

**Name**

Carl-Philipp Heisenberg

**Research Keywords**

Embryo morphogenesis, cell mechanics, cell migration

**Education and Training**

1997-2000 Postdoctoral training, University College London  
1997 PhD, Max-Planck-Institute of Developmental Biology Tübingen/  
Eberhard-Karls-Universität Tübingen  
1995 MPhil, University of Cambridge  
1992 Diploma Biology, Ludwig-Maximilians-Universität München

**Professional Appointments**

2010 Professor, IST Austria, Klosterneuburg, Austria  
2001-2010 Group Leader and Emmy-Noether Junior Professor, Max-Planck-  
Institute of Molecular Cell Biology and Genetics Dresden, Germany

**Selected Awards and Distinctions**

2017 Annual Science Prize Lower Austria  
2017 ERC Advanced Grant  
2016 Member EMBO  
2015 Member German Academy of Sciences (Leopoldina)  
2000 Emmy Noether Junior Professorship (DFG)  
1997 Postdoctoral Fellowship Marie-Curie (EC)  
1997 Postdoctoral Fellowship (EMBO)  
1992 Exchange Student Fellowship (DAAD)

**Major Professional Service Activities**

2019- Editorial Board Member Developmental Cell  
2018- Member of the Board of Reviewing Editors at SCIENCE  
2016- Member (elected) of the DFG Senate committee for Collaborative  
Research Centers  
2015- Member of the Scientific Advisory Board, Ingrid zu Solms Stiftung  
Frankfurt  
2014- Editorial Board Member Current Biology  
2013- Editorial Board Member Development  
2011- Editorial Board Member Developmental Biology,  
2011- Editorial Board Member EMBO Journal  
2010- Editorial Board Member Current Opinion in Cell Biology  
2009-13 Editorial Board Member Developmental Dynamics  
2009- Member of Faculty 1000, Section Head  
2008-2012 Member (elected) of the DFG review panel Cell and Developmental  
Biology  
2008-2014 Editor of PLoS ONE

## Publication List

(total number of citations=13959; h=63)

### Journal Publications

Shamipour S, Kardos R, Xue SL, Hof B, Hannezo E, Heisenberg CP.  
Phase segregation of ooplasm and yolk granules in zebrafish oocytes is mediated by periodic bulk actin polymerization waves.  
Cell. 2019 (in press)

Xia P, Gütl D, Zheden V, Heisenberg CP.  
Lateral Inhibition in Cell Specification Mediated by Mechanical Signals Modulating TAZ Activity.  
Cell. 2019 Feb 8. pii: S0092-8674(19)30052-2.

Čapek D, Smutny M, Tichy AM, Morri M, Janovjak H, Heisenberg CP.  
Light-activated Frizzled7 reveals a permissive role of non-canonical Wnt signaling in mesendoderm cell migration.  
Elife. 2019 Jan 16;8. pii: e42093.

Petridou NI, Grigolon S, Salbreux G, Hannezo E, Heisenberg CP.  
Fluidization-mediated tissue spreading by mitotic cell rounding and non-canonical Wnt signalling.  
Nat Cell Biol. 2019 Feb;21(2):169-178.

Carvalho L, Patricio P, Ponte S, Heisenberg CP, Almeida L, Nunes AS, Araújo NAM, Jacinto A.  
Occluding junctions as novel regulators of tissue mechanics during wound repair.  
J Cell Biol. 2018 Dec 3;217(12):4267-4283.

Schmalhorst PS, Deluweit F, Scherrers R, Heisenberg CP, Sikora M.  
Overcoming the Limitations of the MARTINI Force Field in Simulations of Polysaccharides.  
J Chem Theory Comput. 2017 Oct 10;13(10):5039-5053.

Barone V, Lang M, Krens SFG, Pradhan SJ, Shamipour S, Sako K, Sikora M, Guet CC, Heisenberg CP.  
An Effective Feedback Loop between Cell-Cell Contact Duration and Morphogen Signaling Determines Cell Fate.  
Dev Cell. 2017 Oct 23;43(2):198-211.e12.

Smutny M, Ákos Z, Grigolon S, Shamipour S, Ruprecht V, Čapek D, Behrndt M, Papusheva E, Tada M, Hof B, Vicsek T, Salbreux G, Heisenberg CP.  
Friction forces position the neural anlage.  
Nat Cell Biol. 2017 Apr;19(4):306-317.

