BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Claire WYART, Ph.D.	Independent Group Leader, Research Director Inserm
Nationality: USA & France	

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Ecole Normale Supérieure Ulm, Paris, FR	B.Sc.	1998	Biology & Physics
Ecole Normale Supérieure Ulm, Paris, FR	M.Sc.	1999	Neuroscience
Louis Pasteur University, Strasbourg, FR	Ph.D.	2003	Biophysics & Neuroscience
University of California in Berkeley, CA, USA	Postdoc	2005-2010	Biophysics & Neuroscience

Professional Experience

Positions

2005-2009: Postdoctoral Fellow, Dept. Molecular and Cellular Biology, UC Berkeley, USA

2009-2010: Life Science Research Associate, Dept. Mol. and Cell. Biology, UC Berkeley, USA

2011-2015: ATIP-Avenir Group Leader, Institut du Cerveau (ICM), France

2011: Inserm Researcher Position through national competitive selection

2017-current: Promotion to Inserm Research Director (DR2)

Prizes

Richard Lounsbery Prize for Biology	2022
European Research Council - Consolidator Grant	2020
Label “Equipe Fondation Recherche Médicale” (FRM)	2020
Elected EMBO member	2019
Grand Prix of Mme Victor Noury	2019
Proof of Concept Grant – ERC	2018
Human Frontier Research Program – Coordinator Research Grant	2018
FENS-Kavli Network of Excellence fellow	2017
EMBO-Young Investigator Program (EMBO-YIP) Award	2017
Grand Prix de la Fondation Schlumberger pour la Recherche & Education (FSER)	2017
New York Stem Cell Foundation (NYSCF) Robertson Innovator Neuroscience Award	2016
Irene Joliot-Curie Prize	2013
Human Frontier Research Program – Coordinator Research Grant	2013
European Research Council - Starting Grant	2012
Emergence Prize from the City of Paris	2012
Prize Atip-Avenir of the Bettencourt-Schueller Foundation	2011
Chair of Excellence of School of Neurosciences of Paris (ENP)	2011
INSERM CR1 Position through national competitive selection	2011
CNRS CR1 Position through national competitive selection (*declined*)	2011
SfN Chapter Award, Zebrafish Genetics & Development Meeting Best Poster Award	2009
Prize of the Foundation Blancmesnil for documentary Terma	2005
Best PhD from Louis Pasteur University, Prize “Défi Jeunes” for science project Terma	2004

Teaching in international schools and graduate programs

Cajal neuroscience schools [Champalimaud Neuroscience, Lisbon, Portugal: 2016, 2017, 2018, 2019, 2021, 2022 as organizer of the Cajal course & Bordeaux: 2023, 2024]

Molecular Biology Lab (MBL) Woodshole, USA [2018, 2019, 2020 cancelled]

Zenith European Training Network coordinator for 15 grad students across Europe [2019-2023]

Kavli Institute of Theoritical Physics (KITP) in UCSB, USA [2018 *"physics of sensory navigation",* 2022 as organizer of the course "*Biomechanics of locomotion*"; 2025 *"Neurophysics of active sensing"*]

Cold Spring Harbor Lab Imaging Structure and Function of Neurons Course, CSH, USA [2015, 2016]

CNRS Optogenetics course, Paris, France [2019, 2021, 2022, 2023, 2024, 2025]

IJM, Curie & UPMC Optogenetics course, Paris, France [2012-2025]

BIP Master, Motor control, University UPMC Paris-6 & University Descartes Paris-5, France [2011-2025]

Graduate Program of the Brain Research Max Planck Institute in Frankfurt, Germany [2015]

Institute of Neuroscience ION, Shanghai, China [2015]

FENS Optogenetics: Causal Neuroscience Course in Bertinoro, Italy [2011-2013]

Copenhagen Optogenetic Course, Denmark [2011]

Training

21 Ph.D. Students advised – E Warp [2008-12], O Mirat [2011-13], L Djenoune [2011-15], S Knafo [2012-15], U Böhm [2012-16], K Fidelin [2012-16], J Sternberg [2012-16], C Oldfield [2012-16], L Desban [2014-2018], MY Wu [2016-current], F Quan [2017-now], H Marnas [2017-now], M Lapoix [2019-2022], F Ginoux [2022-2024], X Jia [2020-]; M Dhanasekar [2020-], G Sridhar [2020-], T Tzotzolaki [2020-2024], A Redon [2024-], N Peysson [2024-], L Constien [2025-].

