CURRICULUM VITAE

Name	Johannes Carolus Clevers
Address	Singel 34, 1015 AA Amsterdam, the Netherlands
Date of Birth	March 27, 1957
Place of Birth	Eindhoven, The Netherlands
Marital Status	Married, two children

Education

1982 M.Sc. ("Doctoraal") in Biology. University of Utrecht
1984 M.D. ("Artsexamen") University of Utrecht
1985 Ph.D. ("Promotie") University of Utrecht

Scientific Training/positions

1985 – 1989	Research Fellow in Pathology. Dana-Farber Cancer Institute, Harvard Medical School, Boston MA, USA
1989 – 1991	Universitair Docent, Department of Clinical Immunology, University of Utrecht
1991 – 2002	Professor and Chairman, Dept. of Immunology, Faculty of Medicine, University of Utrecht
2002 – 2012	Director of the Hubrecht Institute, Developmental Biology and Stem Cell Research
2002 –	Professor in Molecular Genetics, University Medical Center Utrecht
2002 –	Honorary professor at Changsha-Hunan, China
2012-2015	President of the Royal Netherlands Academy of Sciences
2015-	Director Research of the Princess Maxima Center for pediatric oncology

Membership etc

1999 -	Member European Molecular Biology Organisation (EMBO)
2000 -	Member of the Royal Netherlands Academy of Sciences
2004 -	Member of the International Society for Stem Cell Research (ISSCR)
2005 - 2015	Member of the Scientific Advisory Board of ISREC, Swiss Institute for Experimental Cancer Research
2006 -	Member of the American Association for Cancer Research (AACR)

2006-2008	President of the International Society of Differentiation (ISD)
2007 -	Member of the National Scientific Advisory Board NKI-AVL
2008 -	Member of the scientific advisory board of “de Anatomische Les”
2009 -	Member of the Academia Europaea
2010 -	Member of the Scientific Advisory Board of the MRC Clinical Sciences Centre
2012-	Member of the American Academy of Arts and Sciences
2012-	Member of the ‘Koninklijke Hollandsche Maatschappij der Wetenschappen’ (The Royal Holland Society of Sciences and Humanities)
2014-	Foreign Associate of the US National Academy of Sciences
2015-	Member of the the Scientific Advisory Board of the Research Institute of Molecular Pathology (IMP), Vienna
2016-	Foreign Associate of the Academie des sciences de l 'Institut de France
2016-	Member of the Scientific Advisory Board of the Francis Crick Institute

Editorial boards

2004 -	Member of the Editorial Board of the EMBO Journal
2007 -	Member of the of the Editorial Board of Gastroenterology
2009 -	Member of the Editorial Board of Cell
2010 -	Member of the Editorial Board of Genes & Development
2011 -	Member of the Editorial Board of Gastroenterology Report
2012-	Member of the Editorial Board of Stem Cell Reports
2013-	Member of the Editorial Board of Cell Stem Cell
2014-	Member of the Editorial Committee of Annual Review of Cancer Biology

Prizes, awards

2000	Catharijne-prize for medical science
2001	Award from the European Society for Clinical Investigation
2001	Spinoza-award
2004	Louis-Jeantet Prize for Medicine
2005	the Science and Society Prize

2005	the French honor of “Chevalier de la Legion d'Honneur”
2005	Katharine Berkan Judd Award
2006	Rabbi Shai Shacknai Memorial Prize for Immunology and Cancer Research
2008	Josephine Nefkens Prize for Cancer Research (Erasmus MC, Rotterdam)
2008	Meyenburg Cancer Research Award
2009	The Queen Wilhelmina Dutch Cancer Society Award
2010	The United European Gastroenterology Federation (UEGF) Research Prize
2011	The Ernst Jung Medical Award
2011	Kolff prize
2012	Association pour la Recherche sur le Cancer (ARC) Léopold Griffuel Prize
2012	William Beaumont prize of the American Gastroenterology Association
2012	The Heineken Prize for Medicine
2012	Ridder in de Orde van de Nederlandse Leeuw
2013	The Breakthrough Prize in Life Sciences
2014	Massachusetts General Hospital Award in Cancer Research
2014	TEFAF Oncology Chair 2014
2014	Fellow of the AACR Academy
2014	Struyvenberg European Society for Clinical Investigation (ESCI) medal
2014	National Icon of the Netherlands 2014
2015	ISSCR-McEwen Award for Innovation in 2015