- Morita H, Grigolon S, Bock M, Krens SF, Salbreux G, Heisenberg CP.  
The Physical Basis of Coordinated Tissue Spreading in Zebrafish Gastrulation.  
*Dev Cell*. 2017 Feb 27;40(4):354-366.e4.
- Diz-Muñoz A, Romanczuk P, Yu W, Bergert M, Ivanovitch K, Salbreux G, Heisenberg CP, Paluch EK.  
Steering cell migration by alternating blebs and actin-rich protrusions.  
*BMC Biol*. 2016 Sep 2;14:74.
- Sako K, Pradhan SJ, Barone V, Inglés-Prieto Á, Müller P, Ruprecht V, Čapek D, Galande S, Janovjak H, Heisenberg CP.  
Optogenetic Control of Nodal Signaling Reveals a Temporal Pattern of Nodal Signaling Regulating Cell Fate Specification during Gastrulation.  
*Cell Rep*. 2016 Jul 19;16(3):866-77.
- Saha A, Nishikawa M, Behrndt M, Heisenberg CP, Jülicher F, Grill SW.  
Determining Physical Properties of the Cell Cortex.  
*Biophys J*. 2016 Mar 29;110(6):1421-9.
- Callan-Jones AC, Ruprecht V, Wieser S, Heisenberg CP, Voituriez R.  
Cortical Flow-Driven Shapes of Nonadherent Cells.  
*Phys Rev Lett*. 2016 Jan 15;116(2):028102.
- Maiuri P, Rupprecht JF, Wieser S, Ruprecht V, Bénichou O, Carpi N, Coppey M, De Beco S, Gov N, Heisenberg CP, Lage Crespo C, Lautenschlaeger F, Le Berre M, Lennon-Dumenil AM, Raab M, Thiam HR, Piel M, Sixt M, Voituriez R.  
Actin Flows Mediate a Universal Coupling between Cell Speed and Cell Persistence.  
*Cell*. 2015 Apr 9;161(2):374-86.
- Porazinski S, Wang H, Asaoka Y, Behrndt M, Miyamoto T, Morita H, Hata S, Sasaki T, Krens SF, Osada Y, Asaka S, Momoi A, Linton S, Miesfeld JB, Link BA, Senga T, Castillo-Morales A, Urrutia AO, Shimizu N, Nagase H, Matsuura S, Bagby S, Kondoh H, Nishina H, Heisenberg CP, Furutani-Seiki M.  
YAP is essential for tissue tension to ensure vertebrate 3D body shape.  
*Nature*. 2015 May 14;521(7551):217-21.
- Ruprecht V, Wieser S, Callan-Jones A, Smutny M, Morita H, Sako K, Barone V, Ritsch-Marte M, Sixt M, Voituriez R, Heisenberg CP.  
Cortical contractility triggers a stochastic switch to fast amoeboid cell motility.  
*Cell*. 2015 Feb 12;160(4):673-85.
- Compagnon J, Barone V, Rajshekar S, Kottmeier R, Pranjić-Ferscha K, Behrndt M, Heisenberg CP.  
The notochord breaks bilateral symmetry by controlling cell shapes in the zebrafish laterality organ.  
*Dev Cell*. 2014 Dec 22;31(6):774-83.

- Campinho P, Behrndt M, Ranft J, Risler T, Minc N, Heisenberg CP.  
Tension-oriented cell divisions limit anisotropic tissue tension in epithelial spreading during zebrafish epiboly.  
Nat Cell Biol. 2013 Dec;15(12):1405-14.
- Tay HG, Schulze SK, Compagnon J, Foley FC, Heisenberg CP, Yost HJ, Abdelilah-Seyfried S, Amack JD.  
Lethal giant larvae 2 regulates development of the ciliated organ Kupffer's vesicle.  
Development. 2013 Apr;140(7):1550-9.
- Castanon I, Abrami L, Holtzer L, Heisenberg CP, van der Goot FG, González-Gaitán M.  
Anthrax toxin receptor 2a controls mitotic spindle positioning.  
Nat Cell Biol. 2013 Jan;15(1):28-39.
- Behrndt M, Salbreux G, Campinho P, Hauschild R, Oswald F, Roensch J, Grill SW, Heisenberg CP.  
Forces driving epithelial spreading in zebrafish gastrulation.  
Science. 2012 Oct 12;338(6104):257-60.
- Maître JL, Berthoumieux H, Krens SF, Salbreux G, Jülicher F, Paluch E, Heisenberg CP.  
Adhesion functions in cell sorting by mechanically coupling the cortices of adhering cells.  
Science. 2012 Oct 12;338(6104):253-6.
- Stockinger P, Maître JL, Heisenberg CP.  
Defective neuroepithelial cell cohesion affects tangential branchiomotor neuron migration in the zebrafish neural tube.  
Development. 2011 Nov;138(21):4673-83.
- Row RH, Maître JL, Martin BL, Stockinger P, Heisenberg CP, Kimelman D.  
Completion of the epithelial to mesenchymal transition in zebrafish mesoderm requires Spadetail.  
Dev Biol. 2011 Apr 2.
- Krens SF, Möllmert S, Heisenberg CP.  
Enveloping cell-layer differentiation at the surface of zebrafish germ-layer tissue explants.  
Proc Natl Acad Sci U S A. 2011 Jan 18;108(3):E9-10
- Diz-Muñoz A, Krieg M, Bergert M, Ibarlucea-Benitez I, Muller DJ, Paluch E, and Heisenberg CP.  
Control of directed cell migration in vivo by membrane-to-cortex attachment.  
PLoS Biol. 2010 Nov 30;8(11):e1000544.

