

BIOGRAPHICAL SKETCH

Claude DESPLAN		Silver Professor of Biology & Neuroscience	
INSTITUTION AND LOCATION	DEGREE	Year	FIELD OF STUDY
Ecole Normale Supérieure, St. Cloud, France	Master/Agrégation	1975	Biology
Université Paris VII	PhD	1979	Biochemistry
Université Paris VII	D.Sc.	1983	Molecular Biology
University of California, San Francisco	Postdoc	1984-87	Molecular Genetics

A. Personal Statement

I have been in science for four decades and my enthusiasm is still as fresh as the first day. Over the years, my laboratory has switched from *in vitro* molecular biology and protein structure to developmental neurobiology and electrophysiology. We have managed to make significant contributions to all of these fields, in large part, because of the quality of the people I attract to the lab, the best PhD students in our program and exceptional postdocs from all over the world. PhD students and post-docs join my lab because of our excellent scientific output, as well as the very interactive and friendly atmosphere in the lab and the department. Most of my previous PhDs and postdocs have continued on to have brilliant academic careers and remain in close contact with me. I also take my mission as an educator and mentor very seriously, not only for the scientists in my lab but also for the undergraduates at NYU. I teach or have taught the two largest classes of Biology, freshman Principles of Biology and sophomore Molecular and Cell biology II. I believe that I manage to convey the message of science with enthusiasm and passion, and was honored with a teaching award from NYU and with the Conklin Medal from the Society for Developmental Biology in recognition for my mentoring. Many of my undergrads also join the lab as researchers and have coauthored numerous scientific articles (I have nearly a dozen undergrad researchers in the lab every year, and all obtain University funding for their research!). I am also dedicated to serving the community by organizing many meetings and by serving as an editor for several important journals where I try to promote creative science.

B. Positions and Honors.

Professional Experience

1972-75: **Elève Professeur**, Ecole Normale Supérieure, Saint Cloud, France.
 1975-78: **Assistant**, Biophysics, School of Medicine, Hôpital Saint Antoine, University of Paris VI.
 1978-81: **Assistant**, Biochemistry, Ecole Normale Supérieure, Fontenay aux Roses, France.
 1981-84: **Maitre de Conférence**, Biochemistry, ENS Fontenay aux Roses, France.
 1984-87: **Postdoctoral Fellow**, Department of Biochemistry, U.C.S.F., San Francisco.
 1987-92: **Assistant Professor** & Assistant Investigator, HHMI, The Rockefeller University, NY.
 1992-99: **Associate Professor** & Associate Investigator, HHMI, The Rockefeller University, NY.
 1999-present: **Silver Professor**, Dept. Biology, New York University; **Director**, Center for Developmental Genetics; **Affiliate Member**, Center for Neural Science, NYU; **Member**, Neuroscience Institute NYU.

Honors:

2025: Joram Piatigorsky Basic Science Award, National Eye Institute NIH
2020: Edwin G. Conklin Medal - Society for Developmental Biology
2018: Elected Member of the US National Academy of Sciences
2016: Grand Prix Charles-Mayer, French Academy of Sciences
2014: "Golden Dozen" Teaching Award, NYU
2008: Elected Associate Member of EMBO
2007: Elected Fellow of the New York Academy of Sciences
2007: Elected Member of the AAAS
2006: Sokol Award for the Sciences, NYU
2004: Silver Professor, NYU
1987: Andre Meyer Fellow, Rockefeller University.
1986-87: EMBO Postdoctoral Fellowship
1984-85: Fogarty Postdoctoral Fellowship
1984: Fellowship from the Association pour la Recherche sur le Cancer
1983: Fellowship, Fondation Simone et Cino Del Duca Award

1975: "Agrégation" Physiology & Biochemistry
1972: Admission at "Ecole Normale Supérieure de Saint Cloud", France

External Referee:

NIH Dev-2 Study Section (2007, permanent member 2009-2013, *ad hoc* since)
NIH "BDPE/VIS-C" (permanent member, 1999-2004), Ad hoc since
NIH "Molecular Biology" Study Section (Ad Hoc member, 1995, 1998);
NIH "Cell Biology" (MDCN-4) Study Sections (Ad Hoc member, 1999) .
NSF "Developmental Mechanisms", 1995-2008.
CNRS ATIP "Developmental and Cellular Biology" (1992-2009).
NIH Laboratory of Molecular Genetics, NICHD, Site Visit (1995, 1997, 2007, 2015).