Prize juries

2008-2015	Louis Jeantet Prize
2013-2015	Canada Gairdner Award
2014-	Breakthrough Prize
2015	2015 Pezcoller Foundation-AACR International Award for Cancer Research
2015	Dr. Paul Janssen Award
2017	Francqui Prize 2017

Research summary

Lgr5 stem cells, Wnt signaling & cancer

Tcf as Wnt effector
In 1991, we reported the cloning of a T cell specific transcription factor that we termed TCF1 (1). Related genes exist in genomes throughout the animal kingdom.We have shown in frogs (4), flies (7) and worms (11) that the TCF proteins constitute the effectors of the canonical Wnt pathway. Upon Wnt signaling, ß-catenin binds and activates nuclear TCFs by providing a trans-activation domain. For these studies, we designed the widely used pTOPFLASH Wnt reporters. In the absence of Wnt signaling, we found that Tcf factors associate with proteins of the Groucho family of transcriptional repressors to repress target gene transcription (9).

Wnt signaling in cancer
The tumor suppressor protein APC forms the core of a cytoplasmic complex which binds ß-catenin and targets it for degradation in the proteasome. In APC-deficient colon carcinoma cells, we demonstrated that ß-catenin accumulates and is constitutively complexed with the TCF family member TCF4, providing a molecular explanation for the initiation of colon cancer (5).

Wnt signaling in adult stem cells
In mammals, physiological Wnt signaling is intimately involved with the biology of adult stem cells and self-renewing tissues (18,19). We were the first to link Wnt signaling with adult stem cell biology, when we showed that TCF4 gene disruption leads to the abolition of crypts of the small intestine (8), and that TCF1 gene knockout severely disables the stem cell compartment of the thymus (2). The Tcf4-driven target gene program in colorectal cancer cells is the malignant counterpart of a physiological gene program in selfrenewing crypts (13, 14, 21).

Lgr5 as adult stem cell marker
Amongst the Wnt target genes, we found the Lgr5 gene to be unique in that it marks small cycling cells at crypt bottoms. These cells represent the epithelial stem cells of the small intestine and colon (23), the hair follicle (24), the stomach (28) and many other tissue stem cell types.They also represent the cells-of-origin of adenomas in the gut (25) and within adenomas Lgr5 stem cells act as adenoma stem cells (36). Lgr6 marks multipotent skin stem cells (29).

Lgr5 stem cell biology
Lgr5 crypt stem cells behave in unanticipated ways: Against common belief, they divide constantly and in a symmetric fashion. Stem cells numbers remain fixed because stem cells compete 'neutrally' for niche space. Thus, they do not divide asymmetrically (31), a phenomenon that was confirmed by in vivo imaging (43). Daughters of the small intestinal stem cells, the Paneth cells, serve as crypt niche cells by providing Wnt, Notch and EGF signals (30).

The Wnt target gene encoding the transcription factor Achaete scute-like 2 controls the fate of the intestinal stem cell (26).

Lgr5 is the R-spondin receptor
Lgr5 resides in Wnt receptor complexes and mediates signaling of the R-spondin Wnt agonists (32), explaining the unique dependence of Lgr5 stem cells on R-spondins in vivo and in vitro. Two other Wnt target genes, RNF43 and ZNRF3, encode stem cell-specific E3 ligases that downregulate Wnt receptors. They serve in a negative feedback loop to control the size of the stem cell zone (34). Independent work by the Feng Cong lab has first shown that R-spondin, when bound to Lgr5, captures and inactivates RNF43/ZNRF3.

Long-term clonal culturing of organoids from Lgr5 stem cells
Wnt signaling intimately interacts with the BMP and Notch cascades to drive proliferation and inhibit differentiation in intestinal crypts and adenomas (17, 20). Based on these combined insights, we have established Lgr5/R-spondin-based culture systems that allow the outgrowth of single mouse or human Lgr5 stem cells into ever-expanding mini-guts (27), mini-stomachs (28), liver organoids (38, 45), prostate organoids (44) and organoids representing other adult tissues. These epithelial organoid cultures are genetically and phenotypically extremely stable, allowing transplantation of the cultured offspring of a single stem cell, as well as disease modeling by growing organoids directly from diseased patient tissues (45).