Leung TK, Veldhuis JH, Krens SF, Heisenberg CP, Brodland GW.  
Identifying Same-Cell Contours in Image Stacks: A Key Step in Making 3D  
Reconstructions.  
Ann Biomed Eng. 2010 Nov 20.

Quesada-Hernández E, Caneparo L, Schneider S, Winkler S, Liebling M, Fraser SE,  
Heisenberg CP.  
Stereotypical cell division orientation controls neural rod midline formation in  
zebrafish.  
Curr Biol. 2010 Nov 9;20(21):1966-72.

Klopper AV, Krens G, Grill SW, Heisenberg CP.  
Finite-size corrections to scaling behavior in sorted cell aggregates.  
Eur Phys J E Soft Matter. 2010 Oct;33(2):99-103.

Oteiza P, Köppen M, Krieg M, Pulgar E, Farias C, Melo C, Preibisch S, Müller D, Tada  
M, Hartel S, Heisenberg CP, Concha ML.  
Planar cell polarity signalling regulates cell adhesion properties in progenitors of  
the zebrafish laterality organ.  
Development. 2010 Oct;137(20):3459-68.

Arboleda-Estudillo Y, Krieg M, Stühmer J, Licata NA, Muller DJ, Heisenberg CP.  
Movement directionality in collective migration of germ layer progenitors.  
Curr Biol. 2010 Jan 26;20(2):161-9.

Kardash E, Reichman-Fried M, Maître JL, Boldajipour B, Papusheva E,  
Messerschmidt EM, Heisenberg CP, Raz E.  
A role for Rho GTPases and cell-cell adhesion in single-cell motility in vivo.  
Nat Cell Biol. 2010 Jan;12(1):47-53

Carvalho L, Stühmer J, Bois JS, Kalaidzidis Y, Lecaudey V, Heisenberg CP.  
Control of convergent yolk syncytial layer nuclear movement in zebrafish.  
Development. 2009 Apr;136(8):1305-15.

Krieg M, Helenius J, Heisenberg CP, Muller DJ.  
A bond for a lifetime: employing membrane nanotubes from living cells to  
determine receptor-ligand kinetics.  
Angew Chem Int Ed Engl. 2008;47(50):9775-7.

Kai M, Heisenberg CP, Tada M.  
Sphingosine-1-phosphate receptors regulate individual cell behaviours underlying  
the directed migration of prechordal plate progenitor cells during zebrafish  
gastrulation.  
Development. 2008 Aug 13.

