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

2022 Member of the American Academy of Arts and Sciences
2021 European Research Council (ERC) Advanced Grant
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

09/2018 – present	Member of advisory board of Single Cell Discoveries B.V.
07/2015 – present	Member of national scientific advisory board, The Netherlands Cancer Institute (NKI)
09/2014 – present	Member of organizing committee Single Cell Genomics, yearly conference
05/2014 – present	Advisory editorial board member *Molecular Systems Biology*
01/2013 – 12/2018	Member of the scientific advisory board of the European Molecular Biology Laboratory (EMBL)
01/2011 – 12/2019	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

2023

J. Yeung, M. Florescu, P. Zeller, B.A. de Barbanson, M.D. Wellenstein, A. van Oudenaarden.
scChIX-seq infers dynamic relationships between histone modifications in single cells
Nature Biotechnology, doi: 10.1038/s41587-022-01560-3, online ahead of print (2023)

2022

P. Zeller, J. Yeung, H. Viñas Gaza, B.A. de Barbanson, V. Bhardwaj, M. Florescu, R. van der Linden, A. van Oudenaarden.
Single-cell sortChIC identifies hierarchical chromatin dynamics during hematopoiesis
Nature Genetics, doi: 10.1038/s41588-022-01260-3, online ahead of print (2022)

F. Salmen, J. De Jonghe, T.S. Kaminski, A. Alemany, G.E. Parada, J. Verity-Legg, A. Yanagida, T.N. Kohler, N. Battich, F. van den Brekel, A.L. Ellermann, A. Martinez Arias, J. Nichols, M. Hemberg, F. Hollfelder, A. van Oudenaarden.
High-throughput total RNA sequencing in single cells using VASA-seq
Nature Biotechnology **40**, 1780-1793 (2022)

W. van Leeuwen, M. VanInsberghe, N. Battich, F. Salmén, A. van Oudenaarden, C. Rabouille.
Identification of the stress granule transcriptome via RNA-editing in single cells and in vivo
Cell Rep Methods **2**, 100235 (2022)

L. Kester, B. de Barbanson, A. Lyubimova, L.T. Chen, V. van der Schrier, A. Alemany, D. Mooijman, J. Peterson-Maduro, J. Drost, J. de Ridder, A. van Oudenaarden.
Integration of multiple lineage measurements from the same cell reconstructs parallel tumor evolution
Cell Genomics **2**, 100096 (2022)

J. Beumer, J. Puschhof, F.Y. Yengej, L. Zhao, A. Martinez-Silgado, M. Blotenburg, H. Begthel, C. Boot, A. van Oudenaarden, Y.G. Chen, H. Clevers.
BMP gradient along the intestinal villus axis controls zonated enterocyte and goblet cell states
Cell Rep **38**, 110438 (2022)

C.J. Boogerd, G.P.A. Lacraz, A. Vértesy, S.J. van Kampen, I. Perini, H. de Ruiter, D. Versteeg, A. Brodehl, P. van der Kraak, M. Giacca, N. de Jonge, J.P. Junker, A. van Oudenaarden, A. Vink, E. van Rooij.
Spatial transcriptomics unveils ZBTB11 as a regulator of cardiomyocyte degeneration in arrhythmogenic cardiomyopathy
Cardiovasc Res., doi: 10.1093/cvr/cvac072, online ahead of print (2022)

J. Seong, J. Frias-Aldeguer, V. Holzmann, H. Kagawa, G. Sestini, H. Heidari Khoei, Y. Scholte Op Reimer, M. Kip, S.J. Pradhan, L. Verwegen, J. Vivié, L. Li, A. Alemany, J.

