BIOGRAPHICAL SKETCH

Alexander van Oudenaarden

PROFESSIONAL PREPARATION

Delft University of Technology, The Netherlands	Materials Science and Engineering	M.S. 1993
Delft University of Technology, The Netherlands	Physics	M.S. 1993
Delft University of Technology, The Netherlands	Physics	Ph.D. 1998
Stanford University, Stanford, CA	Biophysics	1998 - 1999

APPOINTMENTS

09/2012 – present	Director Hubrecht Institute for Developmental Biology and Stem Cell Research, the Royal Netherlands Academy of Arts and Sciences (KNAW) and University Medical Center Utrecht, Utrecht, The Netherlands.
01/2013 – present	Professor, Faculty of Science, Utrecht University, Utrecht, The Netherlands.
01/2013 – present	Professor, University Medical Center Utrecht, Utrecht, The Netherlands.
09/2009 – 01/2014	Extramural faculty member of the Koch Institute for Integrative Cancer Research at MIT, Cambridge, MA, USA.
05/2009 – 01/2014	Professor of Biology Department of Biology, Massachusetts Institute of Technology, Cambridge, MA, USA.
07/2008 – 01/2014	Professor of Physics Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, USA.
06/2008 – 01/2009	Visiting Professor Hubrecht Institute for Developmental Biology and Stem Cell Research, Utrecht, The Netherlands.
07/2004 – 06/2008	Associate Professor of Physics with tenure Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, USA.
01/2000 – 06/2004	Assistant Professor of Physics Department of Physics, Massachusetts Institute of Technology, Cambridge, MA, USA.
03/1998 – 12/1999	Postdoctoral research Department of Chemistry, Stanford University, Stanford, CA, USA. Laboratory of Prof. S.G. Boxer Micropatterning of supported phospholipid bilayers
03/1998 – 12/1999	Postdoctoral research Department of Biochemistry, Stanford, CA, USA. Laboratory of Prof. J.A. Theriot Force generation of polymerizing actin filaments

HONORS AND AWARDS

2017 Dutch Organization for Scientific Research (NWO) Spinoza Award
2017 EMBO member
2017 European Research Council (ERC) Advanced Grant
2015 Member of Koninklijke Hollandsche Maatschappij der Wetenschappen (KHMW)
2014 Member of the Royal Netherlands Academy of Arts and Sciences (KNAW)
2012 European Research Council (ERC) Advanced Grant
2012 Dutch Organization for Scientific Research (NWO) Vici Award
2008 NIH Director's Pioneer Award
2008 Guggenheim Fellow
2007 School of Science Prize for Excellence in Graduate Teaching
2001 Keck Career Development Professor in Biomedical Engineering
2001 Alfred Sloan Research Fellow
2001 NSF CAREER award
2000 Edgerly Science Partnership Award
1998 Andries Miedema Award for best Ph.D.-research in the field of condensed matter physics in the Netherlands, awarded every other year by Fundamental Research on Matter (FOM).
1998 Dutch Organization for Scientific Research (NWO) TALENT stipendium.
1998 Ph.D. Applied Physics, *cum laude*.
1994 Award for best undergraduate research in Materials Science, yearly award by Delft University of Technology.
1993 M.S. Materials Science and Engineering, *cum laude*.

OTHER EXPERIENCE

07/2015 – present	Member of National Scientific Advisory board, The Netherlands Cancer Institute (NKI)
05/2014 – present	Advisory editorial board member *Molecular Systems Biology*
01/2013 – present	Member of the Scientific Advisory Board of the European Molecular Biology Laboratory (EMBL)
01/2012 – present	Member of the Scientific Advisory Board of the Max Planck Institutes for Molecular Cell Biology and Genetics
09/2011 – present	Member of the Scientific Advisory Board of the Whitehead Institute for Biomedical Research
10/2009 – 07/2012	Director of the MIT Center for Single-Cell Dynamics in Cancer (NIH/NCI funded U54 Physical Sciences-Oncology Center). The goal of this center is use both theoretical and experimental approaches inspired by Physics to attack important problems in cancer biology by developing novel technology and analytical/computational methods to track the dynamics of cancer at the single cell level.
06/2007 – 12/2011	Organizer of CSB (Computational and Systems Biology) seminar series.
01/2005 – 12/2007	Associate Editor *Biophysical Journal*
06/2004 – 07/2006	Course Faculty at the Marine Biology Laboratory (Woods Hole) Summer Course *'Physiology: Modern Cell Biology Using Microscopic, Biochemical and Computational Approaches'*
09/2002 – 12/2009	Lecturer and creator of MIT Graduate course 7.81/8.591/9.531 Systems Biology.