- Oteíza P, Köppen M, Concha ML and Heisenberg CP.  
Origin and shaping of the laterality organ in zebrafish.  
Development. 2008 Aug;135(16):2807-13.
- Vervenne HB, Crombez KR, Lambaerts K, Carvalho L, Koeppen M, Heisenberg CP, Van de Ven WJ, and Petit MM.  
Lpp is involved in Wnt/PCP signaling and acts together with Scrib to mediate convergence and extension movements during zebrafish gastrulation.  
Dev Biol. 2008 May 20.
- Krieg M, Arboleda Y, Puech PH, Käfer J, Graner F, Muller DJ and Heisenberg CP.  
Tensile forces govern germ layer organization during gastrulation.  
Nat Cell Biol. 2008 Apr;10(4):429-36.
- Schötz EM, Burdine RD, Jülicher F, Steinberg MS, Heisenberg CP and Foty RA.  
Quantitative Differences in Tissue Surface Tension Influence Zebrafish Germ Layer Positioning.  
HFSP Journal. 2008 Feb; 2(1):42-56.
- von der Hardt S, Bakkers J, Inbal A, Carvalho L, Solnica-Krezel L, Heisenberg CP, Hammerschmidt M.  
The Bmp Gradient of the Zebrafish Gastrula Guides Migrating Lateral Cells by Regulating Cell-Cell Adhesion.  
Curr Biol. 2007 Mar 20;17(6):475-87.
- Tonelli Dde P, Calegari F, Fei JF, Nomura T, Osumi N, Heisenberg CP, Huttner WB.  
Single-cell detection of microRNAs in developing vertebrate embryos after acute administration of a dual-fluorescence reporter/sensor plasmid.  
Biotechniques. 2006 Dec;41(6):727-32.
- Witzel S, Zimyanin V, Carreira-Barbosa F, Tada M and Heisenberg CP.  
Wnt11 controls cell-cell contact persistence by local accumulation of Frizzled-7 at the plasma membrane.  
J Cell Biol. 2006 Dec 4;175(5):791-802.
- Blaser H, Reichman-Fried M, Castanon I, Dumstrei K, Marlow FL, Kawakami K, Solnica-Krezel L, Heisenberg CP and Raz E.  
Migration of Zebrafish Primordial Germ Cells: a Role for Myosin Contraction and Cytoplasmic Flow.  
Dev Cell. 2006 Nov;11(5):613-27.
- Koeppen M, Garcia-Frenandez B, Carvalho L, Jacinto A and Heisenberg CP.  
Coordinated cell shape changes control epithelial movement in zebrafish and Drosophila.  
Development. 2006 Jul;133(14):2671-81.

Link V, Carvalho L, Castanon I, Stockinger P, Shevchenko A and Heisenberg CP.

Identification of regulators of germ layer morphogenesis using proteomics in zebrafish.

J Cell Sci. 2006 May 15;119(Pt 10):2073-83.

Langenberg T, Dracz T, Oates AC, Heisenberg CP, Brand M.

Analysis and visualization of cell movement in the developing zebrafish brain.

Dev Dyn. 2006 Apr;235(4):928-33.

Link V, Shevchenko A, Heisenberg CP.

Proteomics of early zebrafish embryos.

BMC Dev Biol. 2006 Jan 13;6:1.

Ulrich F, Krieg M, Schoetz EM, Link V, Castanon I, Schnabel V, Taubenberger A, Muller DJ, Puech PH, Heisenberg CP.

Wnt11 functions in gastrulation by controlling cell cohesion through Rab5 and E-cadherin.

Dev Cell. 2005 Oct;9(4):555-64.

Puech PH, Taubenberger A, Ulrich F, Krieg M, Muller DJ, Heisenberg CP.

Measuring cell adhesion forces of primary gastrulating cells from zebrafish using atomic force microscopy.

J Cell Sci. 2005 Sep 15;118(Pt 18):4199-206.

Montero JA, Carvalho L, Wilsch-Brauninger M, Kilian B, Mustafa C and Heisenberg, CP.

Shield formation at the onset of zebrafish gastrulation.

Development. 2005 Mar;132(6):1187-98.

Norton WH, Mangoli M, Lele Z, Pogoda HM, Diamond B, Mercurio S, Russell C, Teraoka H, Stickney HL, Rauch GJ, Heisenberg CP, Houart C, Schilling TF, Frohnhoefer HG, Rastegar S, Neumann CJ, Gardiner RM, Strahle U, Geisler R, Rees M, Talbot WS, Wilson SW.

Monorail/Foxa2 regulates floorplate differentiation and specification of oligodendrocytes, serotonergic raphe neurones and cranial motoneurones.

Development. 2005 Feb;132(4):645-58.

Ulrich F, Concha ML, Heid PJ, Voss E, Witzel S, Roehl H, Tada M, Wilson SW, Adams RJ, Soll DR, Heisenberg CP.

Slb/Wnt11 controls hypoblast cell movement and morphogenesis at the onset of zebrafish gastrulation.

Development. 2003 Nov;130(22):5375-84.

Montero JA, Kilian B, Chan J, Bayliss PE, and Heisenberg, CP. Phosphoinositide 3-kinase controls process outgrowth and cell polarisation of gastrulating mesendodermal cells.  
Curr Biol. 2003 Aug 5;13(15):1279-89.

Kilian B, Mansukoski H, Barbosa FC, Ulrich F, Tada M, Heisenberg CP.  
The role of Ppt/Wnt5 in regulating cell shape and movement during zebrafish gastrulation.  
Mech Dev. 2003 Apr;120(4):467-76.

