Michael Chang
Group leader
European Research Institute on the Biology of Ageing (ERIBA)
University Medical Centre Groningen (UMCG)
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Professional experience
2012 – present
Group leader, European Research Institute for the Biology of Ageing (ERIBA), University Medical Center Groningen, University of Groningen, Groningen, the Netherlands

2008 – 2011
Postdoctoral fellow, Dept. of Genetics & Development, Columbia University, New York, USA
(Supervisor: Dr. Rodney J. Rothstein)

2006 – 2008
Postdoctoral fellow, Swiss Institute for Experimental Cancer Research (ISREC), Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne, Switzerland
(Supervisor: Dr. Joachim Lingner)

Education
2000 – 2005
Ph.D., Department of Biochemistry, University of Toronto, Canada (Supervisor: Dr. Grant W. Brown; Thesis: Identification of novel DNA damage response genes using functional genomics)

1996 – 2000
Hon. B.Sc., Faculty of Arts and Science, University of Toronto, Canada
Specialist program: Molecular Genetics & Molecular Biology
Major program: Human biology
Minor program: Zoology
4th year project supervisor: Dr. Brenda J. Andrews

Grants and awards
2019 IMB-ERIBA Collaborative Grant (co-applicant)
2014 ERIBA-UMCG Collaborative Grant (co-applicant; EUR 50,000)
2013 Netherlands Organisation for Scientific Research (NWO) Vidi Grant (EUR 860,000) 2010 Terry Fox Foundation Fellowship (CAD 96,416)
2007 Human Frontier Science Program Long-Term Fellowship (CHF 132,850 + USD 76,807) 2006 EMBO Long-Term Fellowship (CHF 56,382)
2005 Canadian Institutes of Health Research Short-Term Research Grant
2004 Ontario Graduate Scholarship (CAD 15,000)
2004 National Cancer Institute of Canada Student Travel Award
2004 Dorothy Sterling Dow Walsh Award
2003 Ontario Graduate Scholarship (CAD 15,000)
2002 University of Toronto Open Fellowship (CAD 12,000)
2001 University of Toronto Open Fellowship (CAD 12,000)
2000 Summer Undergraduate Research Fellowship

Research output
Detecting the metabolism of individual yeast mutant strain cells when aged, stressed or treated with antioxidants with diamond magnetometry
Morita, A., Nusantara, A. C., Myzk, A., Perona Martinez, F. P., Hamoh, T., Damle, V. G., Laan, K. J. V. D., Sigaeva, A., Vedelaar, T., Chang, M., Chipaux, M. & Schirhagl, R., Feb-2023, In: Nano Today. 48, 13 p., 101704.
Investigating the role of G-quadruplexes at *Saccharomyces cerevisiae* telomeres
Stinus Ruiz de Gauna, S., Rosas Bringas, F., Wanders, L. & Chang, M., 6-Jun-2022, In: Microbial Cell. 9, 6, p. 126 - 132
7 p.

High-throughput replica-pinning approach to screen for yeast genes controlling low-frequency events
Novarina, D., Bringas, F. R. R., Rosas Bringas, O. & Chang, M., 18-Mar-2022, In: STAR protocols. 3, 1, 17 p., 101082.

Rif2 protects Rap1-depleted telomeres from MRX-mediated degradation in *Saccharomyces cerevisiae*
Rosas Bringas, F., Stinus Ruiz de Gauna, S., Zoeten, de, P., Cohn, M. & Chang, M., 19-Jan-2022, In: eLife. 21 p.

Suppression of cdc13-2-associated senescence by pif1-m2 requires Ku-mediated telomerase recruitment
Fekete-Szücs, E., Rosas Bringas, F., Stinus, S. & Chang, M., 4-Jan-2022, In: G3 Genes|Genomes|Genetics. 12, 1, 8 p.