PUBLICATION LIST

2018

J. C. Boisset, J. Vivié, D. Grün, M. Muraro, A. Lyubimova, and A. van Oudenaarden.
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Nature Methods, in press (2018).

L. Kester and A. van Oudenaarden.
Single-cell transcriptomics meets lineage tracing: best of both worlds.
Cell Stem Cell, in press (2018).

N. C. Rivron, J. Frias-Aldeguer, E. Vrij, J. C. Boisset, J. Korving, J. Vivié, R. Truckenmüller, A. van Oudenaarden, C. A. van Blitterswijk, and N. Geijsen.
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Nature **557**, 106-111 (2018).

C. G. Engert, R. Droste, A. van Oudenaarden, and H. R. Horvitz.
A *C. elegans* protein with a PRDM9-like SET domain localizes to chromatin-associated foci and promotes spermatocyte gene expression, sperm production and fertility.
PLoS Genetics **14**: e1007295 (2018).

A. Alemany, M. Florescu, C. S. Baron, J. Peterson-Maduro, and A. van Oudenaarden.
Whole-organism clone tracing using single-cell sequencing.
Nature **556**, 108-112 (2018).

C. J. M. Loomans, N. Williams Giuliani, J. Balak, F. Ringnalda, L. van Gurp, M. Huch, S. F. Boj, T. Sato, L. Kester, S. M. C. de Sousa Lopes, M. S. Roost, S. Bonner-Weir, M. A. Engelse, T. J. Rabelink, H. Heimberg, R. G. J. Vries, A. van Oudenaarden, F. Carlotti, H. Clevers, and E. J. P. de Koning.
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M. M. Gladka, B. Molenaar, H. de Ruiter, D. Versteeg, G. P. A. Lacraz, S. van der Elst, M. M. H. Huibers, A. van Oudenaarden, and E. van Rooij.
Single-cell sequencing of the healthy and diseased heart reveals Ckap4 as a new modulator of fibroblasts activation.
Circulation, doi: 10.1161/CIRCULATIONAHA.117.030742 (2018).

O. Basak, T. G. Krieger, M. J. Muraro, K. Wiebrands, D. E. Stange, J. Frias-Aldeguer, N. C. Rivron, M. van de Wetering, J. H. van Es, A. van Oudenaarden, B. D. Simons, and H. Clevers.
Troy+ brain stem cells cycle through quiescence and regulate their number by sensing niche occupancy.
PNAS **115**, E610-E619 (2018).

2017

B. Artegiani, A. Lyubimova, M. Muraro, J. H. van Es, A. van Oudenaarden, and H. Clevers.
A single-cell RNA sequencing study reveals cellular and molecular dynamics of the hippocampal neurogenic niche.
Cell Reports **21**, 3271-3284 (2017).

The human cell atlas.
A. Regev, S. A. Teichmann, E. S. Lander, I. Amit, C. Benoist, E. Birney, B. Bodenmiller, P. Campbell, P. Carninci, M. Clatworthy, H. Clevers, B. Deplancke, I. Dunham, J. Eberwine, R. Eils, W. Enard, A. Farmer, L. Fugger, B. Göttgens, N. Hacohen, M. Haniffa, M. Hemberg, S. Kim, P. Klenerman, A. Kriegstein, E. Lein, S. Linnarsson, E. Lundberg, J. Lundeberg, P. Majumder, J. C. Marioni, M. Merad, M. Mhlanga, M. Nawijn, M. Netea, G. Nolan, D. Pe'er, A. Phillipakis, C. P. Ponting, S. Quake, W. Reik, O. Rozenblatt-Rosen, J. Sanes, R. Satija, T. N. Schumacher, A. Shalek, E. Shapiro, P. Sharma, J. W. Shin, O. Stegle, M. Stratton, M. J. T. Stubbington, F. J. Theis, M. Uhlen, A. van Oudenaarden, A. Wagner, F. Watt, J. Weissman, B. Wold, R. Xavier, N. Yosef, and Human Cell Atlas Meeting Participants.
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Dynamics of lineage commitment revealed by single-cell transcriptomics of differentiating embryonic stem cells
S. Semrau, J. E. Goldmann, M. Soumillon, T. S. Mikkelsen, R. Jaenisch, and A. van Oudenaarden.
Nature Communications 10.1038/s41467-017-01076-4 (2017).

