

Yuanfang Guan
Assistant Professor
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Education and Training

Education

09/2002-06/2005 BS, Biology, University of Hong Kong, Hong Kong, Hong Kong
09/2005-05/2010 PhD, Molecular Biology, Princeton University, Princeton, NJ

PostDoctoral Training

06/2010-09/2011 Postdoctoral Fellow, Integrative Genomics, Princeton University, Princeton, NJ

Academic, Administrative, Clinical and Military Appointments

Academic Appointments

10/2011-09/2012 Research Investigator, University of Michigan, Ann Arbor, MI
10/2012-present Assistant Professor, University of Michigan, Ann Arbor, MI

Research Interests

- Integrative Genomics

Grants

Current Grants

Michigan Alzheimer's Disease Core Center NIH
Co-I (Principal Investigator: Paulson)
09/2016-08/2021

Cross-disease brain image modeling Alzheimer's Association
Yuanfang Guan, PI
11/2015-03/2018

Mechanisms of Polyglutamine Neurodegeneration NIH
Co-I (Principal Investigator: Paulson)
07/2015-06/2020

CAREER: On-line Service for Predicting Protein Phosphorylation Dynamics Under Unseen Perturbations NSF
Yuanfang Guan, PI
04/2015-09/2020

University of Michigan O'Brien Kidney Translational Core Center NIH
Co-I (Principal Investigator: Pennathur)
11/2013-10/2018

European Consortium for High-Throughput Research in Rare Kidney Diseases University of Heidelberg
Co-I (Principal Investigator: Kretzler)
06/2012-05/2017

Past Grants

Integrating context-specific networks to predict ataxia genes NIH
Yuanfang Guan, Margit Burmeister, PI
03/2013-06/2015

Honors and Awards

International

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| 2013 | First place in DREAM Breast Cancer Network Inference - sub-challenge 2 |
| 2014 | First place in DREAM Alzheimer BigData Challenge #1 |
| 2014 | First place in DREAM Broad Institute Gene Essentiality Challenge - sub-challenge 2 |
| 2014 | First place in DREAM Rheumatoid Arthritis Challenge |
| 2015 | First place in DREAM ALS Stratification Prize4Life Challenge |
| 2015 | First place in DREAM Olfaction Challenge |
| 2015 | First place in DREAM Prostate Cancer Challenge - sub-challenge 2 |
| 2016 | First place in DREAM AstraZeneca Drug Combination Prediction Challenge |
| 2016 | First place in ICGC-TCGA-DREAM Somatic Mutation Calling Challenge -- Tumor Heterogeneity and Evolution |
| 2017 | First place in DREAM ENCODE Transcription Factor Binding Site Prediction Challenge |

National

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| 2015 | NSF CAREER AWARD |
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Institutional

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| 2001 | First Prize Scholarship (for ranking number 2 in China National College Entrance Exam) |
| 2002-2005 | Hong Kong Jockey Club scholarship (full fellowship for 3-year undergraduate study in HKU) |
| 2004 | BSc Class of 1971 Prize (the best student in Physical Sciences, among those completing BSc 2nd year in HKU) |
| 2004 | Dr. Sprint Chen Memorial Prizes in Botany (for ranking 1st in GPA among 2nd year of BS major or minor in Biological Sciences in HKU) |
| 2004 | Li Po Kwai Scholarships (for ranking 1st in GPA in 2nd year of BS in HKU who major or minor in physics) |
| 2005 | Dean's Honours List |
| 2005 | Lee Chung Yin Jubilee Prize in Zoology (for ranking first in GPA among BS 3rd year students major or minor in biological science in HKU) |
| 2005 | Li Po Kwai Scholarships (for ranking 1st in GPA in 3rd year of BS in HKU who major or minor in physics.) |

Editorial Positions, Boards, and Peer-Review Service

Study Sections

International

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|--------------|------------------------------------------------------------------------------|
| 2015-present | Natural Sciences and Engineering Research Council of Canada (NSERC) (Ad Hoc) |
| 2017-present | Alzheimer's Foundation (Ad Hoc) |

Journal Reviewer

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| 2010-present | Bioinformatics (Ad Hoc) |
| 2012-2013 | PSB (Ad Hoc) |
| 2012-present | PLoS One (Ad Hoc) |
| 2013-present | BMC systems biology (Ad Hoc) |
| 2013-present | Bioanalysis (Ad Hoc) |
| 2013-present | PLoS Computational Biology (Ad Hoc) |
| 2013 | BMC Bioinformatics (Ad Hoc) |
| 2014-present | BMC Genomics (Ad Hoc) |
| 2014-present | Molecular and Cellular Biology (Ad Hoc) |