Korving, F. Darmis, A. van Oudenaarden, D. Ten Berge, N. Geijsen, N.C. Rivron.
Epiblast inducers capture mouse trophectoderm stem cells in vitro and pattern blastoids for implantation in utero
Cell Stem Cell **29**, 1102-1118 (2022)

L. Kester, D. Seinstra, A.G.J. van Rossum, C. Vennin, M. Hoogstraat, D. van der Velden, M. Opdam, E. van Werkhoven, K. Hahn, I. Nederlof, E.H. Lips, I.A.M. Mandjes, A.E. van Leeuwen-Stok, S. Canisius, H. van Tinteren, A.L.T. Imholz, J.E.A. Portielje, M.E.M.M. Bos, S.D. Bakker, E.J. Rutgers, H.M. Horlings, J. Wesseling, E.E. Voest, L.F.A. Wessels, M. Kok, H.M. Oosterkamp, A. van Oudenaarden, S.C. Linn, J. van Rheenen.
Differential Survival and Therapy Benefit of Patients with Breast Cancer Are Characterized by Distinct Epithelial and Immune Cell Microenvironments
Clin Cancer Res **28**, 960-971 (2022)

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M. VanInsberghe, J. van den Berg, A. Andersson-Rolf, H. Clevers, A. van Oudenaarden.
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Nature **597**, 561-565 (2021)

S.C. van den Brink, A van Oudenaarden.
3D gastruloids: a novel frontier in stem cell-based in vitro modeling of mammalian gastrulation
Trends Cell Biol. **31**, 747-759 (2021)

S.P. Methot, J. Padeken, G. Brancati, P. Zeller, C.E. Delaney, D. Gaidatzis, H. Kohler, A. van Oudenaarden, H. Großhans, S.M. Gasser.
H3K9me selectively blocks transcription factor activity and ensures differentiated tissue integrity
Nat Cell Biol. **23**, 1163-1175 (2021)

M. Sen, D. Mooijman, A. Chialastri, J.C. Boisset, M. Popovic, B. Heindryckx, S.M. Chuva de Sousa Lopes , S.S. Dey, A. van Oudenaarden.
Strand-specific single-cell methylomics reveals distinct modes of DNA demethylation dynamics during early mammalian development
Nature Communications **12**, 1286 (2021)

G.A. Busslinger, B. de Barbanson, R. Oka, B.L.A. Weusten, M. de Maat, R. van Hillegersberg, L.A.A. Brosens, R. van Boxtel, A. van Oudenaarden, H. Clevers.
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Proc Natl Acad Sci USA **118**, e2113061118 (2021)

N. Groen, F. Leenders, A. Mahfouz, A. Munoz-Garcia, M.J. Muraro, N. de Graaf, T.J. Rabelink, R. Hoeben, A. van Oudenaarden, A. Zaldumbide, M.J.T. Reinders, E.J.P. Koning, F. Carlotti
Single-Cell Transcriptomics Links Loss of Human Pancreatic β-Cell Identity to ER Stress
Cells **10**, 3585 (2021)

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N. Rajewsky, G. Almouzni, S.A. Gorski, S. Aerts, I. Amit, M.G. Bertero, C. Bock, A.L. Bredenoord, G. Cavalli, S. Chiocca, H. Clevers, B. De Strooper, A. Eggert, J. Ellenberg, X.M. Fernández, M. Figlerowicz, S.M. Gasser, N. Hubner, J. Kjems, J.A. Knoblich, G. Krabbe, P. Lichter, S. Linnarsson, J.C. Marine, J. Marioni, M.A. Marti-Renom, M.G. Netea, D. Nickel, M. Nollmann, H.R. Novak, H. Parkinson, S. Piccolo, I. Pinheiro, A. Pombo, C. Popp, W. Reik, S. Roman-Roman, P. Rosenstiel, J.L. Schultze, O. Stegle, A. Tanay, G. Testa, D. Thanos, F.J. Theis, M.E. Torres-Padilla, A. Valencia, C. Vallot, A. van Oudenaarden, M. Vidal, T. Voet; LifeTime Community.
LifeTime and improving European healthcare through cell-based interceptive medicine.
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S.C. van den Brink, A. Alemany, V. van Batenburg, N. Moris, M. Blotenburg, J. Vivié, P. Baillie-Johnson, J. Nichols, K.F. Sonnen, A. Martinez Arias, A. van Oudenaarden.
Single-cell and spatial transcriptomics reveal somitogenesis in gastruloids.
Nature **582***,* 405-409 (2020)