S. C. van den Brink, F. Sage F, Á. Vértesy, B. Spanjaard, J. Peterson-Maduro, C. S. Baron, C. Robin, and A. van Oudenaarden.
Single-cell sequencing reveals dissociation-induced gene expression in tissue subpopulations.
Nature Methods **14**, 935-936 (2017).

G. P. A. Lacraz, J. P. Junker, M. M. Gladka, B. Molenaar, K. T. Scholman, M. Vigil-Garcia, D. Versteeg, H. de Ruiter, M. W. Vermunt, M. P. Creyghton, M. M. H. Huibers, N. de Jonge, A. van Oudenaarden, and E. van Rooij.
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J. den Hertog and A. van Oudenaarden.
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P. Dierickx, M. W. Vermunt, M. J. Muraro, M. P. Creyghton, P. A. Doevendans, A. van Oudenaarden, N. Geijsen, and L. W. van Laake.
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C. L. Scheele, E. Hannezo, M. J. Muraro, A. Zomer, N. S. Langedijk, A. van Oudenaarden, B. D. Simons, and J. van Rheenen.

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C. Adolphe, J. P. Junker, A. Lyubimova, A. van Oudenaarden, and B. Wainwright.
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O. Basak, J. Beumer, K. Wiebrands, H. Seno, A. van Oudenaarden, and H. Clevers.
Induced quiescence of Lgr5+ stem cells in intestinal organoids enables differentiation of hormone-producing enteroendocrine cells.
Cell Stem Cell **20**, 177-190 (2017).

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S. Amin, R. Neijts, S. Simmini, C. van Rooijen, S. C. Tan, L. Kester, A. van Oudenaarden, M. P. Creyghton, and J. Deschamps.
Cdx and T Brachyury co-activate growth signaling in the embryonic axial progenitor niche.
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D. A. Jaitin, A. Weiner, I. Yofe, D. Lara-Astiaso, H. Keren-Shaul, E. David, T. M. Salame, A. Tanay, A. van Oudenaarden, and I. Amit.
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M. J. Muraro, G. Dharmadhikari, D. Grün, N. Groen, T. Dielen, E. Jansen, L. van Gurp, M. A. Engelse, F. Carlotti, E. J. de Koning, and A. van Oudenaarden.
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N. Sasaki, N. Sachs, K. Wiebrands, S. I. Ellenbroek, A. Fumagalli, A. Lyubimova, H. Begthel, M. van den Born, J. H. van Es, W. R. Karthaus, V. S. Li, C. López-Iglesias, P. J. Peters, J. van Rheenen, A. van Oudenaarden, and H. Clevers.
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F. Kruse, J. P. Junker, A. van Oudenaarden, and J. Bakkers.
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D. Mooijman, S. S. Dey, J. C. Boisset, N. Crosetto, and A. van Oudenaarden.
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D. Grün, M. J. Muraro, J. C. Boisset, K. Wiebrands, A. Lyubimova, G. Dharmadhikari, M. van den Born, J. van Es, E. Jansen, H. Clevers, E. J. P. de Koning, and A. van Oudenaarden.
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E. Beerling, D. Seinstra, E. de Wit, L. Kester, D. van der Velden, C. Maynard, R. Schäfer, P. van Diest, E. Voest, A. van Oudenaarden, N. Vrisekoop, and J. van Rheenen.
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P. W. Tetteh, O. Basak, H. F. Farin, K. Wiebrands, K. Kretzschmar, H. Begthel, M. van den Born, J. Korving, F. de Sauvage, J. H. van Es, A. van Oudenaarden, and H. Clevers.
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C. C. Wu, F. Kruse, M. D. Vasudevarao, J. P. Junker, D. C. Zebrowski, K. Fischer, E. S. Noël, D. Grün, E. Berezikov, F. B. Engel, A. van Oudenaarden, G. Weidinger, and J. Bakkers.
Spatially resolved genome-wide transcriptional profiling identifies BMP signaling as essential regulator of zebrafish cardiomyocyte regeneration.
Developmental Cell **36**, 36 – 49 (2016).