17 Postdoctoral Associates mentored (2 Human Frontier Science Program (HFSP) fellows) – C Stokes received *HFSP* long term fellowship [2012-13] now MD-PhD, M Demarque [2012] now INSERM permanent researcher, C Burcklé [2013] now assistant professor Rennes, K Severi [2013-2017] now Assistant Professor Rutgers University, A Prendergast [2014-2019] now head of a facility Yale University, J Hubbard [2014-2017] now Group Leader, Neuroservice, Y Belarif-Cantaut [2016-2020] now CNRS permanent researcher, O Thouvenin [2017-2018] now assistant professor for ESPCI, A Dumitrescu [2017-2020] now project manager public health, A Orts Del'Immagine [2017-2022] now assistant Prof. Paris Cité, M Carbo-Tano [2017-2024] now research scientist in Univ Copenhagen, Danemark, F Quan [2022-now] now project manager, J Guedes [2021-2025] now in NeuroMatch, E Lunsford [2022-] who received *HFSP* long term fellowship; A C Costa [2023-] now INSERM permanent researcher; A Zhou [2024-]; G Messa [2025-] who received Marie-Curie Fellowship.

Organization of international conferences & schools

Deep Brain Stimulation meeting, ICM, Paris, May 2025; European Zebrafish PI meeting, Paris, April 2025; First Richard Lounsbery International symposium, De Duca Foundation, Paris, September 2024; Asilomar Principal Investigator meeting, Asilomar, California, USA January 2024; Brain Body Interaction International conference, Paris Brain Institute, France, March 2024; Cajal Course Motor Control, Bordeaux, France, Nov-Dec 2024; Benzon International Motor Control conference in Copenhagen, Denmark, 2023; European Training Network Coordinator, Europe 2019-2023; EMBO YIP Sectoral meeting, Paris, France, 2022; Cajal Course in Interacting with Neural Circuits, Champalimaud Center for the Unknown, Portugal, 2022; KITP Summer School on Biomechanics of Locomotion, UCSB California, USA, 2022; International Zebrafish Imaging neuronal circuits conference in Bethesda, USA, 2017; International Zebrafish Imaging neuronal circuits conference in Paris, France 2014.

Research grants

2025

ANR [2025-2028] ANR-24-CE16-7992 CIRCOLOCO *"Investigation of the pineal gland in circadian rhythms"*

2024

ANR [2024-2027] ANR-23-CE16-0017-02 RocSMAP *"The Role of Competitive Selection Mechanisms in the Asymmetric Pathway"*

Richard Mille Foundation "DBS: targeting resilient motor circuits in Parkinson's disease"

2023

ANR [2023-2027] ANR-22-CE37-0023 LOCOCONNECT *"Identifying putative synaptic connections from population imaging recordings"*

2021

ANR [2021-2025] ANR-21-CE14-0042 MOTOMYO *"Pairing between motor neurones and muscle fibers"*

ANR [2021-2025] ANR-21-CE13-0008 ASCENTS *"structural asymmetry of the vertebrate centriole*"

2020 ERC Consolidator grant # 101002870 [2022-2026] ***"Exploratome,*** *Circuit mechanisms underlying sensory-evoked navigation"*

2020 Prize Equipe "Fondation pour la Recherche Médicale" (FRM- EQU202003010612) *« Neuronal circuits underlying navigation: from genes to behavioral models »*

2020 Fondation Bettencourt-Schueller (FBS-don-0031, 2020-2024) *« Identity and organization or neuronal networks controlling exploration »*

2018 ERC Proof of Concept (PoC) # 825273 *"Zebrazoom, kinematic analysis for drug and genetic screening in zebrafish"*

2018 Coordinator of the European Training Network (ETN) ZENITH #813457 [2019-2023] *"ZEbrafish Neuroscience Interdisciplinary Training Hub"*

2017 U19 NIH Consortium Grant #1U19NS104653-01 [2017-2022] *Sensorimotor processing, decision making, and internal states: towards a realistic multiscale circuit model of the larval zebrafish brain*

2017 EMBO-YIP [2017-2020] & Human Frontier Science Program (HFSP) Research Grant: # RGP0063/2017 [2018-21] *How do cerebrospinal fluid physical and biochemical properties guide body axis formation and scoliosis?* (CW, Coordinator)

2017 Laureate of the Foundation Schlumberger for Research & Education (FSER) [2017-2020] Title: "*Neuronal modulation of secretion in the cerebrospinal fluid"*

2016 New York Stem Cell Foundation (NYSCF) Robertson Young Innovator Award NYSCF-R-NI39 [2017-2021] Title: "*From fish to macaques, investigation of a sensory interface linking cerebrospinal fluid to motor circuits"*

Human Frontier Science Program (HFSP) Research Grant: # RGP0063/2014 [2013-17] "*Sensory-motor integration in cerebrospinal fluid-contacting neurons"* (CW, Coordinator)

National Institutes of Health (NIH) # 11928047 [2014-17] "*3D holography for 3D optogenetic control of neuronal activity at the single cell resolution"*

European Research Council (ERC) Starting Grant # 311673 (CW, PI coordinator) [2013-18] "*Optoloco, Dynamic sensory-motor integration in spinal circuits"*

Marie Curie International Reintegration Grant (IRG) [2012-16] *"Optoloco, Generating novel transgenic lines to probe circuits underlying locomotion"*

Competitive fellowships obtained for trainees: Marie Curie International Fellowships, Human Frontier Science Program (HFSP), EMBO, Wings for Life, Research-in-Paris, ENP, FRM, Prestige, Erasmus.