Hannus M, Feiguin F, Heisenberg CP, Eaton S.  
Planar cell polarization requires Widerborst, a B' regulatory subunit of protein phosphatase 2A.  
Development. 2002 Jul;129(14):3493-503.

Houart C, Caneparo L, Heisenberg C, Barth K, Take-Uchi M, Wilson S.  
Establishment of the telencephalon during gastrulation by local antagonism of Wnt signaling.  
Neuron. 2002 Jul 18;35(2):255-65.

Heisenberg CP, Houart C, Take-Uchi M, Rauch GJ, Young N, Coutinho P, Masai I, Caneparo L, Concha ML, Geisler R, Dale TC, Wilson SW, Stemple DL.  
A mutation in the Gsk3-binding domain of zebrafish Masterblind/Axin1 leads to a fate transformation of telencephalon and eyes to diencephalon.  
Genes Dev. 2001 Jun 1;15(11):1427-34.

Heisenberg CP, Tada M, Rauch GJ, Saude L, Concha ML, Geisler R, Stemple DL, Smith JC, Wilson SW.  
Silberblick/Wnt11 mediates convergent extension movements during zebrafish gastrulation.  
Nature. 2000 May 4;405(6782):76-81.

Heisenberg CP, Brennan C, Wilson SW.  
Zebrafish aussicht mutant embryos exhibit widespread overexpression of ace (fgf8) and coincident defects in CNS development.  
Development. 1999 May;126(10):2129-40.

Heisenberg CP, Nusslein-Volhard C.  
The function of silberblick in the positioning of the eye anlage in the zebrafish embryo.  
Dev Biol. 1997 Apr 1;184(1):85-94.

Masai I, Heisenberg CP, Barth KA, Macdonald R, Adamek S, Wilson SW.  
Floating head and masterblind regulate neuronal patterning in the roof of the forebrain.  
Neuron. 1997 Jan;18(1):43-57.



Granato M, van Eeden FJ, Schach U, Trowe T, Brand M, Furutani-Seiki M, Haffter P, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Nusslein-Volhard C.

Genes controlling and mediating locomotion behavior of the zebrafish embryo and larva.

Development. 1996 Dec;123:399-413.

Odenthal J, Rossnagel K, Haffter P, Kelsh RN, Vogelsang E, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Mullins MC, Nusslein-Volhard C.

Mutations affecting xanthophore pigmentation in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:391-8.

Kelsh RN, Brand M, Jiang YJ, Heisenberg CP, Lin S, Haffter P, Odenthal J, Mullins MC, van Eeden FJ, Furutani-Seiki M, Granato M, Hammerschmidt M, Kane DA, Warga RM, Beuchle D, Vogelsang L, Nusslein-Volhard C.

Zebrafish pigmentation mutations and the processes of neural crest development.

Development. 1996 Dec;123:369-89.

Piotrowski T, Schilling TF, Brand M, Jiang YJ, Heisenberg CP, Beuchle D, Grandel H, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Hammerschmidt M, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Warga RM, Nusslein-Volhard C.

Jaw and branchial arch mutants in zebrafish II: anterior arches and cartilage differentiation.

Development. 1996 Dec;123:345-56.

Schilling TF, Piotrowski T, Grandel H, Brand M, Heisenberg CP, Jiang YJ, Beuchle D, Hammerschmidt M, Kane DA, Mullins MC, van Eeden FJ, Kelsh RN, Furutani-Seiki M, Granato M, Haffter P, Odenthal J, Warga RM, Trowe T, Nusslein-Volhard C.

Jaw and branchial arch mutants in zebrafish I: branchial arches.

Development. 1996 Dec;123:329-44.

Ransom DG, Haffter P, Odenthal J, Brownlie A, Vogelsang E, Kelsh RN, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Mullins MC, Nusslein-Volhard C.

Characterization of zebrafish mutants with defects in embryonic hematopoiesis.

Development. 1996 Dec;123:311-9.

Chen JN, Haffter P, Odenthal J, Vogelsang E, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Nusslein-Volhard C.

Mutations affecting the cardiovascular system and other internal organs in zebrafish.

Development. 1996 Dec;123:293-302.

van Eeden FJ, Granato M, Schach U, Brand M, Furutani-Seiki M, Haffter P, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Warga RM, Nusslein-Volhard C.

Genetic analysis of fin formation in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:255-62.

Whitfield TT, Granato M, van Eeden FJ, Schach U, Brand M, Furutani-Seiki M, Haffter P, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Nusslein-Volhard C.