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| 2014-present | Proteomics (Ad Hoc) |
| 2015-present | Computers in Biology and Medicine (Ad Hoc) |
| 2016-present | Cell (Ad Hoc) |
| 2017-present | BioData Mining (Ad Hoc) |

Teaching

Graduate Student

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|-----------------|------------------------------------------------|
| 09/2012-present | Ridvan Eksi, Ph.D., University of Michigan |
| 09/2015-04/2017 | Zhengnan Huang, Master, University of Michigan |
| 09/2015-present | Hongjiu Zhang, Ph.D., University of Michigan |
| 09/2016-present | Marlena Duda, Ph.D., University of Michigan |
| 01/2017-present | Tingyang Li, Ph.D., University of Michigan |
| 03/2017-present | Hongyang Li, Ph.D., University of Michigan |

Postdoctoral Fellow

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| 09/2012-06/2015 | Hongdong Li, Postdoc, University of Michigan |
| 03/2013-06/2015 | Fan Zhu, Postdoc, University of Michigan |

Undergraduate Student

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| 09/2012-09/2013 | Benjamin Toll, B.S., University of Michigan |
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Teaching Activity

Institutional

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| 09/2014-present | BIOINFO603 Journal Club |
| 09/2015-present | BIOINFO585 Machine Learning |

Dissertation Committees

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| 2015 | Avinash Kumar Shanmugam, Proteomics, University of Michigan, DCMB, Committee Member |
| 2017 | Andy Kong, Computational strategies for proteogenomics analyses, University of Michigan, DCMB, Committee Member |
| Present | Chengxin Zhang, Protein structure prediction, University of Michigan, DCMB, Committee Member |
| Present | Hongjiu Zhang, Cancer genomics, University of Michigan, DCMB, Chair |
| Present | Ridvan Eksi, Novel isoform discovery in nephrotic syndrome, University of Michigan, DCMB, Chair |
| Present | Shengcheng Dong, Regulatory Genomics, University of Michigan, DCMB, Committee Member |

Visiting Professorships and Extramural Invited Presentations

Other

1. Predicting isoform function through multiple instance learning, ISMB, July 2014, Boston, MA
2. A strategy to select most informative biomarkers for cancer cell lines, RECOMB RegSysGen, November 2014, San Diego, CA
3. Predicting discontinuation due to adverse effect in mCRPC, RECOMB RegSysGen, November 2015, Philadelphia, PA
4. Predicting ALS survival through complete ranking of censored data, RECOMB RegSysGen, November 2015, Philadelphia, PA
5. Predicting olfaction response for each individual, RECOMB RegSysGen, November 2015, Philadelphia, PA