Scientific advisory board & edition

Board Reviewing Editor for **Elife** (2019-2023); Board Editor for **Current Biology** (2017-now); Editor of a special issue on motor control for **Current Opinion in Physiology** (2018-2019); Academic Editor for **Frontiers of Neural Circuits** (2016-now); Scientific Advisory Board for the **Cotrel Foundation** (2018-2020); Scientific Advisory Board for the **Fondation pour la Recherche Médicale** (2020-2024), member of the scientific committee of the **Cotrel Foundation** (2018-2021), President of the scientific committee of the **Prize Christine Goudot** from the French Academy (2024).

Peer-reviewed publications

ORCID: 0000-0002-1668-4975 & Web Of Science: AAB-4603-2020

- Chen AB, Duque M, Wang VM, Dhanasekar M, Mi X, Rymbek A, Tocquer L, Narayan S, Prober D, Yu G, Wyart C, Engert F, Ahrens MB. Norepinephrine changes behavioral state via astroglial purinergic signaling [2025] **Science** 388,769-775(2025).DOI:10.1126/science.adq5233

- Sridhar, G, Vergassola, M, Marques, J, Orger, M, Costa, A, Wyart, C. Uncovering multiscale structure in the variability of larval zebrafish navigation [2024]. **PNAS**, 121:e2410254121; DOI: 10.1073/pnas.2410254121.

- Carbo-Tano*, M, Lapoix*, M, Jia, X, Thouvenin, O, Pascucci, M, Auclair, F, Quan, FB, Albadri, S, Aguda, V, Farouj, Y, Hillman, EMC, Portugues, R, Del Bene, F, Thiele, TR, Dubuc R#, WYART, C# [2023]. The mesencephalic locomotor region recruits distributed V2a reticulospinal neurons to drive forward locomotion, **Nature Neuroscience** 26:1775-1790. doi: 10.1038/s41593-023-01418-0. We investigated a new topic of interest dissecting the motor circuits controlling locomotion in the brainstem: we discovered in this study the locus for a highly conserved motor center called the mesencephalic locomotor region (MLR), and established how it triggered forward locomotion via targeted projections onto essential reticulospinal neurons.

- Xu H, Dugué GP, Cantaut-Belarif Y, Lejeune FX, Gupta S, WYART, C#, Lehtinen, MK# [2023]. SCO-spondin knockout mice exhibit small brain ventricles and mild spine deformation. **Fluids Barriers CNS** 20:89. doi: 10.1186/s12987-023-00491-8.

- Marie-Hardy L, Slimani L, Messa G, El Bourakkadi Z, Prigent A, Sayetta C, Koëth F, Pascal-Moussellard H, WYART C#, Cantaut-Belarif Y# [2023]. Loss of CSF-contacting neuron sensory function is associated with a hyper-kyphosis of the spine reminiscent of Scheuermann's disease. **Scientific Reports** 13:5529. doi: 10.1038/s41598-023-32536-1.

- Bellegarda, C, Zavard, G, Moisan, L, Gray, RS, Wyart-Brochard, F, Joanny, JF, Cantaut-Belarif, Y, WYART, C# [2023]. The Reissner fiber under tension in vivo shows dynamic interaction with ciliated cells contacting the cerebrospinal fluid. **Elife** 12: e86175. doi: 10.7554/Elife.86175.

- Prendergast AE, Jim KK, Marnas H, Desban L, Quan FB, Djenoune L, Laghi V, Hocquemiller A, Lunsford ET, Roussel J, Keiser L, Lejeune FX, Dhanasekar M, Bardet PL, Levraud JP, van de Beek D, Vandenbroucke-Grauls CMJE#, WYART C# [2023]. CSF-contacting neurons respond to Streptococcus pneumoniae and promote host survival during central nervous system infection. **Current Biology** 33:940-956.e10. doi: 10.1016/j.cub.2023.01.039. *This original publication in Current Biology shows that neurons contacting the cerebrospinal fluid detect bacterial metabolites to combat infections of the central nervous system, and thereby contribute to innate immunity.*

- Chen, X, Ginoux, F, Mora, T, Walczak, A.M., WYART, C# [2023]. Granger causality analysis for calcium transients in neuronal networks: challenges and improvements. **Elife** 12:e81279 https://doi.org/10.7554/Elife.81279

- Rajan G, Lafaye J, Faini G, Carbo-Tano M, Duroure K, Tanese D, Panier T, Candelier R, Henninger J, Britz R, Judkewitz B, Gebhardt C, Emiliani V, Debregeas G, WYART C, Del Bene F [2022]. Evolutionary divergence of locomotion in two related vertebrate species. **Cell Report** 38:110585. doi: 10.1016/j.celrep.2022.110585.