As proof-of-concept, the CFTR locus was repaired in single gut stem cells from two Cystic Fibrosis patients, using CRISPR/Cas9 technology in conjunction with homologous recombination. Repaired stem cells were clonally expanded into mini-guts and shown to contain a functional CFTR channel (42).

Key Publications J.C. Clevers

1) van de Wetering, M., Oosterwegel, M., Dooijes, D., and Clevers, H.C. Identification and cloning of TCF-1, a T cell-specific transcription factor containing a sequence-specific HMG box.
EMBO J. 10:123-132 (1991)
2) Verbeek, J.S., Ison, D., Hofhuis, F., Robanus-Maandag, E., te Riele, H., van de Wetering, M., Oosterwegel, M., Wilson, A., MacDonald, H.R. and Clevers, H.C. An HMG box containing T-cell factor required for thymocyte differentiation.
Nature 374: 70-74 (1995)
3) Schilham, M., Oosterwegel, M., Moerer, P., Jing Ya, de Boer, P., van de Wetering, M., Verbeek, S., S., Lamers, W., Kruisbeek, A., Cumano, A., and Clevers, H.Sox-4 gene is required for cardiac outflow tract formation and pro-B lymphocyte expansion.
Nature 380: 711-714 (1996)
4) Molenaar, M., Van de Wetering, M., Oosterwegel, M., Peterson-Maduro, J., Godsave, S., Korinek, V., Roose, J., Destrée, O. And Clevers, H. Xtcf-3 Transcription factor mediates beta-catenin-induced axis formation in xenopus embryos.
Cell 86: 391-399 (1996)
5) Korinek, V, Barker, N., Morin, P.J., van Wichen, D., de Weger, R., Kinzler, K.W., Vogelstein, B., and Clevers, H. Constitutive Transcriptional Activation by a beta-catenin-Tcf complex in APC-/- Colon Carcinoma.
Science 275: 1784-1787 (1997)
6) Morin, P.J., Sparks, A., Korinek, V., Barker, N., Clevers, H., Vogelstein, B., and Kinzler, K. Activation of beta-catenin-Tcf signaling in colon cancer by mutations in beta-catenin or APC.
Science 275: 1787-1790 (1997)
7) van de Wetering, M., Cavallo, R., Dooijes, D., van Beest, M., van Es, J., Loureiro, J., Ypma, A., Hursh, D., Jones, T., Bejsovec, A., Peifer, M., Mortin, M., and Clevers, H. Armadillo co-activates transcription driven by the product of the Drosophila segment polarity gene dTCF.
Cell 88, 789-799 (1997)
8) Korinek, V., Barker, N., Moerer, P., van Donselaar, E., Huls, G., Peters, P.J. and Clevers, H. Depletion of epithelial stem cell compartments in the small intestine of mice lacking Tcf 4.
Nat Genet 19: 379 383 (1998)
9) Roose, J., Molenaar, M., Peterson, J., Hurenkamp, J., Brantjes, H., Moerer, P., van de Wetering, M., Destree, O., and Clevers, H. The Xenopus Wnt effector XTcf-3 interacts with Groucho-related

transcriptional repressors.
Nature 395: 608-612 (1998)

10) Roose, J., Huls, G., van Beest, M., Moerer, P., van der Horn, K., Goldschmeding, R., Logtenberg, T., and Clevers, H. Synergie between tumor suppressor APC and the beta-catenin/Tcf4 target gene Tcf1.
Science 285: 1923-1926 (1999)

11) Korswagen, R., Herman, M. and Clevers, H. Separate beta-catenins mediate Wnt signaling and cadherin adhesion in C. elegans.
Nature 406: 527-532 (2000)

12) Bienz, M., and Clevers, H. Linking colorectal cancer to Wnt signaling. *Review*
Cell 103: 311-320 (2000)

13) van de Wetering, M., Sancho, E., Verweij, C., de Lau, W., Oving, I., Hurlstone, A., van der Horn, K., Batlle, E., Coudreuse, D., Haramis, A-P., Tjon-Pon-Fong, M., Moerer, P., van den Born, M., Soete, G., Pals, S., Eilers, M., Medema, R., Clevers, H. The beta catenin/TCF4 complex imposes a crypt progenitor phenotype on colorectal cancer cells.
Cell 111: 241-250 (2002)