A synthetic lethal screen identifies HDAC4 as a potential target in MELK overexpressing cancers
Zhou, L., Zheng, S., Rosas Bringas, F. R., Bakker, B., Simon, J. E., Bakker, P. L., Kazemier, H. G., Schubert, M., Roorda, M., van Vugt, M. A. T. M., Chang, M. & Fojer, F., Dec-2021, In: G3 : Genes, Genomes, Genetics. 11, 12, 10 p., 335.

Suppression of cdc13-2-associated senescence by pif1-m2 requires Ku-mediated telomerase recruitment
Fekete-Szücs, E., Rosas Bringas, F., Stinus, S. & Chang, M., 31-Mar-2021, (Accepted/In press) In: bioRxiv.

Quantum monitoring the metabolism of individual yeast mutant strain cells when aged, stressed or treated with antioxidant
Morita, A., Nusantara, C., Perona Martinez, F., Hamoh, T., Damle, V., Laan, van der, K., Sigaeva, A., Vedelaar, T., Chang, M., Chipaux, M. & Schirhagl, R., 31-Jul-2020, (Submitted) In: ArXiv. 36 p.

A Genome-Wide Screen for Genes Affecting Spontaneous Direct-Repeat Recombination in *Saccharomyces cerevisiae*
Novarina, D., Desai, R., Vaisica, J. A., Ou, J., Bellaoui, M., Brown, G. W. & Chang, M., Jun-2020, In: G3 : Genes, Genomes, Genetics. 10, 6, p. 1858-1867 50 p.

A genome-wide screen identifies genes that suppress the accumulation of spontaneous mutations in young and aged yeast cells
Novarina, D., Janssens, G. E., Bokern, K., Schut, T., van Oerle, N. C., Kazemier, H. G., Veenhoff, L. M. & Chang, M., 1- Feb-2020, In: Aging Cell. 19, 2, 13 p., e13084.

Upregulation of dNTP Levels After Telomerase Inactivation Influences Telomerase-Independent Telomere Maintenance Pathway Choice in *Saccharomyces cerevisiae*
van Mourik, P. M., de Jong, J., Sharma, S., Kavšek, A., Chabes, A. & Chang, M., Aug-2018, In: G3 : Genes, Genomes, Genetics. 8, 8, p. 2551-2558 8 p.

Telomerase regulation by the Pif1 helicase: a length-dependent effect?
Stinus, S., Paeschke, K. & Chang, M., Apr-2018, In: Current Genetics. 64, 2, p. 509-513 5 p.

Guidelines and recommendations on yeast cell death nomenclature
Carmona-Gutierrez, D., Bauer, M. A., Zimmermann, A., Aguilera, A., Austriaco, N., Ayscough, K., Balzan, R., Bar-Nun, S., Barrientos, A., Belenky, P., Blondel, M., Braun, R. J., Breitenbach, M., Burhans, W. C., Büttner, S., Cavalieri, D., Chang, M., Cooper, K. F., Côrte-Real, M., Costa, V., & 67 othersCullin, C., Dawes, I., Dengiel, J., Dickman, M. B., Eisenberg, T., Fahrenkrog, B., Fasel, N., Fröhlich, K-U., Gargouri, A., Giannattasio, S., Goffrini, P., Gourlay, C. W., Grant, C. M., Greenwood, M. T., Guaragnella, N., Heger, T., Heinisch, J., Herker, E., Herrmann, J. M., Hofer, S., Jiménez-Ruiz, A., Jungwirth, H., Kainz, K., Kontoyiannis, D. P., Ludovico, P., Manor, S., Martegani, E., Mazzoni, C., Megeney, L. A., Meisinger, C., Nielsen, J., Nyström, T., Osiewacz, H. D., Outeiro, T. F., Park, H-O., Pendl, T., Petranovic, D., Picot, S., Polić, P., Powers, T., Ramsdale, M., Rinnerthaler, M., Rockenfeller, P., Ruckenstein, C., Schaffrath, R., Segovia, M., Severin, F. F., Sharon, A., Sigrist, S. J., Sommer-Ruck, C., Sousa, M. J., Thevelein, J. M., Thevissen, K., Tito Lenko, V., Toledano, M. B., Tuile, M., Vögtle, F-N., Westermann, B., Winderickx, J., Wissing, S., Wolff, S., Zhang, Z. J., Zhao, R. Y., Zhou, B., Galluzzi, L., Kroemer, G. & Madeo, F., 1-Jan-2018, In: Microbial Cell. 5, 1, p. 4-31 28 p.
Genome-wide mapping of sister chromatid exchange events in single yeast cells using Strand-seq
Claussin, C., Porubsky, D., Spierings, D. C. J., Halsema, N., Rentas, S., Guryev, V., Lansdorp, P. M. & Chang, M., 12-Dec-2017, In: eLife. 6, 17 p., 30560.

