechanisms." *Proc Natl Acad Sci U S A*. 2015 Jan 20
15. Sinigaglia C, Busengdal H, Lerner A, **Oliveri P**, Rentzsch F. (2015) "Molecular characterization of the apical organ of the anthozoan *Nematostella vectensis*." *Dev Biol*. 2015 Feb 1;398(1):120-33.

16. Telford M J, Lowe C J, Cameron C B., Ortega-Martinez O, Aronowicz J, **Oliveri P**, Copley R R. (2014) "Phylogenomic analysis of echinoderm class relationships supports Asterozoa" *Proc. R. Soc. B* Jul 7;281(1786)
17. **Oliveri P**, Fortunato AE, Petrone L, Ishikawa-Fujiwara T, Kobayashi Y, Todo T, Antonova O, Arboleda E, Zantke J, Tessmar-Raible K, Falciatore A. (2014) "The Cryptochrome/Photolyase Family in aquatic organisms." *Mar Genomics*. pii: S1874-7787(14)00022-1.
18. Andrikou C, Iovene E, Rizzo F, **Oliveri P**, Arnone MI. (2013) "Myogenesis in the sea urchin embryo: the molecular fingerprint of the myoblast precursors." *Evodevo*. 4(1):33.
19. Czarkwiani A, Dylus DV, **Oliveri P**. (2013) "Expression of skeletogenic genes during arm regeneration in the brittle star *Amphiura filiformis*." *Gene Expr Patterns*. 13(8):464-72.
20. Solek CM, **Oliveri P**, Loza-Coll M, Schrankel CS, Ho EC, Wang G, Rast JP. (2013) "An ancient role for Gata-1/2/3 and Scl transcription factor homologs in the development of immunocytes." *Dev Biol*. 382(1):280-92.
21. Wahl M.E., Hahn J., Gora K., Davidson E.H., **Oliveri P**. (2009) "The cis-regulatory system of the tbrain gene: Alternative use of multiple modules to promote skeletogenic expression in the sea urchin embryo." *Dev. Biol*. 15(2):428-41
22. Materna S.C., **Oliveri P**. (2008) "A protocol for unraveling gene regulatory networks." *Nat. Protoc.*; 3(12):1876-87.
23. **Oliveri P**, Tu Q., Davidson E.H. (2008) "Global regulatory logic for specification of an embryonic cell lineage." *Proc. Natl. Acad. Sci. USA* 105(16):5955-62.
24. Geiss G.K., Bumgarner R.E., Birditt B., Dahl T., Dowidar N., Dunaway D.L., Fell H.P., Ferree S., George R.D., Grogan T., James J.J., Maysuria M., Mitton J.D., **Oliveri P**, Osborn J.L., Peng T., Ratcliffe A.L., Webster P.J., Davidson E.H., Hood L. (2008) "Direct multiplexed measurement of gene expression with color-coded probe pairs." *Nat. Biotechnol*. 26(3):317-25.
25. Voronina E., Lopez M., Juliano C.E., Gustafson E., Song J.L., Extavour C., George S., **Oliveri P**, McClay D., Wessel G. (2008) "Vasa protein expression is restricted to the small micromeres of the sea urchin, but is inducible in other lineages early in development." *Dev. Biol*. 314(2):276-86.
26. Revilla-I-Domingo R, **Oliveri P**, and Davidson E.H. (2007) "A missing link in the sea urchin embryo gene regulatory network: hesC and the double-negative specification of micromeres". *Proc. Natl. Acad. Sci. USA*. 104(30):12383-8.
27. **Oliveri P** and Davidson E.H. (2007) "Built to Run, Not Fail". *Science* 315:1520-1511
28. Howard-Ashby M. L., Materna S., Brown C. T., Tu Q., **Oliveri P**, Cameron R.A. and Davidson, E. H. (2006). "High regulatory gene use in sea urchin embryogenesis: Implications for bilaterian development and evolution". *Dev. Biol*. 300:27-34
29. Tu Q., Brown C. T., Davidson E. H. and **Oliveri P**. (2006) "Sea Urchin Forkhead Gene Family: Phylogeny and Embryo Expression". *Dev. Biol*. 300:49-62
30. The Sea Urchin Genome Sequencing Consortium (2006) "The Genome of the Sea Urchin *Strongylocentrotus purpuratus*". *Science* 314(5801):941-52.
31. **Oliveri P**, Walton K., Davidson E. and McClay D.R.# (2006) "Repression of Mesodermal Fate by *foxa*, a Key Endoderm Regulator of the Sea Urchin Embryo". *Development*. 133(21):4173-81
32. Dornbos, S.Q., Bottjer, D.J., Chen, J.Y., Gao, F., **Oliveri, P.**, and Li, C.W. (2006) "Environmental controls on the taphonomy of phosphatized animals and animal embryos from the Neoproterozoic Doushantuo Formation, southwest China". *Palaeos*, 21(1): 3-14.
33. Dornbos, S.Q., Bottjer, D.J., Chen, J.Y., **Oliveri, P.**, Gao, F., and Li, C.W. (2005) "Precambrian animal life: Taphonomy of phosphatized metazoan embryos from southwest China". *Lethaia*, 38 (2):101-109.
34. **Oliveri P**, and Davidson E.H. (2004) "Gene Regulatory Analysis in Sea Urchin Embryos". *Methods Cell Biol*. 74:775-94.
35. Chen J.Y., Bottjer D.J., **Oliveri P**, Dornbos S.Q., Gao F., Ruffins S., Chi H., Li C.W., Davidson E.H. (2004) "Small Bilaterian Fossils from 40-55 Million Years Before the Cambrian". *Science* 305:218-222.