Y. Post, J. Puschhof, J. Beumer, H.M. Kerkkamp, M.A.G. de Bakker, J. Slagboom, B. de Barbanson, N.R. Wevers, X.M. Spijkers, T. Olivier, T.D. Kazandjian, S. Ainsworth, C.L. Iglesias, W.J. van de Wetering, M.C. Heinz, R.L. van Ineveld, R.G.D.M. van Kleef, H. Begthel, J. Korving, Y.E. Bar-Ephraim, W. Getreuer, A.C. Rios, R.H.S. Westerink, H.J.G. Snippert, A. van Oudenaarden, P.J. Peters, F.J. Vonk, J. Kool, M.K. Richardson, N.R. Casewell, H. Clevers.
Snake Venom Gland Organoids.
Cell **182**, 233-247 (2020)

N. Moris, K. Anlas, S.C. van den Brink, A. Alemany, J. Schröder, S. Ghimire, T. Balayo, A. van Oudenaarden, A. Martinez Arias.
An in vitro model of early anteroposterior organization during human development.
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N. Battich, J. Beumer, B. de Barbanson, L. Krenning, C.S. Baron, M.E. Tanenbaum, H. Clevers, A. van Oudenaarden.
Sequencing metabolically labeled transcripts in single cells reveals mRNA turnover strategies.
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2019

H. Honkoop, D.E. de Bakker, A. Aharonov, F. Kruse, A. Shakked, P.D. Nguyen, C. de Heus, L. Garric, M.J. Muraro, A. Shoffner, F. Tessadori, J.C. Peterson, W. Noort, A. Bertozzi, G. Weidinger, G. Posthuma, D. Grun, W.J. van der Laarse, J. Klumperman, R.T. Jaspers, K.D. Poss, A. van Oudenaarden, E. Tzahor, J. Bakkers.
Single-cell analysis uncovers that metabolic reprogramming by ErbB2 signaling is essential for cardiomyocyte proliferation in the regenerating heart.
Elife **8**, doi: 10.7554/eLife.50163 (2019).

J.H. van Es, K. Wiebrands, C. López-Iglesias, M. van de Wetering, L. Zeinstra, M. van den Born, J. Korving, N. Sasaki, P.J. Peters, A. van Oudenaarden, H. Clevers.
Enteroendocrine and tuft cells support Lgr5 stem cells on Paneth cell depletion.
Proc Natl Acad Sci U S A **116***,* 26599-26605 (2019).

C.S. Baron, A. van Oudenaarden.
Unravelling cellular relationships during development and regeneration using genetic lineage tracing.
Nat Rev Mol Cell Biol. **20**, 753-765 (2019).

C.S. Baron, A. Barve, M.J. Muraro, R. van der Linden, G. Dharmadhikari, A. Lyubimova, E.J.P. de Koning, and A. van Oudenaarden.
Cell type purification by single-cell transcriptome-trained sorting.
Cell **179**, 527-542 (2019).

L. van Gurp, M.J. Muraro, T. Dielen, L. Seneby, G. Dharmadhikari, G. Gradwohl, A. van Oudenaarden, and E.J.P. de Koning.
A transcriptomic roadmap to α- and β-cell differentiation in the embryonic pancreas.
Development **146**, doi: 10.1242/dev.173716 (2019).

B. Etemad, A. Vertesy, T.E.F. Kuijt, C. Sacristan, A. van Oudenaarden, and G.J.P.L. Kops.
Spindle checkpoint silencing at kinetochores with submaximal microtubule occupancy.
Journal of Cell Science **132,** doi: 10.1242/jcs.231589 (2019).