- Reddy G#, Desban L, Tanaka H, Roussel J, Mirat O, WYART, C# [2022]. A lexical approach for identifying behavioural action sequences. **PLoS Comput Biol.** 18(1):e1009672. doi: 10.1371/journal.pcbi.1009672.

- Orts-Del'Immagine A, Dhanasekar M, Lejeune FX, Roussel J, WYART C# [2022]. A norepinephrine-dependent glial calcium wave travels in the spinal cord upon acoustovestibular stimuli. **Glia** 70(3):491-507. doi: 10.1002/glia.24118.

- Thouvenin, O, Keiser, L, Cantaut-Belarif, Y, Gallaire, F, WYART, C# [2021]. Automated Analysis of Cerebrospinal Fluid Flow and Motile Cilia Properties in The Central Canal of Zebrafish Embryos. **Bioprotocol** 11 (5), DOI: 10.21769/BioProtoc.

- Wu, MY*, Carbo-Tano, M*,#, Mirat, O, Lejeune, FX, Roussel, J, Quan, F, Fidelin, K, WYART, C# [2021]. Spinal sensory neurons project onto hindbrain to stabilize posture and enhance locomotor speed. **Current Biology** S0960-9822(21)00740-5. doi: 10.1016/j.cub.2021.05.042.

- Shipley, FB, Dani, N, Xu H, Deister, C, Cui, J, Head, JP, Sadegh, C, Fame, RM, Shannon, ML, Flores, VI, Kishkovich, T, Jang, E, Klein, EM, Goldey, GJ, He, K, Zhang, Y, Holtzman, MJ, Kirchhausen, T, WYART, C, Moore, CI, Andermann, ML#, Lehtinen, MK# [2020]. Tracking Calcium Dynamics and Immune Surveillance at the Choroid Plexus Blood-Cerebrospinal Fluid Interface. **Neuron** 108:623-639.e10.

- Oldfield, CS, Grossrubatscher, I, Chávez, M, Hoagland, A, Huth, AR, Carroll, EC, Prendergast, AE, Qu, T, Gallant, TL, WYART, C#, Isacoff, EY# [2020]. Experience, circuit dynamics, and forebrain recruitment in larval zebrafish prey capture. **Elife** 9: e56619.

- Quan, FB, Desban, L, Mirat, O, Kermarquer, M, Roussel, J, Koëth, F, Marnas, H, Djenoune, L, Lejeune, FX, Tostivint, H, WYART, C# [2020]. Somatostatin 1.1 contributes to the innate exploration of zebrafish larva. **Scientific Reports** 10: 15235.

- Cantaut-Belarif, Y, Penru, M, Orts Del'Immagine, A, Pézeron, G, WYART, C#, Bardet, P-L# [2020]. Adrenergic activation modulates the signal from the Reissner fiber to cerebrospinal fluid-contacting neurons during development. **Elife** 9:e59469**,** doi: https://doi.org/10.1101/2020.05.26.117341.

- Antinucci*, P, Dumitrescu*, AS, Deleuze, C, Morley, HJ, Leung, K, Hagley, T, Kubo, F, Baier, H, Bianco, IH#, WYART, C# [2020]. A calibrated optogenetic toolbox of stable zebrafish opsin lines, **Elife** 9:e54937. doi: 10.7554/Elife.54937

- Orts-Del'Immagine, A, Cantaut-Belarif, Y,*, Thouvenin, O, Roussel, J, Baskaran, A, Langui, D, Koeth, F, Bivas, P, Lejeune, FX, Bardet, PL, WYART C# [2020]. Sensory neurons contacting the cerebrospinal fluid require the Reissner fiber to detect spinal curvature *in vivo*. **Current Biology** 30:827-839.e4. https://doi.org/10.1016/j.cub.2019.12.071. *We show that neurons contacting the cerebrospinal fluid functionally interact with the Reissner fiber in order to detect curvature of the spine in an asymmetrical manner.*

- Thouvenin, O, Keiser, L, Cantaut-Belarif, Y, Carbo-Tano, M, Verweij, F, Jurisch-Yaksi, N, Bardet, PL, Van Niel, G, Gallaire, F, WYART C# [2020]. Origin and role of the cerebrospinal fluid bidirectional flow in the central canal. **Elife**, 9:e47699. https://doi.org/10.7554/Elife.47699. *We combine experiments and modelling here to demonstrate how a bidirectional flow of cerebrospinal fluid originates from polar and motile cilia inserted on one side only of the central canal.*

- Desban, L, Prendergast, A, Roussel, J, Rosello, M, Geny, D, WYART C#, Bardet, PL [2019]. Regulation of the apical extension morphogenesis tunes the mechanosensory response of microvilliated neurons. **PLoS Biology** 17:e3000235. https://doi.org/10.1371/journal.pbio.3000235

- Severi, KE, Böhm, UL, WYART C# [2018]. Investigation of hindbrain activity during active locomotion reveals inhibitory neurons involved in sensorimotor processing, **Scientific Reports**, 8:13615.