36. **Oliveri P.**, and Davidson E.H. (2004) "Gene regulatory network controlling embryonic specification in the sea urchin". *Curr. Opin. Gen. Dev.* 14:351-360.
37. Takacs C.M., Amore G., **Oliveri P.**, Wang D., Burke R.D., and Peterson K.J. (2004): "Expression of an NK2 homeodomain gene in the apical ectoderm defines a new territory in the early sea urchin embryo." *Dev. Biol.* 269(1):152-64.
38. Cameron R.A.\*, **Oliveri P.\***, Wyllie J.A., and Davidson E.H. (2004): "cis-Regulatory Activity of Randomly Chosen Genomic Fragments from the Sea Urchin". *Gen. Exp. Patterns (Mech. Dev.)* 4(2): 205-213. (\*) These authors contributed equally to this work.
39. Etensohn C.A., Illies M.R., **Oliveri P.**, and DeJong D. (2003) "Alx1, a member of the Cart1/Alx3/Alx4 subfamily of paired-class homeodomain proteins, is an essential component of the gene network controlling skeletogenic fate specification in the sea urchin embryo". *Development* 130: 2917-2928.
40. **Oliveri P.**, Davidson E.H., McClay D.R. (2003): "Activation of *pmar1* controls specification of micromeres in the sea urchin embryo". *Dev. Biol.* 258: 32-43. Cover image
41. Dmochowski I.J., Dmochowski J.E., **Oliveri P.**, Davidson E.H. and Fraser S.E. (2002): "Quantitative imaging of cis-regulatory reporters in living embryos". *Proc. Natl. Acad. Sci. U S A.* 99(20):12895-900.
42. Chen J.Y., **Oliveri P.**, Gao F., Dornbos S.Q., Li C.W., Bottjer D.J. and Davidson E.H. (2002): "Precambrian animal life: probable developmental and adult cnidarian forms from Southwest China". *Dev. Biol.* 248(1):182-96.
43. **Oliveri P.**, Carrick D.M. and Davidson E.H. (2002): "A regulatory gene network that directs micromere specification in the sea urchin embryo". *Dev. Biol.* 246(1):209-28.
44. Davidson E.H., Rast J.P., **Oliveri P.**, Ransick A., Calestani C., Yuh C.H., Minokawa T., Amore G., Hinman V., Arenas-Mena C., Otim O., Brown C.T., Livi C.B., Lee P.Y., Revilla R., Schilstra M.J., Clarke P.J., Rust A.G., Pan Z., Arnone M.I., Rowen L., Cameron R.A., McClay D.R., Hood L. and Bolouri H. (2002): "A provisional regulatory gene network for specification of endomesoderm in the sea urchin embryo". *Dev. Biol.* 246(1):162-90.
45. Davidson E.H., Rast J.P., **Oliveri P.**, Ransick A., Calestani C., Yuh C.H., Minokawa T., Amore G., Hinman V., Arenas-Mena C., Otim O., Brown C.T., Livi C.B., Lee P.Y., Revilla R., Rust A.G., Pan Z., Schilstra M.J., Clarke P.J., Arnone M.I., Rowen L., Cameron R.A., McClay D.R., Hood L. and Bolouri H. (2002): "A genomic regulatory network for development". *Science* 295:1669-78.
46. Di Bernardo M., Bellomonte D., Castagnetti S., Melfi R., **Oliveri P.** and Spinelli G. (2000): "Homeobox Genes and Sea Urchin Development". *Int. J. Dev. Biol.* 44: 637-643.
47. Chen J., **Oliveri P.**, Li C., Zhou G., Gao F., Hagadorn J.W., Peterson K.J. and Davidson E.H. (2000): "Precambrian animal diversity: putative phosphatized embryos from the Doushantuo formation of China". *Proc. Natl. Acad. Sci. U S A*, 97(9): 4457-62.
48. Rast J.P., **Oliveri P.** and Davidson E.H. (2000). Conserved linkage among sea urchin homologs of genes encoded in the vertebrates MHC region. In *The Major Histocompatibility Complex: Evolution, Structure and Function*. M. Kasahara, ed. Springer-Verlag, Tokyo. Pp. 66-74.
49. Di Bernardo M., Castagnetti S., Bellomonte D., **Oliveri P.**, Melfi R., Palla F. and Spinelli G. (1999): "Spatially restricted expression of *PIOtp*, a *Paracentrotus lividus* orthopedia-related homeobox gene, is correlated with oral ectodermal patterning and skeletal morphogenesis in late-cleavage sea urchin embryos". *Development* 126(10): 2171-9.
50. Spinelli G., Di Bernardo M., Palla F., Anello L., **Oliveri P.**, Melfi R., Bonura C., Russo R. and DiGaetano L. (1997): "Gene expression during early embryogenesis of sea urchin: The histone and homeobox genes". *Invert. Repro. Dev.* 31(1-3): 11-19
51. Di Bernardo M., Russo R., **Oliveri P.**, Melfi R. and Spinelli G. (1995): "Homeobox-containing gene transiently expressed in a spatially restricted pattern in the early sea urchin embryo". *Proc. Natl. Acad. Sci. U S A* 92(18):8180-4.
52. Di Bernardo M., Russo R., **Oliveri P.**, Melfi R. and Spinelli G. (1994): "Expression of homeobox-containing genes in the sea urchin (*Paracentrotus lividus*) embryo". *Genetica*; 94(2-3):141-50.