B.J. Pepe-Mooney, M.T. Dill, A. Alemany, J. Ordovas-Montanes, Y. Matsushita, A. Rao, A. Sen, M. Miyazaki, S. Anakk, P.A. Dawson, N. Ono, A.K. Shalek, A. van Oudenaarden, and F.D. Camargo.
Single-Cell Analysis of the Liver Epithelium Reveals Dynamic Heterogeneity and an Essential Role for YAP in Homeostasis and Regeneration.
Cell Stem Cell **25**, 23-38 (2019).

E. Driehuis, S. Kolders, S. Spelier, K. Lõhmussaar, S.M. Willems, L.A. Devriese, R. de Bree, E.J. de Ruiter, J. Korving, H. Begthel, J.H. van Es, V. Geurts, G.W. He, R.H. van Jaarsveld, R. Oka, M.J. Muraro, J. Vivié, M.M.J.M. Zandvliet, A.P.A. Hendrickx, N. Iakobachvili, P. Sridevi, O. Kranenburg, R. van Boxtel, G.J.P.L. Kops, D.A. Tuveson, P.J. Peters, A. van Oudenaarden, and H. Clevers.
Oral Mucosal Organoids as a Potential Platform for Personalized Cancer Therapy.
Cancer Discovery **9**, 852-871 (2019).

A.C.F. Bolhaqueiro, B. Ponsioen, B. Bakker, S.J. Klaasen, E. Kucukkose, R.H. van Jaarsveld, J. Vivié, I. Verlaan-Klink, N. Hami, D.C.J. Spierings, N. Sasaki, D. Dutta, S.F. Boj, R.G.J. Vries, P.M. Lansdorp, M. van de Wetering, A. van Oudenaarden, H. Clevers, O. Kranenburg, F. Foijer, H.J.G. Snippert, and G.J.P.L. Kops.
Ongoing chromosomal instability and karyotype evolution in human colorectal cancer organoids.
Nature Genetics **51**, 824-834 (2019).

O. Kopper, C.J. de Witte, K. Lõhmussaar, J.E. Valle-Inclan, N. Hami, L. Kester, A.V. Balgobind, J. Korving, N. Proost, H. Begthel, L.M. van Wijk, S.A. Revilla, R. Theeuwsen, M. van de Ven, M.J. van Roosmalen, B. Ponsioen, V.W.H. Ho, B.G. Neel, T. Bosse, K.N. Gaarenstroom, H. Vrieling, M.P.G. Vreeswijk, P.J. van Diest, P.O. Witteveen, T. Jonges, J.L. Bos, A. van Oudenaarden, R.P. Zweemer, H.J.G. Snippert, W.P. Kloosterman, and H. Clevers.
An organoid platform for ovarian cancer captures intra- and interpatient heterogeneity.
Nature Medicine **25**, 838-849 (2019).

J.P. Gerlach, J.A.G. van Buggenum, S.E.J. Tanis, M. Hogeweg, B.M.H. Heuts, M.J. Muraro, L. Elze, F. Rivello, A. Rakszewska, A. van Oudenaarden, W.T.S. Huck, H.G. Stunnenberg, and K.W. Mulder.
Combined quantification of intracellular (phospho-)proteins and transcriptomics from fixed single cells.
Scientific Reports **9**, doi: 10.1038/s41598-018-37977-7 (2019).

A. Attardi, T. Fulton, M. Florescu, G. Shah, L. Muresan, M.O. Lenz, C. Lancaster, J. Huisken, A. van Oudenaarden, and B. Steventon.
Correction: Neuromesodermal progenitors are a conserved source of spinal cord with divergent growth dynamics.
Development **146**, doi: 10.1242/dev.175620 (2019).