14) Batlle, E., Henderson, J.T., Beghtel, H., van den Born, M., Sancho, E., Huls, G., Meeldijk, J., Robertson, J., van de Wetering, M., Pawson, T., Clevers, H. Beta- catenin and TCF mediate cell positioning in the intestinal epithelium by controlling the expression of EphB/ephrinB.
Cell 111: 251-263 (2002)

15) Hurlstone, A.F., Haramis, A.P., Wienholds, E., Begthel, H., Korving, J., van Eeden, F., Cuppen, E., Zivkovic, D., Plasterk, R.H., Clevers, H. The Wnt/beta-catenin pathway regulates cardiac valve formation.
Nature 425: 633-637 (2003)

16) Baas, A.F., Kuipers, J., van der Wel, N.N., Batlle, E., Koerten, H.K., Peters, P.J., Clevers, H.C. Complete polarization of single intestinal epithelial cells upon activation of LKB1 by STRAD.
Cell 116: 457-466 (2004)

17) Haramis, A.P., Begthel, H., van den Born, M., van Es, J., Jonkheer, S., Offerhaus, G.J., Clevers, H. De novo crypt formation and Juvenile Polyposis upon BMP inhibition.
Science 303: 1684-1686 (2004)

18) Radtke, F and Clevers, H., Self-renewal and cancer of the gut: Two sides of a coin. Review
Science 307: 1904-1909 (2005)

19) Reya, T., Clevers, H., Wnt signalling in stem cells and cancer. Review.
Nature 434: 843-850 (2005)

20) Van Es, J.H., Van Gijn, M.E., Riccio, O., van den Born, M., Vooijs, M., Begthel, H., Cozijnsen, M., Robine, S., Winton, D.J., Radtke, F., Clevers H. Notch pathway/γ-secretase inhibition turns proliferative cells in intestinal crypts and neoplasia into Goblet cells.
Nature 435: 959-963 (2005)

21) Batlle, E., Bacani, J., Begthel, H., Jonkheer, S., Gregorieff, A., van de Born, M., Malats, N., Sancho, E., Boon, E., Pawson, T., Gallinger, S., Pals, S., Clevers, H. EphB activity suppresses colorectal cancer progression.
Nature 435: 1126-1130 (2005)

22) Clevers, H. Wnt/β-catenin signaling in development and disease, Review
Cell 127: 469-480 (2006)

23) Barker, N., Van Es, J.H., Kuipers, J., Kujala, P., Van den Born, M., Cozijnsen, M., Haegebarth, A., Korving, J., Begthel, H., Peters, P.J., Clevers, H. Identification of stem cells in small intestine

and colon by the marker gene LGR5.
Nature 449: 1003-1007 (2007)

24) Jaks, V., Barker, N, Kasper, M., van Es, J.H., Snippert, H.J., Clevers, H., Toftgård, R. Lgr5 marks cycling, yet long-lived, hair follicle stem cells.
Nat Genet. 40: 1291-1299 (2008)

25) Barker, N., Ridgway, R.A., van Es, J.H.,van de Wetering, M., Begthel, H., van den Born, M., Danenberg, E., Clarke, A.R., Sansom, O.J., Clevers, H. Crypt Stem Cells as the Cells-of-Origin of Intestinal Cancer.
Nature 457: 608-611 (2009)

26) van der Flier, L.G., van Gijn, M.E., Hatzis, P., Kujala, P., Haegebarth, A., Stange, D.E., Begthel, H., van den Born, M., Guryev, V., Oving, I., van Es, J.H., Barker, N., Peters, P.J., van de Wetering, M. and Clevers, H. Transcription Factor Achaete Scute-Like 2 Controls Intestinal Stem Cell Fate.
Cell 136: 903-912 (2009)

27) Sato, T., Vries, R., Snippert, H., van de Wetering, M., Barker, N., Stange, D., van Es, J., Abo, A., Kujala, P., Peters, P., and Clevers, H. Single lgr5 gut stem cells build crypt-villus structures in vitro without a stromal niche.
Nature 459 :262-265 (2009)

28) Barker, N., Huch, M., Kujala, P., van de Wetering, M., Snippert, H.J., van Es, J.H., Sato, T., Stange, D.E., Begthel, H., van den Born, M., Danenberg, E., van den Brink, S., Korving, J., Abo, A., Peters, P.J., Wright, N., Poulsom, R., Clevers, H. Lgr5(+ve) stem cells drive self-renewal in the stomach and build long-lived gastric units *in vitro*.
Cell Stem Cell 6: 25-36 (2010)