The Wellcome Trust.

Damon Runyon, Scientific Advisory Committee, 2002-2007.

Fullbright committee (2007)

Pew National Advisory Committee (2012-2019)

Scientific Advisory Boards: EMBL, Heidelberg (2015); Blavatnik National Committee (2012-present; chair in 2015); VIB Leuven, Belgium (2015, 2018); Johns Hopkins (2014); NIH: National Eye Institute, (2014); NeuroPsy Paris-Saclay Institute (2013, 2018, Chair in 2022, 2023); Center for Developmental Biology, Toulouse (2013); Institut Jacques Monod, Paris (2012); Champalimaud Lisbon (2012); CABD, Sevilla (2011, 2018); NYU Abu Dhabi Institute Advisory Committee (2010-2012); Institut Curie, Paris (2011, 2018). U. Utah (2023)

Journal Editorial Boards:

- Editor:	<u>Science</u>	Board of Reviewing Editors.
	eLife	Senior Editor
	<u>PLoS Biology</u>	Academic Editor
	<u>Frontiers Neuroscience</u>	Associate Editor

- Editorial boards: Genes & Development, Development, EMBO Reports, BMC Dev. Biol., Open Biology.

Reviewer: Nature & Nature family, Cell and Cell press journals, Science, Neuron, PLOS journals, Genes & Development, Current Biology, Development, EMBO J., Mol. Cell. Biol., PNAS, Dev. Biol., J. Neuro., Mech. of Dev., J. Mol. Biol., J. Biol. Chem., Genomics, Trends In Genetics, etc.

C. Selection of publications:

1) Treisman J., Gönczy P., Vashishta M., Harris E., **Desplan C.**

A single amino acid can determine the DNA binding specificity of homeodomain proteins.

Cell, **59**, 563-562 (1989).

2) Treisman J., **Desplan C.** The *Drosophila* developmental gene products hunchback and Krüppel bind to the promoters of *hunchback*.

Nature, **341**, 335-337 (1989).

3) Ohkuma Y., Horikoshi M., Roeder R., **Desplan C.** Binding site-dependent direct activation and repression of *in vitro* transcription by *Drosophila* homeodomain proteins.

Cell, **61**, 475-484 (1990).

4) Ronchi E, Treisman J., Dostatni N., Struhl G. & **Desplan C.** Down-regulation of the *Drosophila* morphogen Bicoid by the Torso receptor mediated signal transduction cascade.

Cell, **74**, 347-355 (1993).

5) Simpson-Brose M, Treisman J. & **Desplan C.**

Synergy between the Hunchback and Bicoid morphogens is required for anterior patterning in *Drosophila*.

Cell, **78**, 855-865 (1994).

6) Wimmer E., Carleton A., Harjes P., Turner T. & **Desplan C.**

bicoid-independent formation of thoracic segments in *Drosophila*.

Science, **287**, 2476-2479 (2000).

7) Mollereau B., Dominguez M., Webel R., Colley N., Keung B., de Celis J., & **Desplan C.**

Two-step process for photoreceptor formation in *Drosophila*.

Nature, **412**, 911-913 (2001).