A sharp Pif1-dependent threshold separates DNA double-strand breaks from critically short telomeres
Strecker, J., Stinus, S., Caballero, M. P., Szilard, R. K., Chang, M. & Durocher, D., 3-Aug-2017, In: eLife. 6, 59 p., e23783.

Generally Applicable Transformation Protocols for Fluorescent Nanodiamond Internalization into Cells
Hemelaar, S. R., van der Laan, K. J., Hinterding, S. R., Koot, M. V., Ellermann, E., Perona-Martinez, F. P., Roig, D., Hommelet, S., Novarina, D., Takahashi, H., Chang, M. & Schirhagl, R., 19-Jul-2017, In: Scientific Reports. 7, 7 p., 5862.

Double-strand breaks are not the main cause of spontaneous sister chromatid exchange in wild-type yeast cells
Claussin, C., Porubsky, D., Spierings, D. C. J., Halsema, N., Rentas, S., Guryev, V., Lansdorp, P. M. & Chang, M., 17-Jul-2017, (E-pub ahead of print) In: bioRxiv. 36 p.

Increased genome instability is not accompanied by sensitivity to DNA damaging agents in aged yeast cells
Novarina, D., Mavrova, S. N., Janssens, G. E., Rempel, I. L., Veenhoff, L. M. & Chang, M., Jun-2017, In: Dna repair. 54, p. 1-7 7 p.

A simple microfluidic platform to study age-dependent protein abundance and localization changes in Saccharomyces cerevisiae
Cabrera, M., Novarina, D., Rempel, I. L., Veenhoff, L. M. & Chang, M., 13-Apr-2017, In: Microbial Cell. 4, 5, p. 169-174 6 p.

Multiple Rad52-Mediated Homology-Directed Repair Mechanisms Are Required to Prevent Telomere Attrition-Induced Senescence in Saccharomyces cerevisiae
Claussin, C. & Chang, M., Jul-2016, In: PLoS genetics. 12, 7, 19 p., 1006176.

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Mourik, van, P. M., de Jong, J., Agpalo, D., Claussin, C., Rothstein, R. & Chang, M., 14-Mar-2016, In: PLoS ONE. 11, 3, 9 p., e0151314.

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Telomere length homeostasis responds to changes in intracellular dNTP pools
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Rif2 Promotes a Telomere Fold-Back Structure through Rpd3L Recruitment in Budding Yeast
Poschke, H., Dees, M., Chang, M., Amberkar, S., Kaderali, L., Rothstein, R. & Luke, B., Sep-2012, In: PLoS genetics. 8, 9 , 13 p., e1002960.

Long telomeres: Too much of a good thing
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Chang, M. & Rothstein, R., 1-Nov-2011, In: Cell Cycle. 10, 21, p. 3798-92 p.

Long telomeres are preferentially extended during recombination-mediated telomere maintenance
Chang, M., Dittmar, J. C. & Rothstein, R., Apr-2011, In: Nature Structural & Molecular Biology. 18, 4, p. 451-456 6 p.
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Chang, M., Luke, B., Kraft, C., Li, Z., Peter, M., Lingner, J. & Rothstein, R., Nov-2009, In: Genetics. 183, 3, p. 779-791 13 p.