Mutations affecting development of the zebrafish inner ear and lateral line.

Development. 1996 Dec;123:241-54.

Furutani-Seiki M, Jiang YJ, Brand M, Heisenberg CP, Houart C, Beuchle D, van Eeden FJ, Granato M, Haffter P, Hammerschmidt M, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Nusslein-Volhard C.

Neural degeneration mutants in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:229-39.

Jiang YJ, Brand M, Heisenberg CP, Beuchle D, Furutani-Seiki M, Kelsh RN, Warga RM, Granato M, Haffter P, Hammerschmidt M, Kane DA, Mullins MC, Odenthal J, van Eeden FJ, Nusslein-Volhard C.

Mutations affecting neurogenesis and brain morphology in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:205-16.

Heisenberg CP, Brand M, Jiang YJ, Warga RM, Beuchle D, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Hammerschmidt M, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Nusslein-Volhard C.

Genes involved in forebrain development in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:191-203.

Brand M, Heisenberg CP, Jiang YJ, Beuchle D, Lun K, Furutani-Seiki M, Granato M, Haffter P, Hammerschmidt M, Kane DA, Kelsh RN, Mullins MC, Odenthal J, van Eeden FJ, Nusslein-Volhard C.

Mutations in zebrafish genes affecting the formation of the boundary between midbrain and hindbrain.

Development. 1996 Dec;123:179-90.

van Eeden FJ, Granato M, Schach U, Brand M, Furutani-Seiki M, Haffter P, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Warga RM, Allende ML, Weinberg ES, Nusslein-Volhard C.

Mutations affecting somite formation and patterning in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:153-64.

Hammerschmidt M, Pelegri F, Mullins MC, Kane DA, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Heisenberg CP, Jiang YJ, Kelsh RN, Odenthal J, Warga RM, Nusslein-Volhard C.

Mutations affecting morphogenesis during gastrulation and tail formation in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:143-51.

Brand M, Heisenberg CP, Warga RM, Pelegri F, Karlstrom RO, Beuchle D, Picker A, Jiang YJ, Furutani-Seiki M, van Eeden FJ, Granato M, Haffter P, Hammerschmidt M, Kane DA, Kelsh RN, Mullins MC, Odenthal J, Nusslein-Volhard C.

Mutations affecting development of the midline and general body shape during zebrafish embryogenesis.

Development. 1996 Dec;123:129-42.

Odenthal J, Haffter P, Vogelsang E, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kane DA, Kelsh RN, Mullins MC, Warga RM, Allende ML, Weinberg ES, Nusslein-Volhard C.

Mutations affecting the formation of the notochord in the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:103-15.

Hammerschmidt M, Pelegri F, Mullins MC, Kane DA, van Eeden FJ, Granato M, Brand M, Furutani-Seiki M, Haffter P, Heisenberg CP, Jiang YJ, Kelsh RN, Odenthal J, Warga RM, Nusslein-Volhard C.

dino and mercedes, two genes regulating dorsal development in the zebrafish embryo.

Development. 1996 Dec;123:95-102.

Mullins MC, Hammerschmidt M, Kane DA, Odenthal J, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Heisenberg CP, Jiang YJ, Kelsh RN, Nusslein-Volhard C.

Genes establishing dorsoventral pattern formation in the zebrafish embryo: the ventral specifying genes.

Development. 1996 Dec;123:81-93.

Kane DA, Maischein HM, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Hammerschmidt M, Heisenberg CP, Jiang YJ, Kelsh RN, Mullins MC, Odenthal J, Warga RM, Nusslein-Volhard C.

The zebrafish early arrest mutants.

Development. 1996 Dec;123:57-66.

Kane DA, Hammerschmidt M, Mullins MC, Maischein HM, Brand M, van Eeden FJ, Furutani-Seiki M, Granato M, Haffter P, Heisenberg CP, Jiang YJ, Kelsh RN, Odenthal J, Warga RM, Nusslein-Volhard C.

The zebrafish epiboly mutants.

Development. 1996 Dec;123:47-55.

Haffter P, Granato M, Brand M, Mullins MC, Hammerschmidt M, Kane DA, Odenthal J, van Eeden FJ, Jiang YJ, Heisenberg CP, Kelsh RN, Furutani-Seiki M, Vogelsang E, Beuchle D, Schach U, Fabian C, Nusslein-Volhard C.

The identification of genes with unique and essential functions in the development of the zebrafish, *Danio rerio*.