29) Snippert, H.J., Haegebarth, A., Kasper, M., Jaks, V., van Es, J.H., Barker, N., van de Wetering, M., van den Born, M., Begthel, H., Vries, R.G., Stange, D.E., Toftgård, R., Clevers H. Lgr6 marks stem cells in the hair follicle that generate all cell lineages of the skin.
Science 327: 1385-1389 (2010)

30) Sato, T., van Es, J.H., Snippert, H.J., Stange, D.E., Vries, R.G., van den Born, M., Barker, N., Shroyer, N.F., van de Wetering, M., Clevers, H. Paneth cells constitute the niche for Lgr5 stem cells in intestinal crypts.
Nature 469: 415-418 (2011)

31) Snippert, J., van der Flier, L.G., Sato, T., van Es, J.H., van den Born, M., Kroon-Veenboer, C., Barker, N.,Klein, A.M., van Rheenen, J. Benjamin D. Simons, B.D. and Clevers, H. Intestinal Crypt Homeostasis results from Neutral Competition between Symmetrically Dividing Lgr5 Stem Cells.
Cell 143:134-44 (2010)

32) de Lau, W., Barker, N., Low, T.Y., Koo, B.K., Li, V.S., Teunissen, H., Kujala, P., Haegebarth, A., Peters, P.J., van de Wetering, M., Stange, D.E., van Es, J., Guardavaccaro, D., Schasfoort, R.B., Mohri, Y., Nishimori, K., Mohammed,S., Heck, A.J., Clevers, H. Lgr5 homologues associate with Wnt receptors and mediate R-spondin signalling.
Nature 476: 293-297 (2011)

33) Li, V.S., Ng, S.S., Boersema, P.J., Low, T.Y., Karthaus, W.R., Gerlach, J.P., Mohammed, S., Heck, A.J., Maurice, M.M., Mahmoudi, T. and Clevers H. Wnt signaling inhibits proteasomal β-catenin degradation within a compositionally intact Axin1 complex.
Cell 149: 1245-1256 (2012)

34) Koo, B-K., Spit, M. Jordens, I., Low, T.Y., Stange, D.E., van de Wetering, M., van Es, J.H., Mohammed, S., Heck, A.J.R., Maurice, M.M. and Hans Clevers. Tumour suppressor RNF43 is a stem cell E3 ligase that induces endocytosis of Wnt receptors.
Nature 488: 665-669 (2012)

35) Schepers, A.G., Snippert, H.J., Stange, D.E., van den Born, M., van Es, J.H., van de Wetering, M., Clevers, H. Lineage Tracing Reveals Lgr5+ Stem Cell Activity in Mouse Intestinal Adenomas. **Science** 337: 730-735 (2012)

36) van Es, J.H., Sato, T., van de Wetering, M., Lyubimova, A., Yee Nee, A.N., Gregorieff, A., Sasaki, N., Zeinstra, L., van den Born, M., Korving, J., Martens, A.C., Barker, N., van Oudenaarden, A., Clevers, H. Dll1(+) secretory progenitor cells revert to stem cells upon crypt damage. **Nat Cell Biol**. 14: 1099-1104 (2012)

37) Boj, S,F., van Es, J.H.,Huch. M., Li, V.S., Jose, A., Hatzis, P., Mokry, M., Haegebarth, A., van den Born, M., Chambon, P., Voshol, P., Dor, Y., Cuppenm E., Fillat, C., Clevers, H. Diabetes risk gene and Wnt effector Tcf7l2/TCF4 controls hepatic response to perinatal and adult metabolic demand. **Cell** 151: 1595-1607 (2012)

38) Huch, M., Dorrell, C., Boj, S.F., van Es, J.H., van de Wetering, M., Li, V.S.W., Hamer, K., Sasaki, N., Finegold, M.J., Haft, A., Grompe, M., Clevers, H. In vitro expansion of single Lgr5+ liver stem cells induced by Wnt-driven regeneration. **Nature** 494: 247-250 (2013)

39) Sato, T., Clevers, H.. Growing self-organizing mini-guts from a single intestinal stem cell: mechanism and applications. Review **Science** 340: 1190-1194 (2013)