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Chang, M. & Lingner, J., 4-Apr-2008, In: Science. 320, 5872, p. 60-61 2 p.

Telomerase repeat addition processivity is increased at critically short telomeres in a Tel1-dependent manner in Saccharomyces cerevisiae
Chang, M., Arneric, M. & Lingner, J., 1-Oct-2007, In: Genes & Development. 21, 19, p. 2485-2494 10 p.

BLAP75/RMI1 promotes the BLM-dependent dissolution of homologous recombination intermediates
Wu, L., Bachrati, C. Z., Ou, J., Xu, C., Yin, JH., Chang, M., Wang, W., Li, L., Brown, GW. & Hickson, ID., 14-Mar-2006, In: Proceedings of the National Academy of Sciences of the United States of America. 103, 11, p. 4068-4073 6 p.

Genomic approaches for identifying DNA damage response pathways in S.cerevisiae
Chang, M., Parsons, A. B., Sheikh, B. H., Boone, C. & Brown, G. W., 2006, Methods in Enzymology. Campbell, JL. & Modrich, P. (eds.). Academic Press, Vol. 409. p. 213-235 23 p. (Methods in Enzymology; vol. 409).

RMI1/NCE4, a suppressor of genome instability, encodes a member of the RecQ helicase/Topo III complex
Chang, M., Bellaoui, M., Zhang, CY., Desai, R., Morozov, P., Delgado-Cruzata, L., Rothstein, R., Freyer, GA., Boone, C. & Brown, GW., 1-Jun-2005, In: EMBO Journal. 24, 11, p. 2024-2033 10 p.

The origin recognition complex links replication, sister chromatid cohesion and transcriptional silencing in Saccharomyces cerevisiae
Suter, B., Tong, A., Chang, M., Yu, L., Brown, G. W., Boone, C. & Rine, J., Jun-2004, In: Genetics. 167, 2, p. 579-591 13 p.

Identification of protein complexes required for efficient sister chromatid cohesion
Mayer, ML., Pot, A., Chang, M., Xu, H., Aneliunas, V., Kwok, T., Newitt, R., Aebersold, R., Boone, C., Brown, GW. & Hieter, P., Apr-2004, In: Molecular Biology of the Cell. 15, 4, p. 1736-1745 10 p.

Global mapping of the yeast genetic interaction network
Tong, AHY., Lesage, G., Bader, GD., Ding, HM., Xu, H., Xin, XF., Young, J., Berriz, GF., Brost, RL., Chang, M., Chen, YQ., Cheng, Y., Chua, G., Friesen, H., Goldberg, DS., Haynes, J., Humphries, C., He, G., Hussein, S., Ke, LZ., & 30 othersKrogan, N., Li, ZJ., Levinson, JN., Lu, H., Menard, P., Munyana, C., Parsons, AB., Ryan, O., Tonikian, R., Roberts, T., Sdicu, AM., Shapiro, J., Sheikh, B., Suter, B., Wong, SL., Zhang, LV., Zhu, HW., Burd, CG., Munro, S., Sander, C., Rine, J., Greenblatt, J., Peter, M., Bretscher, A., Bell, G., Roth, FP., Brown, GW., Andrews, B., Bussey, H. & Boone, C., 6-Feb-2004, In: Science. 303, 5659, p. 808-813 6 p.

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Bellaoui, M., Chang, M., Ou, J., Xu, H., Boone, C. & Brown, G. W., 15-Aug-2003, In: EMBO Journal. 22, 16, p. 4304-4313 10 p.

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Chang, M., Bellaoui, M., Boone, C. & Brown, GW., 24-Dec-2002, In: Proceedings of the National Academy of Sciences of the United States of America. 99, 26, p. 16934-16939 6 p.

Transcriptional coregulation by the cell integrity mitogen-activated protein kinase Slt2 and the cell cycle regulator Swi4
Baetz, K., Moffat, J., Haynes, J., Chang, M. & Andrews, B., Oct-2001, In: Molecular and Cellular Biology. 21, 19, p. 6515-28 14 p.