N. Sachs, A. Papaspyropoulos, D.D. Zomer-van Ommen, I. Heo, L. Böttinger, D. Klay, F. Weeber, G. Huelsz-Prince, N. Iakobachvili, G.D. Amatngalim, J. de Ligt, A. van Hoeck, N. Proost, M.C. Viveen, A. Lyubimova, L. Teeven, S. Derakhshan, J. Korving, H. Begthel, J.F. Dekkers, K. Kumawat, E. Ramos, M.E. van Oosterhout, G.J. Offerhaus, D.J. Wiener, E.P. Olimpio, K.K. Dijkstra, E.F. Smit, M. van der Linden, S. Jaksani, M. van de Ven, J. Jonkers, A.C. Rios, E.E. Voest, C.H. van Moorsel, C.K. van der Ent, E. Cuppen, A. van Oudenaarden, F.E. Coenjaerts, L. Meyaard, L.J. Bont, P.J. Peters, S.J. Tans, J.S. van Zon, S.F. Boj, R.G. Vries, J.M. Beekman, and H. Clevers.
Long-term expanding human airway organoids for disease modeling.
EMBO Journal **38,** doi: 10.15252/embj.2018100300 (2019).

2018

P.E. Boulais, T. Mizoguchi, S. Zimmerman, F. Nakahara, J. Vivié, J.C. Mar, A. van Oudenaarden, and P. Frenette.
The Majority of CD45 Ter119 CD31 Bone Marrow Cell Fraction Is of Hematopoietic Origin and Contains Erythroid and Lymphoid Progenitors
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A. Ebbing, A. Vértesy, M.C. Betist, B. Spanjaard, J.P. Junker, E. Berezikov, A. van Oudenaarden, and H.C. Korswagen.
Spatial Transcriptomics of C. elegans Males and Hermaphrodites Identifies Sex-Specific Differences in Gene Expression Patterns
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A. Attardi, T. Fulton, M. Florescu, G. Shah, L. Muresan, M.O. Lenz, C. Lancaster, J. Huisken, A. van Oudenaarden, and B. Steventon.
Neuromesodermal progenitors are a conserved source of spinal cord with divergent growth dynamics
Development **145**, doi: 10.1242/dev.166728 (2018).

F. Wimmers, N. Subedi, N. van Buuringen, D. Heister, J. Vivié, I. Beeren-Reinieren, R. Woestenenk, H. Dolstra, A. Piruska, J.F.M. Jacobs, A. van Oudenaarden, C.G. Figdor, W.T.S. Huck, I.J.M. de Vries, and J. Tel.
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E. F. Roovers, L. J. T. Kaaij, S. Redl, A. W. Bronkhorst, K. Wiebrands, A. M. de Jesus Domingues, H. Y. Huang, C. T. Han, S. Riemer, R. Dosch, W. Salvenmoser, D. Grün, F. Butter, A. van Oudenaarden, and R. F. Ketting.
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C. S. Baron, L. Kester, A. Klaus, J. C. Boisset, R. Thambyrajah, L. Yvernogeau, V. Kouskoff, G. Lacaud, A. van Oudenaarden, and C. Robin.
Single-cell transcriptomics reveal the dynamic of haematopoietic stem cell production in the aorta.
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J. C. Boisset, J. Vivié, D. Grün, M. J. Muraro, A. Lyubimova, and A. van Oudenaarden.
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L. Kester and A. van Oudenaarden.
Single-cell transcriptomics meets lineage tracing: best of both worlds.
Cell Stem Cell **23**, 166-179 (2018).

Á. Vértesy, W. Arindrarto, M. S. Roost, B. Reinius, V. Torrens-Juaneda, M. Bialecka, I. Moustakas, Y. Ariyurek, E. Kuijk, H. Mei, R. Sandberg, A. van Oudenaarden, and S. M. Chuva de Sousa Lopes.
Parental haplotype-specific single-cell transcriptomics reveal incomplete epigenetic reprogramming in human female germ cells.
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C. G. Engert, R. Droste, A. van Oudenaarden, and H. R. Horvitz.
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A. Alemany, M. Florescu, C. S. Baron, J. Peterson-Maduro, and A. van Oudenaarden.
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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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2017

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The human cell atlas.
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