40) Clevers, H. The intestinal crypt, a prototype stem cell compartment. **Cell**. 154: 274-284 (2013)

41) Stange, D.E., Koo, B.K., Huch, M., Sibbel, G., Basak, O., Lyubimova, A., Kujalla, P., Bartfeld, S., Koster, J., Geahlen, J.H., Peters, P.J., van Es, J., van de Wetering, M., Mills, J.C., Clevers, H. Differentiated Troy+ chief cells act as 'reserve' stem cells to generate all lineages of the stomach epithelium. **Cell** 155: 357-368 (2013)

42) Schwank, G., Koo, B.K., Sasselli, V., Dekkers, J.F., Heo, I., Demircan, T., Sasaki, N., Boymans, S., Cuppen, E., van der Ent, C.K., Nieuwenhuis, E.E., Beekman, J.M., Clevers, H. Functional Repair of CFTR by CRISPR/Cas9 in Intestinal Stem Cell Organoids of Cystic Fibrosis Patients. **Cell Stem Cell** 13: 653-658 (2013)

43) Ritsma, L., Ellenbroek, S.I., Zomer, A., Snippert, H.J., de Sauvage, F.J., Simons, B.D., Clevers, H., van Rheenen, J. Intestinal crypt homeostasis revealed at single-stem-cell level by in vivo live imaging. **Nature** 507: 362-365 (2014)

44) Karthaus, W.R., Iaquinta, P.J., Drost, J., Gracanin, A., van Boxtel, R., Wongvipat, J., Dowling, C.M., Gao, D., Begthel, H., Sachs, N., Vries, R.G., Cuppen, E., Chen, Y., Sawyers, C.L., Clevers, H.C. Identification of Multipotent Luminal Progenitor Cells in Human Prostate Organoid Cultures. **Cell.** 159:163-175 (2014)

45) Huch, M., Gehart, H., van Boxtel, R., Hamer, K., Blokzijl, F., Verstegen, M., Ellis, E., van Wenum, M., Fuchs, S., de Ligt, J., van de Wetering, M., Sasaki, N., Boers, S., Kemperman, H., de Jonge, J. IJzermans, J., Niewenhuis, E., Hoekstra, R., Strom, S., Vries, R., van der Laan, L., Cuppen, E., Clevers, H. Long-term culture of genome-stable bipotent stem cells from adult human liver. **Cell** 160: 299-312 (2015)

46) Boj, S.F., Hwang, C.I., Baker, L.A., Chio, I.I., Engle, D.D., Corbo, V., Jager, M., Ponz-Sarvise, M., Tiriac, H., Spector, M.S., Gracanin, A., Oni, T., Yu, K.H., van Boxtel, R., Huch, M., Rivera, K.D., Wilson, J.P., Feigin, M.E., Öhlund, D., Handly-Santana, A., Ardito-Abraham, C.M., Ludwig, M., Elyada, E., Alagesan, B., Biffi, G., Yordanov, G.N., Delcuze, B., Creighton, B., Wright, K., Park, Y., Morsink, F.H., Molenaar, I.Q., Borel Rinkes, I.H., Cuppen, E., Hao, Y., Jin, Y., Nijman, I.J., Iacobuzio-Donahue, C., Leach, S.D., Pappin, D.J., Hammell, M., Klimstra, D.S., Basturk, O., Hruban RH, Offerhaus GJ, Vries RG, Clevers H, Tuveson DA. Organoid models of human and mouse ductal pancreatic cancer. **Cell** 160: 324-338 (2015)

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

48) Drost, J., van Jaarsveld, R.H., Ponsioen, B., Zimberlin, C., van Boxtel, R., Buijs, A.,Sachs, N., Overmeer, R.M., Offerhaus, G.J., Begthel, H. Korving, J., van de Wetering, M., Schwank, G. Logtenberg, M., Cuppen, E., Snippert, H.J., Medema, J.P., Kops, G. J. P. L., Clevers, H. Sequential cancer mutations in cultured human intestinal stem cells.
Nature 521: 43-47 (2015)

49) Farin, H.F., Jordens, I., Mosa, M.H., Basak, O., Korving, J., Tauriello, D.V.F., de Punder, K., Angers, S., Peters, P.J. Maurice, M.M. and Clevers, H. Visualization of the short-range Wnt gradient in the intestinal stem cell niche.
Nature *(in press)*