- Sternberg, JR, Prendergast, AE#, Brosse, L, Cantaut-Belarif, Y, Thouvenin, O, Orts-Dell'Immagine, A, Castillo, L, Djenoune, L, Kurisu, S, McDearmid, JR, Bardet, PL, Boccara, C, Okamoto, H, Delmas, P, WYART,

C# [2018] Pkd2l1 is required for mechanoception in cerebrospinal fluid-contacting neurons and maintenance of spine curvature. **Nature Communications**, 9:3804. *We show that neurons contacting the cerebrospinal fluid are mechanosensory cells in vitro detecting pressure via the PKD2L1 channels and that pkd2l1 knock out mutants grow a deformed spine.*

- Cantaut-Belarif Y, Sternberg J, Thouvenin O, WYART C#, Bardet PL# [2018]. The Reissner fiber in the cerebrospinal fluid controls morphogenesis of the body axis. **Current Biology** 28:2479-2486.e4. doi: 10.1016/j.cub.2018.05.079. *We show using genetic manipulations that the Reissner fiber is critical for growing a straight body axis during embryogenesis.*

- Knafo S, WYART C# [2017]. Bioluminescence Monitoring of Neuronal Activity in Freely Moving Zebrafish Larvae. **Elife**, 7:e2550. doi: 10.21769/BioProtoc.2550.

- Knafo S*, Fidelin K*, Prendergast A, Tseng PE, Parrin A, Dickey CW, Bohm UL, Nunes Figueiredo S, Thouvenin O, Pascal-Moussellard H, WYART C# [2017]. Mechanosensory neurons control the timing of spinal microcircuit selection during locomotion. **Elife** 6:e25260. doi: 10.7554/Elife.25260.

- Djenoune L, Desban L, Gomez J, Sternberg JR, Prendergast A, Langui D, Quan FB, Marnas H, Auer TO, Rio JP, Del Bene F, Bardet PL, WYART C# [2017]. The dual developmental origin of spinal cerebrospinal fluid-contacting neurons gives rise to distinct functional subtypes, **Scientific Reports** 7:719. Doi:10.1038/s41598-017-00350-1.

- Hubbard J, Böhm U, Prendergast A, Tseng PE, Stokes C, Newman M, WYART C# [2016]. GABAergic sensory neurons project onto key elements of the escape circuit, **Current Biology** 26: 2841-2853.doi: 10.1016/j.cub.2016.08.026

- Sternberg J*, Severi K*, Fidelin K, Gomez J, Ihara H, Alcheikh Y, Hubbard J, Kawakami K, Suster M, WYART C# [2016]. Optimization of Botulinum toxin to probe the role of specific interneurons in innate locomotion. **Current Biology**, 26: 2319-28. doi:10.1016/j.cub.2016.06.037.

- Hernandez O, Papagiakoumou E, Tanese D, Fidelin K, WYART C, Emiliani V [2016]. Three-dimensional spatiotemporal focusing of holographic patterns, **Nature Communications**, 7:11928. doi: 10.1038/ncomms11928.

- Rupprecht P, Prendergast A, WYART C, Friedrich RW. Remote z-scanning with an acroscopic voice coil motor for fast 3D multiphoton laser scanning microscopy [2016]. **Biomedical Optics Express** 7, 1656-1671. doi: 10.1364/BOE.7.001656.

- Böhm U*, Prendergast A*, Djenoune L, Nunes Figueiredo S, Gomez J, Stokes C, Kaiser S, Suster M, Kawakami K, Charpentier M, Concordet JP, Rio JP, Del Bene F, WYART C# [2016]. CSF-contacting neurons regulate locomotion by relaying mechanical stimuli to spinal circuits. **Nature Communications**, 7:10866. doi: 10.1038/ncomms10866. *We show that neurons contacting the cerebrospinal fluid are mechanosensory cells in vivo detecting spinal curvature in an asymmetric manner via the PKD2L1 channels.*

- Fidelin K, Djenoune L, Stokes C, Prendergast A, Gomez J, Baradel A, Del Bene F, WYART C# [2015]. State-Dependent Modulation of Locomotion by GABAergic Spinal Sensory Neurons. **Current Biology** 25: 3035-47. doi: 10.1016/j.cub.2015.09.070. *We show that neurons contacting the cerebrospinal fluid modulate locomotion by projecting onto key premotor excitatory neurons.*

- Auer TO, Xiao T, Bercier V, Gebhardt C, Duroure K, Concordet JP, WYART C, Suster M, Kawakami K, Wittbrodt J, Baier H, Del Bene F [2015]. Deletion of a kinesin I motor unmasks a mechanism of homeostatic branching control by neurotrophin-3. **Elife** 4: e05061. doi: 10.7554/Elife.05061

- De Vico Fallani F, Corazzol M, Sternberg J, WYART C#, Chavez M [2015]. Hierarchy of neural organization in the embryonic spinal cord: Granger-Causality graph analysis of in vivo calcium imaging data. **IEEE Trans Neural Syst Rehabil Eng**. 23:333-41. doi:10.1109/TNSRE.2014.2341632