- 8) Wernet M., Labhart T., Baumann F., Mazzone E., Pichaud F. & **Desplan C.**
homothorax switches function of *Drosophila* photoreceptors from color to polarized light sensors.
Cell, **115**, 267-279 (2003).
- 9) Mikeladze-Dvali T., Wernet M., Pistillo D., Mazzone E., Teleman A., Chen Y., Cohen S. & **Desplan C.**
The growth regulators Warts/Lats and Melted interact in a bistable loop to specify opposite fates in *Drosophila* R8 photoreceptors.
Cell, **122**, 775-787 (2005).
- 10) Wernet M. F., Mazzone E. O., Çelik A., Duncan D. M., Duncan I. & **Desplan C.**
Stochastic *spineless* expression creates the retinal mosaic for color vision.
Nature, **440**, 174-180 (2006). Article.
- 11) Lynch J.A., Brent A.E., Leaf D.S., Pultz M.A. & **Desplan C.**
Localized maternal *orthodenticle* patterns anterior and posterior in the long germ wasp *Nasonia*.
Nature, **439**, 728-732 (2006).
- 12) Brent A.E., Yucel G., Small S. & **Desplan C.**
Permissive and instructive anterior patterning functions rely on mRNA localization in the wasp embryo.
Science, **315**, 1841-1843 (2007).
- 13) Losick R. & **Desplan C.** Stochastic choices and cell fate.
Science **320**, 65-68 (2008)
- 14) Sprecher, S. & **Desplan C.**
Switch of *rhodopsin* expression in terminally differentiated *Drosophila* sensory neurons.
Nature **454**, 533-537 (2008). [PMCID: PMC2750042](#)
- 15) Johnston R.J.Jr., Otake Y., Sood P., Vogt N., Behnia R., Vasiliauskas D., McDonald E., Xie B., Koenig S., Wolf R., Cook T., Gebelein B., Kussell E., Nagakoshi H. & **Desplan C.**
Interlocked feedforward loops control cell-type-specific Rhodopsin expression in the *Drosophila* eye,
Cell **145**, 956-968 (2011). [PMCID: PMC3117217](#)
- 16) Vasiliauskas D., Mazzone E., Johnston R., Sprecher S., Vogt N., Lidder P. & **Desplan C.**
Feedback from rhodopsin controls *rhodopsin* exclusion in *Drosophila* photoreceptors.
Nature **79**, 108-12 (2011). [PMCID: PMC3208777](#)
- 17) Li X., Erclik T., Bertet C., Chen Z., Voutev R., Venkatesh S., Morante J., Celik A., **Desplan C.**
Temporal patterning of *Drosophila* medulla neuroblasts controls neural fates.
Nature **498**, 456-62 (2013). Article. [PMCID: PMC3701960](#)
- 18) Rosenberg M.I., Brent A.E., Payre F., & **Desplan C.**
Dual mode of embryonic development is highlighted by expression and function of *Nasonia* pair-rule genes
eLife, **3**:e01440 (2014). [PMCID: PMC3941026](#)
- 19) Johnston R.J.Jr. & **Desplan C.**
Interchromosomal communication coordinates intrinsically stochastic expression between alleles
Science **343**:661-5 (2014). [PMCID: PMC4134473](#)
- 20) Bertet C., Li X., Erclik T., Cavey M., Wells B. & **Desplan C.** Temporal patterning of neuroblasts controls Notch-mediated cell survival through regulation of Hid or Reaper.
Cell **158**, 1173–86 (2014) [PMCID: PMC4153738](#)
- 21) Behnia R., Clark D.A., Carter A.G., Clandinin T.R. & **Desplan C.**
Processing properties of ON and OFF pathways for *Drosophila* motion detection
Nature **512**, 427-30 (2014) [PMCID: PMC4243710](#)
- 22) Rister J., Razzaq A., Boodram P., Desai N., Tsanis C., Chen H., Jukam D., & **Desplan C.**
Single base pair differences in a shared regulatory element determine differential rhodopsin expression
Science **350**, 1258-61 (2015). [PMCID: PMC4919384](#)
- 23) Perry M., Kinoshita M., Saldi G., Huo L., Arikawa K. & **Desplan C.**
Improved color vision in butterflies: molecular logic behind three way stochastic choices.
Nature **535**, 280–284 (2016). [PMCID: PMC4988338](#)
- 24) Erclik T., Li X., Courgeon M., Bertet C., Chen ZC, Baumert R., Ng J., Koo C., Arain U., Behnia R., DelValle-Rodriguez A., Senderowicz L., Negre N., White K. & **Desplan C.**

Selective integration of spatial and temporal inputs generates neural diversity in the *Drosophila* medulla.
Nature **541**, 365-370 Article (2017). [PMCID: PMC5489111](#)