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S. Semrau and A. van Oudenaarden.
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Annual Review Cell and Developmental Biology **13**, 317 – 345 (2015).

D. Grün and A. van Oudenaarden.
Design and analysis of single-cell sequencing experiments.
Cell **163**, 799 – 810 (2015).

N. Slavov, S. Semrau, E. Airoldi, B. Budnik, and Oudenaarden.
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Cell Reports **13**, 865 – 873 (2015).

D. Grün, A. Lyubimova, L. Kester, K. Wiebrands, O. Basak, N. Sasaki, H. Clevers, and A. van Oudenaarden.
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Nature **525**, 251 – 255 (2015).

Y. Q. Soh, J. P. Junker, M. E. Gill, J. L. Mueller, A. van Oudenaarden, and D. C. Page.
A gene regulatory program for meiotic prophase in the fetal ovary.
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J. Kind, L. Pagie, S. S. de Vries, L. Nahidiazar, S. S. Dey, M. Bienko, Y. Zhan, B. Lajoie, C. A. de Graaf, M. Amendola, G. Fudenberg, M. Imakaev, L. A. Mirny, K. Jalink, J. Dekker, A. van Oudenaarden, and B. van Steensel.
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Cell **163**, 134 – 147 (2015).

M. Welling, H. H. Chen, J. Muñoz, M. U. Musheev, L. Kester, J. P. Junker, N. Mischerikow, M. Arbab, E. Kuijk, L. Silberstein, P. V. Kharchenko, M. Geens, C. Niehrs, H. van de Velde, A. van Oudenaarden, A. J. Heck, and N. Geijsen.
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EMBO Reports **16**, 791 – 802 (2015).

J. P. Junker and A. van Oudenaarden.
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Molecular Cell **58**, 563 – 564 (2015).

J. S. van Zon, S. Kienle, G. Huelsz-Prince, M. Barkoulas, and A. van Oudenaarden.
Cells change their sensitivity to an EGF morphogen gradient to control EGF-induced gene expression.
Nature Communications **6**:7053. doi: 10.1038/ncomms8053 (2015).

M. van de Wetering, H. E. Francies, J. M. Francis, G. Bounova, F. Iorio, A. Pronk, W. van Houdt, J. van Gorp, A. Taylor-Weiner, L. Kester, A. McLaren-Douglas, J. Blokker, S. Jaksani, S. Bartfeld, R. Volckman, P. van Sluis, V. S. Li, S. Seepo, C. Sekhar Pedamallu, K. Cibulskis, S. L. Carter, A. McKenna, M. S. Lawrence, L. Lichtenstein, C. Stewart, J. Koster, R. Versteeg, A. van Oudenaarden, J. Saez-Rodriguez, R. G. Vries, G. Getz, L. Wessels, M. R. Stratton, U. McDermott, M. Meyerson, M. J. Garnett, and H. Clevers.
Prospective derivation of a living organoid biobank of colorectal cancer patients.
Cell **161**, 933 – 945 (2015).

J. M. Schmiedel, S. L. Klemm, Y. Zheng, A. Sahay, N. Blüthgen, D. S. Marks, and A. van Oudenaarden.
MicroRNA control of protein expression noise.
Science **348**, 128 – 132 (2015).

Y. C. Hu, P. K. Nicholls, Y. Q. Soh, J. R. Daniele, J. P. Junker, A. van Oudenaarden, and D. C. Page.
Licensing of primordial germ cells for gametogenesis depends on genital ridge signaling.
PLoS Genetics **11**:e1005019. doi: 10.1371/journal.pgen.1005019 (2015).

J. Schuijers, J. P. Junker, M. Mokry, P. Hatzis, B. K. Koo, V. Sasselli, L. G. van der Flier, E. Cuppen, A. van Oudenaarden, and H. Clevers.
Ascl2 acts as an R-spondin/Wnt-responsive switch to control stemness in intestinal crypts.
Cell Stem Cell **16**, 158 – 170 (2015).