Development. 1996 Dec;123:1-36.

Leingartner A, Heisenberg CP, Kolbeck R, Thoenen H, Lindholm D.

Brain-derived neurotrophic factor increases neurotrophin-3 expression in cerebellar granule neurons.

J Biol Chem. 1994 Jan 14;269(2):828-30.

Heisenberg CP, Cooper JD, Berke J, Sofroniew MV.

NMDA potentiates NGF-induced sprouting of septal cholinergic fibres.

Neuroreport. 1994 Jan 12;5(4):413-6.

Lindholm D, Dechant G, Heisenberg CP, Thoenen H.

Brain-derived neurotrophic factor is a survival factor for cultured rat cerebellar granule neurons and protects them against glutamate-induced neurotoxicity.

Eur J Neurosci. 1993 Nov 1;5(11):1455-64.

Lindholm D, Castren E, Tsoulfas P, Kolbeck R, Berzaghi Mda P, Leingartner A,

Heisenberg CP, Tessarollo L, Parada LF, et AL, et al.

Neurotrophin-3 induced by tri-iodothyronine in cerebellar granule cells promotes Purkinje cell differentiation.

J Cell Biol. 1993 Jul;122(2):443-50.

Heisenberg CP, Thoenen H, Lindholm D.

Tri-iodothyronine regulates survival and differentiation of rat cerebellar granule neurons.

Neuroreport. 1992 Aug;3(8):685-8.

### Book Chapters and Reviews

Asaoka Y, Morita H, Furumoto H, Heisenberg CP, Furutani-Seiki M.

Studying YAP-Mediated 3D Morphogenesis Using Fish Embryos and Human Spheroids.

Methods Mol Biol. 2019;1893:167-181.

Spiró Z, Heisenberg CP.

Regeneration Tensed Up: Polyploidy Takes the Lead.

Dev Cell. 2017 Sep 25;42(6):559-560.

Chan CJ, Heisenberg CP, Hiiragi T.  
Coordination of Morphogenesis and Cell-Fate Specification in Development.  
Curr Biol. 2017 Sep 25;27(18):R1024-R1035.

Petridou NI, Spiró Z, Heisenberg CP.  
Multiscale force sensing in development.  
Nat Cell Biol. 2017 May 31;19(6):581-588.

Heisenberg CP.  
D'Arcy Thompson's 'on Growth and form': From soap bubbles to tissue self-organization.  
Mech Dev. 2017 Apr 22.

Heisenberg CP.  
Cell biology: Stretched divisions.  
Nature. 2017 Mar 2;543(7643):43-44.

Schwayer C, Sikora M, Slovakova J, Kardos R, Heisenberg CP  
Actin rings of power  
Dev Cell 2016 Jun 20, 37(6):495-506.

Bollenbach T, Heisenberg CP.  
Gradients are shaping up.  
Cell. 2015 Apr 23;161(3):431-2.

Smutny M, Behrndt M, Campinho P, Ruprecht V, Heisenberg CP.  
UV laser ablation to measure cell and tissue-generated forces in the zebrafish embryo in vivo and ex vivo.  
Methods Mol Biol. 2015;1189:219-35.

Behrndt M, Heisenberg CP.  
Lateral junction dynamics lead the way out.  
Nat Cell Biol. 2014 Feb;16(2):127-9.

Campinho P, Heisenberg CP.  
The force and effect of cell proliferation.  
EMBO J. 2013 Oct 30;32(21):2783-4.

Maître JL, Heisenberg CP.  
Three functions of cadherins in cell adhesion.  
Curr Biol. 2013 Jul 22;23(14):R626-33.

Heisenberg CP, Bellaïche Y.  
Forces in Tissue Morphogenesis and Patterning.  
Cell. 2013 May 23;153(5):948-962.