- Quan FB, Dubessy C, Galant S, Kenigfest NB, Djenoune L, Leprince J, WYART C, Lihrmann I, Tostivint H [2015]. Comparative distribution and in vitro activities of the urotensin II-related peptides URP1 and URP2 in zebrafish: evidence for their colocalization in spinal cerebrospinal fluid-contacting neurons. **PLoS One** 10:e0119290. doi: 10.1371/journal.pone.0119290

- Lauterbach MA, Ronzitti E, Sternberg JR, WYART C, Emiliani V [2015]. Fast Calcium Imaging with Optical Sectioning via HiLo Microscopy. **Plos One** 10: e0143681. doi: 10.1371/journal.pone.0143681.

- Goetz JG, Steed E, Ferreira RR, Roth S, Ramspacher C, Boselli F, Charvin G, Liebling M, WYART C, Schwab Y, Vermot J [2014]. Endothelial cilia mediate low flow sensing during zebrafish vascular development. **Cell Reports** 6:799-808. doi: 10.1016/j.celrep.2014.01.032

- Djenoune L, Khabou H, Joubert F, Nunes Figueiredo S, Bodineau L, Del Bene F, Burcklé C, Tostivint H, WYART C# [2014]. Investigation of spinal cerebrospinal fluid-contacting neurons expressing PKD2L1: evidence for a conserved system from fish to primates. **Frontiers in Neuroanatomy** 6, 8:26. doi: 10.3389/fnana.2014.00026

- Mirat O, Sternberg JR, Severi KE, WYART C# [2013]. ZebraZoom: an automated program for high-throughput behavioral analysis and categorization. **Frontiers in Neural Circuits** 7:107. doi: 10.3389/fncir.2013.00107.

- Hong E, Santhakumar K, Akitake CA, Ahn SJ, Thisse C, Thisse B, WYART C, Mangin JM, Halpern M# [2013]. Cholinergic left-right asymmetry in the habenulo-interpeduncular pathway. **PNAS** 110: 21171-76. doi: 10.1073/pnas.1319566110.

- Warp E, Agarwal G, WYART C, Friedmann D, Oldfield CS, A Conner, Del Bene F, Arrenberg AB, Baier H, Isacoff EY# [2012]. Emergence of patterned activity in the developing zebrafish spinal cord. **Current Biology** 22: 93-102. doi: 10.1016/j.cub.2011.12.002

- Del Bene F*, WYART C*, Robles E, Tran A, Looger LL, Scott EK, Isacoff EY#, Baier H# [2010]. Filtering of visual information in the tectum by an identified neural circuit. **Science** 330: 669-673. doi: 10.1126/science.1192949. *My contribution here on calcium imaging and behavior analysis enable to show a critical loop controlling prey capture in the tectum (equivalent of the superior colliculus in fish).*

- Janovjak H, Szobota S, WYART C, Trauner D, Isacoff EY [2010]. A light-gated, potassium-selective glutamate receptor for the optical inhibition of neuronal firing. **Nature Neuroscience** 13: 1027-1032.doi: 10.1038/nn.2589.

- WYART C*, Del Bene F*, Warp E, Scott EK, Trauner D, Baier H#, Isacoff EY# [2009]. Optogenetic dissection of a behavioural module in the vertebrate spinal cord. **Nature** 461: 407-410. doi: 10.1038/nn.2589. *My pioneering work relied on innovative chemo-optogenetic tools to show that neurons contacting the cerebrospinal fluid in the spinal cord can control locomotion in vivo.*

- Pautot S, WYART C, Isacoff EY [2008]. Colloid-guided assembly of oriented 3D neuronal networks. **Nature Methods** 5: 735-740. doi: 10.1038/nmeth.1236.

- Szobota S, Gorostiza P, Del Bene F, WYART C, Fortin DL, Kolstad KD, Tulyathan O, Volgraf M, Numano R, Aaron HL, Scott EK, Kramer RH, Flannery J, Baier H, Trauner D, Isacoff EY [2007]. Remote control of neuronal activity with a light-gated glutamate receptor. **Neuron** 45: 535-545. doi: 10.1016/j.neuron.2007.05.010.

- WYART C, Webster WW, Chen JH, Wilson SR, McClary A, Khan RM, Sobel N [2007]. Smelling a single component of male sweat alters levels of cortisol in women. **The Journal of Neuroscience** 27: 1261-1265. doi: 10.1523/JNEUROSCI.4430-06.2007.

- Salome R, Kremer Y, Dieudonne S, Léger JF, Krichevsky O, WYART C, Chatenay D [2006]. Ultrafast random-access scanning in two-photon microscopy using acousto-optic deflectors. **Journal of Neuroscience Methods** 154: 161-174. 10.1016/j.jneumeth.2005.12.010.