25) Yan H., Opachaloemphan C., Mancini G., Yang H., Gallitto M., Mlejnek J., Haight K., Ghaninia M., Huo L., Leibholz A., Slone J., Zhou X., Traficante M., Penick C.A., Dolezal K., Gokhale K., Stevens K., Fetter-Pruneda I., Bonasio R., Zwiebel L.J., Berger S., Liebig J., Reinberg D., and **Desplan C.**
An engineered *orco* mutation in ants produces aberrant social behavior and defective neural development.
Cell **170**, 736–747 (2017). [PMCID: PMC5587193](#)

26) Wells BS, Pistillo D, Barnhart E, & **Desplan C.**
Parallel activin and BMP signaling coordinates R7/R8 photoreceptor subtype pairing in the stochastic *Drosophila* retina.
eLife Aug 30;6. pii: e25301. doi: 10.7554/eLife.25301 (2017). [PMCID: PMC5599232](#)

27) Fernandes V.M, Chen Z., Rossi A.M., Zipfel J., and **Desplan C.**
Glia relay differentiation cues to coordinate neuronal development in *Drosophila*
Science **357**, 886-891 Article (2017) [PMCID: PMC5835562](#)

28) Pinto-Teixeira F, Koo C, Rossi A, Neriec N, Bertet C, DelValle Rodriguez A, and **Desplan C.**
Development of concurrent retinotopic maps in the fly motion detection circuit.
Cell **173**, 485-498 (2018). [PMCID: PMC5889347](#)

29) Konstantinides N., Kapuralin K., Fadil C., Barboza L., Satija R., and **Desplan C.**
Phenotypic convergence in the brain: distinct transcription factors regulate common terminal neuronal characters.
Cell **174**, 622-635 (2018). [PMCID: PMC6082168](#)

30) Holguera I., and **Desplan C.** Neuronal specification in space and time.
Science **362**, 176-180 (2018). [PMCID: PMC6368964](#)

31) Courgeon M., and **Desplan C.**
Coordination between stochastic and deterministic specification in the *Drosophila* visual system
Science **366** (6463) eaay6727. doi: 10.1126/science.aay6727.2019 (2019) [PMCID: PMC6819959](#)

32) Konstantinides, N, and **Desplan C.**
Neuronal differentiation strategies: insights from single-cell sequencing and machine learning'.
Development 2020 147(23) 2020 dev193631. doi: 10.1242/dev.193631 [PMCID: PMC7746664](#)

33) Rossi AM, and **Desplan C.**
Extrinsic activin signaling cooperates with an intrinsic temporal program to increase mushroom body neuronal diversity.
eLife Jul 6;9:e58880. doi: 10.7554/eLife.58880 (2020) [PMCID: PMC7365662](#)

34) Opachaloemphan C*, Mancini G.*, Konstantinides N., Parikh A.S., Mlejnek J., Yan H., Reinberg D., and **Desplan C.**
Early behavioral and molecular events leading to caste switching in the ant *Harpegnathos*
Genes & Dev. **35**:1-15 doi: 10.1101/gad.343699.120 (2021). [PMCID: PMC7919410](#)

35) Özel M.N., Simon F., Jafari S, Holguera I, Chen Y.C., Benhra N., El-Danaf R., Kapuralin K., Malin J.A., Konstantinides N. and **Desplan C.**
Neuronal diversity and convergence in a visual system developmental atlas
Nature **589**:88-95. doi: 10.1038/s41586-020-2879-3 (2021). [PMCID: PMC7790857](#)

36) Konstantinides* N., Holguera*, I., Rossi* A.M., Escobar A., Dudragne L., Chen Y.C., Tran T., Jaimes A., Özel M.N., Simon F., Shao X., Tsankova N.M., Fullard J.F., Walldorf U., Roussos P., and **Desplan C.**
A comprehensive series of temporal transcription factors in the fly visual system
Nature **604**:316-322. doi: 10.1038/s41586-022-04564-w. (2022). [PMCID: PMC9074256](#)

37) Yan H., Opachaloemphan C., Carmona-Aldana F., Mancini G., Mlejnek J., Descostes N., Sieriebriennikov B., Leibholz A., Zhou X., Ding L., Traficante M., **Desplan# C.**, Reinberg# D.
Insulin signaling and extended longevity in ants
Science, **377**:1092-1099. doi: 10.1126/science.abm8767 (2022). [PMCID: PMC9526546](#)