- Morita H, Heisenberg CP.  
Holding on and letting go: cadherin turnover in cell intercalation.  
Dev Cell. 2013 Mar 25;24(6):567-9.
- Compagnon J, Heisenberg CP.  
Neurulation: coordinating cell polarisation and lumen formation.  
EMBO J. 2013 Jan 9;32(1):1-3.
- Tada M, Heisenberg CP.  
Convergent extension: using collective cell migration and cell intercalation to shape embryos.  
Development. 2012 Nov;139(21):3897-3904.
- Heisenberg CP, Fässler R.  
Cell-cell adhesion and extracellular matrix: diversity counts.  
Curr Opin Cell Biol. 2012 Oct 6. pii: S0955-0674(12)00141-X.
- Behrndt M, Heisenberg CP.  
Spurred by resistance: mechanosensation in collective migration.  
Dev Cell. 2012 Jan 17;22(1):3-4.
- Barone V, Heisenberg CP.  
Cell adhesion in embryo morphogenesis.  
Curr Opin Cell Biol. 2011 Dec 13.
- Maître JL, Heisenberg CP.  
The role of adhesion energy in controlling cell-cell contacts.  
Curr Opin Cell Biol. 2011 Oct;23(5):508-14.
- Krens G, Heisenberg CP.  
Cell sorting in development.  
Curr Top Dev Biol. 2011;95:189-213.
- Papusheva E, Heisenberg CP.  
Spatial organization of adhesion: force-dependent regulation and function in tissue morphogenesis.  
EMBO J. 2010 Aug 18;29(16):2753-68.
- Carvalho L, Heisenberg CP.  
The yolk syncytial layer in early zebrafish development.  
Trends Cell Biol. 2010 Oct;20(10):586-92.
- Paluch E, Heisenberg CP.  
Biology and physics of cell shape changes in development.  
Curr Biol. 2009 Sep 15;19(17):R790-9.

Heisenberg CP.  
Dorsal closure in Drosophila: cells cannot get out of the tight spot.  
Bioessays. 2009 Dec;31(12):1284-7.

Oates AC, Gorfinkiel N, González-Gaitán M, Heisenberg CP.  
Quantitative approaches in developmental biology.  
Nat Rev Genet. 2009 Aug;10(8):517-30.

Ulrich F, Heisenberg CP.  
Trafficking and cell migration.  
Traffic. 2009 Jul;10(7):811-8.

Paluch E, and Heisenberg CP  
Chaos begets Order: Asynchronous cell contractions drive epithelial morphogenesis  
Dev Cell. 2009 Jan;16(1):4-6.

Carvalho L, Heisenberg CP.  
Imaging zebrafish embryos by two-photon excitation time-lapse microscopy.  
Methods Mol Biol. 2009;546:273-87.

Heisenberg CP, and Solnica-Krezel L.  
Back and Forth between Cell Fate Specification and Movement during Vertebrate  
Gastrulation  
Curr Opin Genet Dev. 2008 Aug;18(4):311-6. Epub 2008 Sep 4.

Helenius J, Heisenberg CP, Gaub HE, Muller DJ.  
Single-cell force spectroscopy.  
J Cell Sci. 2008 Jun 1;121(Pt 11):1785-91.

Ulrich F and Heisenberg CP.  
Probing E-cadherin endocytosis by morpholino-mediated Rab5 knock-down in  
zebrafish.  
Methods Mol Biol. 2008;440:371-87.

Rohde L and Heisenberg CP.  
Zebrafish Gastrulation: Cell Movements, Signals and Mechanisms.  
Int Rev Cytol. 2007;261:159-92.

Castanon-Ortega I and Heisenberg CP  
A stern view of gastrulation.  
Nature Cell Biol. 2005 Jan;7:19.

Köppen M and Heisenberg CP  
Cleavage and gastrulation.  
Encyclopedia of Life Sciences. 2005.

Castanon-Ortega I and Heisenberg CP  
Cell migration during zebrafish gastrulation.  
In 'Cell Migration in Development and Disease', ed. Wedlich D,  
Wiley-VCH. 2004

Montero JA, Heisenberg CP.  
Gastrulation dynamics: cells move into focus.  
Trends Cell Biol. 2004 Nov;14(11):620-7.

Ulrich F and Heisenberg CP.  
Gastrulation in zebrafish.  
In 'Fish developmental biology and genetics', ed. Korzh V,  
World Scientific, Singapore. 2004

Montero JA, Heisenberg CP.  
Adhesive crosstalk during gastrulation  
Dev Cell. 2003 Aug;5(2):190-1.

Heisenberg CP, Tada M.  
Zebrafish gastrulation movements: bridging cell and developmental biology.  
Semin Cell Dev Biol. 2002 Dec;13(6):471-9.

Heisenberg CP.  
Wnt signalling: refocusing on Strabismus.  
Curr Biol. 2002 Oct 1;12(19):R657-9.

Tada M, Concha ML, Heisenberg CP.  
Non-canonical Wnt signalling and regulation of gastrulation movements.  
Semin Cell Dev Biol. 2002 Jun;13(3):251-60.

Heisenberg CP, Tada M.  
Wnt signalling: a moving picture emerges from van gogh.  
Curr Biol. 2002 Feb 19;12(4):R126-8.