- WYART C, Cocco S, Bourdieu L, Léger JF, Herr C, Chatenay D [2005]. Dynamics of excitatory synaptic components in sustained firing at low rates. **Journal of Neurophysiology** 93: 3370-3380. doi: 10.1152/jn.00530.2004.

- WYART C, Ybert C, Bourdieu L, Herr C, Prinz C, Chatenay D [2002]. Constrained synaptic connectivity in functional mammalian neuronal networks grown on patterned surfaces. **Journal of Neuroscience Methods** 117: 123-131. doi: 10.1016/s0165-0270(02)00077-8.

- Knowles RB, WYART C, Buldyrev SV, Cruz L, Urbanc B, Hasselmo ME, Stanley HE, Hyman BT [1999]. Plaque-induced neurite abnormalities: implications for disruption of neural networks in Alzheimer's disease. **PNAS** 96: 5274-5279. doi: 10.1073/pnas.96.9.5274.

Preprints

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Chapters and reviews

- Jia, X, WYART, C# [2024]. Holographic Optogenetic Activation of Neurons Eliciting Locomotion in Head-Embedded Larval Zebrafish. **Methods Molecular Biology** 2707:125-140. doi: 10.1007/978-1-0716-3401-1_8.

- WYART, C#, Carbo-Tano M [2023]. Design of mechanosensory feedback during undulatory locomotion to enhance speed and stability. **Curr Opin Neurobiol** 83:102777. doi: 10.1016/j.conb.2023.102777.

- WYART, C#, Carbo-Tano, M, Cantaut-Belarif, Y, Orts-Del'Immagine, A, Böhm, UL [2023]. Cerebrospinal fluid-contacting neurons: Roles in motion, posture, morphogenesis and host defense. **Nature Reviews Neuroscience** 24:540-556. IF = 39.1. doi: 10.1038/s41583-023-00723-8. *Review 10 years of investigations on the sensory and secretory functions of neurons contacting the cerebrospinal fluid and their impact on locomotion and posture, morphogenesis during development and innate immunity.*

- WYART, C#, Jim, KK, Prendergast, AE [2023]. Sensory Systems in the Peripheral and Central Nervous Systems Shape Host Response During Infections. **Neuroscience** 525:47-50. doi: 10.1016/j.neuroscience.2023.07.008.

- WYART, C# [2023]. [Polymodal sensory integration at the interface with the cerebrospinal fluid]. **Médecine Sciences**, 39:537-543. doi: 10.1051/medsci/2023082. I review here the sensory and motor roles of ciliated neurons contacting the cerebrospinal fluid.

- Dallmann, CJ, Dickerson, BH, Simpson, JH, WYART, C, Jayaram K [2023]. Mechanosensory Control of Locomotion in Animals And Robots: Moving Forward**. Integr Comp Biol** 5:icad057. doi: 10.1093/icb/icad057. We review here the role of sensory feedback across species and relate neural systems to robotics.

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- Miles G, WYART C [2019]. Motor control systems of the spinal cord and hindbrain. **Curr Opin Physiol** doi: 10.1016/j.cophys.2019.04.003.

- WYART C, Thirumalai V [2019]. Building behaviors, one layer at a time. **Elife** 8. pii: e46375. doi: 10.7554/Elife.46375. doi: 10.7554/eLife.46375.

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- Böhm and WYART C [2016]. Sensory circuits in motion. **Curr Opin Neurobiol** 41: 38-43. doi: 10.1016/j.conb.2016.07.007.

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- Prendergast A and WYART C [2016]. Locomotion: Electrical Coupling of Motor and Premotor Neurons. **Current Biology**, 26: R235-7. doi: 10.1016/j.cub.2016.02.021.

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- WYART C and Knafo S [2015]. Sensorimotor Integration in the Spinal Cord, from Behaviors to Circuits: New Tools to Close the Loop? New Techniques in Systems Neuroscience, **Springer**, p.197-234.

- Fidelin K and WYART C [2014]. Inhibition and motor control in the developing zebrafish spinal cord. **Current Opinion in Neurobiology** 26: 103-109. doi: 10.1016/j.conb.2013.12.016.

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- Del Bene F and WYART C [2012]. Optogenetics: a new enlightenment age for zebrafish neurobiology. **Dev. Neurobiol.** 72:404-414. doi: 10.1002/dneu.20914.