38) Özel MN., Skok Gibbs C., Holguera I., Soliman M., Bonneau R., and **Desplan. C.**
Coordinated control of neuronal differentiation and wiring by a sustained code of transcription factors
Science, eadd1884. doi: 10.1126/science.add1884 (2022). [PMCID: PMC101932](#)

- 39)** Chen Y.C. D., Chen Y.C., Rajesh R., Shoji N., Jacy M., Lacin H., Ted Erclik T., and **Desplan C.**
Using scRNA sequencing to generate predictive cell-type-specific split-GAL4 reagents throughout development
Proc. Natl. Acad. Sci. USA **120** doi: 10.1073/pnas.2307451120 (2023) [PMCID: PMC10410749](#)
- 40)** Malin J.A., Chen Y.C., Simon F., Keefer E., & **Desplan C.**
Spatial patterning controls neuron numbers in the *Drosophila* visual system
Dev. Cell, **59**:1132-1145 doi: 10.1016/j.devcel.2024.03.004 (2024) [PMCID: PMC11078608](#)
- 41)** El-Danaf R.N., Kapuralin K., Rajesh R., Simon F., Drou N., Pinto-Teixeira F., Özel M.N., and **Desplan C.**
Morphological and functional convergence of visual projection neurons from diverse neurogenic origins in *Drosophila*.
Nat Commun. **16**:698. doi: 10.1038/s41467-025-56059-7 (2025) [PMCID: PMC11735856](#)
- 41)** Choi B.J., Chen Y.C., and **Desplan C.**
Retinal Calcium Waves Coordinate Uniform Tissue Patterning of the *Drosophila* Eye.
Science, In press (2025)
- 42)** Sieriebriennikov B., Kolumba O., de Beaurepaire A., Wu J., Bardol E., Fambri V., Zhong Y., Gainetdinov I., Reinberg D., Yan H, and **Desplan C.**
Transcriptional readthrough and antisense transcription generate singular odorant receptor gene expression in ants
Nature In press (2025)
- 44)** Simon F., Holquera I., Chen Y.C., Malin J., Valentino P., Njoo-Deplante C., El-Danaf R.N, Kapuralin K., Erclik T., Konstantinides N., Özel M.N., and **Desplan C.**
Establishment of terminal selector combinations in optic lobe neurons.
Nature Neuroscience, In press (2025)
- 43)** Ding L., Mlejnek J., Zheng H., Lee C.H., Chen Y.C., Reinberg D. and **Desplan C.**
A Circulating Peptide Controls Social Reprogramming in Ants by suppressing Juvenile Hormone
Submitted

Complete List of Published Work: <http://www.ncbi.nlm.nih.gov/pubmed/?term=desplan+c>

Google Scholars: Published papers: >330

Average Citations/paper: >60

Citation indices:			h-index:			i10-index:	
<u>All</u>	<u>Since 2020</u>		<u>All</u>	<u>Since 2020</u>		<u>All</u>	<u>Since 2020</u>
Citations:	21,253	6,480	80	40		176	114

D. Research Support

Ongoing Research Support

- NIH R01 EY017916 PI: Claude Desplan 2/2007 – 5/2029

Mechanisms of neural patterning and the generation of neural diversity in the brain

How do temporal and spatial patterning of neuroblasts generates neural diversity

- NIH R01 EY13010 PI: Claude Desplan 9/1999 – 8/2026

Coordinated Patterning of Brain Regions.

How do stochastic choices and spontaneous activity in the retina coordinate patterning of the optic lobes.

- NIH R01 AG058762 PIs: Claude Desplan & Danny Reinberg 9/2018 – 5/2028

Aging and rejuvenation: An ant model to study the regulation of longevity

Role of insulin regulation in aging during the conversion of workers ants into pseudoqueens.

- NYU Abu Dhabi Institute Multi PI 3/2012 – 8/2027

NYU Abu Dhabi provides students from over 110 nationalities with a merit-based free American undergraduate education. This grant supports the Center for Genomics and Systems Biology to help local NYU Abu Dhabi faculty develop their research. The money has to be spent exclusively in Abu Dhabi.