S. S. Dey, L. Kester, B. Spanjaard, M. Bienko, and A. van Oudenaarden.
Integrated genome and transcriptome sequencing of the same cell.
Nature Biotechnology **33**, 285 – 289 (2015).

N. Crosetto, M. Bienko, and A. van Oudenaarden.
Spatially resolved transcriptomics and beyond.
Nature Reviews Genetics **16**, 57 – 66 (2015).

2014

S. Simmini, M. Bialecka, M. Huch, L. Kester, M. van de Wetering, T. Sato, F. Beck, A. van Oudenaarden, H. Clevers, and J. Deschamps.
Transformation of intestinal stem cells into gastric stem cells on loss of transcription factor Cdx2.
Nature Communications doi: 10.1038/ncomms6728 (2014).

J. P. Junker, K. A. Peterson, Y. Nishi, J. Mao, A. P. McMahon, and A. van Oudenaarden.
A predictive model of bifunctional transcription factor signaling during embryonic tissue patterning.
Developmental Cell **31**, 448 – 460 (2014).

J. P. Junker, E. S. Noël, V. Guryev, K. A. Peterson, G. Shah, J. Huisken, A. P. McMahon, E. Berezikov, J. Bakkers, and A. van Oudenaarden.
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Cell **159**, 662 – 675 (2014).

R. A. Mentink, T. C. Middelkoop, L. Rella, N. Ji, C. Y. Tang, M. C. Betist, A. van Oudenaarden, H. C. Korswagen.
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Developmental Cell **31**, 188 – 201 (2014).

A. Barreca, C. Martinengo, L. Annaratone, L. R., A. Chiappella, M. Ladetto, A. Demurtas, L. Chiusa, A. Stacchini, N. Crosetto, A. van Oudenaarden, and R. Chiarle.
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N. Slavov, B. A. Budnik, D. Schwab, E. Airoldi, and A. van Oudenaarden.
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D. Grün, L. Kester, and A. van Oudenaarden.
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Nature Methods **11**, 637 – 640 (2014).

S. Klemm, S. Semrau, K. Wiebrands, D. Mooijman, D. Faddah, R. Jaenisch, and A. van Oudenaarden.
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J. P. Junker and A. van Oudenaarden.
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Cell **157**, 8 – 11 (2014).

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Cell Reports **6**, 514 – 527 (2014).

V. Almendro, H. Kim, Y. K. Cheng, M. Gonen, S. Itzkovitz, P. Argani, A. van Oudenaarden, S. Sukumar, F. Michor, and K. Polyak.
Genetic and phenotypic diversity in breast tumor metastases.
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J. R. Alvarez-Dominguez, W. Hu, B. Yuan, J. Shi, S. S. Park, A. A. Gromatzky, A. van Oudenaarden, and H. F. Lodish.
Global discovery of erythroid long noncoding RNAs reveals novel regulators of red cell maturation.
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S. Semrau, N. Crosetto, M. Bienko, M. Boni, P. Bernasconi, R. Chiarle, and A. van Oudenaarden.
FuseFISH: Robust detection of transcribed gene fusions in single cells.
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2013

N. Ji, T. C. Middelkoop, R. A. Mentink, M. C. Betist, S. Tonegawa, D. Mooijman, H. C. Korswagen, and A. van Oudenaarden.
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Cell **155**, 869 – 880 (2013).

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D. H. Kim, D. Gruen, and A. van Oudenaarden.
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A. Lyubimova, S. Itzkovitz, J. P. Junker, Z. P. Fan, X. Wu, and A. van Oudenaarden.
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Science **339**, 584 – 587 (2013).

M. Barkoulas, J. S. van Zon, J. Milloz, A. van Oudenaarden, and M. A. Félix.
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2012

K. A. Peterson, Y. Nishi, W. Ma, A. Vedenko, L. Shokri, X. Zhang, M. McFarlane, J. M. Baizabal, J. P. Junker, A. van Oudenaarden, T. Mikkelsen, B. E. Bernstein, T. L. Bailey, M. L. Bulyk, W. H. Wong, and A. P. McMahon.
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Oudenaarden, and H. Clevers.
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