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Invited talks

Selected talks at international conferences in 2018-2026

2026: FSER meeting Feb, Les Saisies; CSHL Neuronal circuit meeting March 2026; Okkaido, Neuroscience Winter Conference, March 2026; Deep Brain Stimulation PBI meeting, April 2026;Max Delbruck Seminar series, May 2026; 2025: NeuroAI meeting Jan, Paris, PBI; Okinawa Institute for Science and Technology (OIST), Feb, Japan; Geilo School of biophysics, March, Norway; PRBB annual conference June, Barcelona, Spain; KITP UCSB Aug, Behavior analysis and modeling, Sept NYU, NYC, USA; AXON2025 Sept Rotterdam; Argentinian Neuroscience Society meeting Oct 2025; Machine learning and behavior Oct CCU, Lisboa, POR; Physics and neurobiology, meeting PBI, Nov 2025; 2024: SICB Seattle Jan, SCZI meeting, Asilomar USA Jan, UNIL Switzerland, Feb 2024, Cosyne March, Lisbon, Portugal; Solvay, Belgium, April 2024; MPI Neurobiology Bonn, Germany, May 2024; NeuroEthology meeting July 2024, Berlin; Banyuls Summer School Translational research, Aug 2024; Lounsbery conference, Sept 2024; Data analysis FENS school, Strasbourg, Sept 2024; Optical Sensors, Spain Oct 2024; Cajal Motor School Nov 2024, Bordeaux; 2023: SICB2023 Austin, Texas, USA; NIH, March 2023; Cornell University, March 2023; Motor Symposium, June 2023; NeuroFrance 2023, Lyon, May; Neurodevelopmental school, OIST, July 2023; IBRO Alicante, Sept 2023; Benzon Conference, Sept 2023; MPI Brain Research, Frankfurt, Germany de 2023; 2022: Cilia EMBO meeting in Köln, 2022; 2022 Brandeis University August; Kavli Institute of Theoretical Physics, UC Santa Barbara, July; 2021 EMBO seminar, Japan; 2021, World Wide Neuro, online; 2021 Lund University, Sweden; 2020, Cold Spring Harbor Neuroscience meeting Keynote Lecture; Engineering school ESPCI; Biozentrum Basel Seminar series; University of California in San Diego (UCSD) Seminar series; University of Washington in Oregon Seminar Series;World Wild Neuroscience seminar series; Kavli Institute of Neuroscience, Trondheim, Norway, February; Karlsruhe Institute of Technology (KIT), Germany, March; Dutch Meningitis international conference, Amsterdam, Netherlands, March; Optics in the Brain, Florida, USA, April; Solden International Neuroscience conference, April; Neurodevo conference, Janelia Research Campus, May; Swiss Zebrafish Conference, Lausanne, Switzerland, May; NYSCF retreat, Montaulk, NY, USA, May; Caesar Institute Conference, Bonn, Germany, June; Innate Immunity EMBO Meeting, EMBL, Heidelberg, Germany, June; Champalimaud Neuroscience School, Portugal, July; Gordon conference Molecular and Cellular Neuroscience, Hong Kong, July; FENS 2018 meeting, Berlin, Germany, July; Satellite optogenetics meeting, Berlin, Germany, July; Kavli Institute of Theoritical Physics (KITP) Summer School, UCSB, USA, August; Molecular Biology Labs (MBL), Woodshole, USA, August; Parisian School of Neuroscience (ENP) Days, France, September; FENS Kavli annual meeting, La Jolla, November; Foundation Cotrel Annual meeting, Paris, November; Zebrafish PI meeting in Brighton, UK, December; New York University in Abu Dhabi seminar, Abu Dhabi, United Emirates, December.

Teaching in international schools and graduate programs in 2018-2025

KITP Active sensing school Aug 2025; Banyuls Summer School Translational research, Aug 2024; Data analysis FENS school, Strasbourg, Sept 2024; Cajal Motor School Nov 2024, Bordeaux; Kavli Institute of Theoritical Physics (KITP) “Summer School on Navigation” (2018) and “Neurophysics of locomotion” (2022), UC Santa Barbara, USA; Cajal Summer School Program (Champalimaud Center for the Unknown, CCU), POR (2016-2022); International Optogenetics course, CNRS, Paris, FR; International Optogenetics course, University of Paris, FR; University UPMC Paris-6 & University

Descartes Paris-5 Physiology Masters, FR; ENS Cachan Agregation program for training high school and university teachers, FR.

Selecting chair positions & organization of meetings

Motor control conference, Sorbonne University, Sept 2025; AI and Biology, Nov 2025, Paris; Motor Control June 2025 in St Andrews, Scotland, UK; Deep Brain Stimulation Paris Brain Institute meeting, May 2025; European Zebrafish PI meeting, Paris, April 2025; Behavior analysis and data processing, May 2024; Brain Body Interactions, Paris Brain Institute, March 2024; Benzon meeting “Bringing circuit for movement together” Sept 2023; Zenith Hackathon, Paris, June 2023; Zenith European Training Network Final Symposium, June 2023; NeuroFrance 2023, Lyon, May 2023; Zenith Final Symposium, June 2023, Paris ; Zenith Training in Champalimaud, Lisboa, Nov 2021; Zenith kick-off meeting, Paris, Feb 2020; Chair in the Solden Neuroscience Conference, in 2022 and 2019, Solden, Austria; Chair in the Zebrafish neural circuits PI meeting 2018, Brighton, UK and Paris, 2017, France; Chair in the Motor Symposium satellite meeting @SfN 2018, USA; Cerebrospinal fluid symposium 2018, December 27, Paris with Profs. Maria Lehtinen, Harvard Medical School and Francois Gallaire, EPFL.