Bibliography

Peer-Reviewed Journals and Publications

1. Guan Y, Dunham MJ, Troyanskaya OG: Functional analysis of gene duplications in *Saccharomyces cerevisiae* Genetics 175(2): 933-943, 2006. PM17151249
2. Lui WY, Wong EW, Guan Y, Lee WM: Dual transcriptional control of claudin-11 via an overlapping GATA/NF-Y motif: Positive regulation through the interaction of GATA, NF-YA, and CREB and negative regulation through the interaction of Smad, HDAC1, and mSin3A J. Cell. Physiol. 211(3): 638-648, 2007. PM17226765
3. Guan Y, Myers CL, Lu R, Lemischka IR, Bult CJ, Troyanskaya OG: A genomewide functional network for the laboratory mouse PLoS Comput. Biol. 4(9): 2008. PM18818725
4. Peña-Castillo L, Tasan M, Myers CL, Lee H, Joshi T, Zhang C, Guan Y, Leone M, Pagnani A, Kim WK, Krumpelman C, Tian W, Obozinski G, Qi Y, Mostafavi S, Lin GN, Berriz GF, Gibbons FD, Lanckriet G, Qiu J, Grant C, Barutcuoglu Z, Hill DP, Warde-Farley D, Grouios C, Ray D, Blake JA, Deng M, Jordan MI, Noble WS, Morris Q, Klein-Seetharaman J, Bar-Joseph Z, Chen T, Sun F, Troyanskaya OG, Marcotte EM, Xu D, Hughes TR, Roth FP: A critical assessment of *Mus musculus* gene function prediction using integrated genomic evidence Genome Biol. 9(SUPPL. 1): 2008. PM18613946
5. Guan Y, Myers CL, Hess DC, Barutcuoglu Z, Caudy AA, Troyanskaya OG: Predicting gene function in a hierarchical context with an ensemble of classifiers Genome Biol. 9(SUPPL. 1): 2008. PM18613947
6. Guan Y, Ramalingam S, Nagegowda D, Taylor PW, Chye ML: *Brassica juncea* chitinase BjCHI1 inhibits growth of fungal phytopathogens and agglutinates Gram-negative bacteria J. Exp. Bot. 59(12): 3475-3484, 2008. PM18669819
7. Guan Y, Chye ML: A *Brassica juncea* chitinase with two-chitin binding domains show anti-microbial properties against phytopathogens and Gram-negative bacteria Plant Signal Behav 3(12): 1103-1105, 2008. PM19704507
8. Guan Y, Ackert-Bicknell CL, Kell B, Troyanskaya OG, Hibbs MA: Functional genomics complements quantitative genetics in identifying disease-gene associations PLoS Comput. Biol. 6(11): 2010. PM21085640
9. Guan Y, Dunham M, Caudy A, Troyanskaya O: Systematic planning of genome-scale experiments in poorly studied species PLoS Comput. Biol. 6(3): 2010. PM20221257
10. Guan Y, Yao V, Tsui K, Gebbia M, Dunham MJ, Nislow C, Troyanskaya OG: Nucleosome-coupled expression differences in closely-related species BMC Genomics 12: 2011. PM21942931
11. Guan Y, Gorensteijn D, Burmeister M, Wong AK, Schimenti JC, Handel MA, Bult CJ, Hibbs MA, Troyanskaya OG: Tissue-Specific Functional Networks for Prioritizing Phenotype and Disease Genes PLoS Comput. Biol. 8(9): 2012. PM23028291
12. Wong AK, Park CY, Greene CS, Bongo LA, Guan Y, Troyanskaya OG: IMP: A multi-species functional genomics portal for integration, visualization and prediction of protein functions and networks Nucleic Acids Res. 40(W1): W484-W490, 2012. PM22684505
13. Yang ZK, Niu YF, Ma YH, Xue J, Zhang MH, Yang WD, Liu JS, Lu SH, Guan Y, Li HY: Molecular and cellular mechanisms of neutral lipid accumulation in diatom following nitrogen deprivation Biotechnol Biofuels 6(1): 2013. PM23642220
14. Park CY, Wong AK, Greene CS, Rowland J, Guan Y, Bongo LA, Burdine RD, Troyanskaya OG: Functional Knowledge Transfer for High-accuracy Prediction of Under-studied Biological Processes PLoS Comput. Biol. 9(3): 2013. PM23516347
15. Guan Y, Dunham MJ, Troyanskaya OG, Caudy AA: Comparative gene expression between two yeast species BMC Genomics 14(1): 2013. PM23324262
16. Caudy AA, Guan Y, Jia Y, Hansen C, DeSevo C, Hayes AP, Agee J, Alvarez-Dominguez JR, Arellano H, Barrett D, Bauerle C, Bisaria N, Bradley PH, Breunig JS, Bush E, Cappel D, Capra E, Chen W, Clore J, Combs PA, Doucette C, Demuren O, Fellowes P, Freeman S, Frenkel E, Gadala-Maria D, Gawande R, Glass D, Grossberg S, Gupta A, Hammonds-Odie L, Hoisos A, Hsi J, Hsu YH, Inukai S, Karczewski KJ, Ke X, Kojima M, Leachman S, Lieber D, Liebowitz A, Liu J, Liu Y, Martin T, Mena J, Mendoza R, Myhrvold C, Millian C, Pfau S, Raj S, Rich M, Rokicki J, Rounds W, Salazar M, Salesi M, Sharma R, Silverman S, Singer C, Sinha S, Staller M, Stern P, Tang H, Weeks S, Weidmann M, Wolf A, Young C, Yuan J, Crutchfield C, McClean M, Murphy CT, Llinás M, Botstein D, Troyanskaya OG, Dunham MJ: A new system for comparative functional genomics of *Saccharomyces* yeasts Genetics 195(1): 275-287, 2013. PM23852385

17. Eksi R, Li HD, Menon R, Wen Y, Omenn GS, Kretzler M, Guan Y: Systematically Differentiating Functions for Alternatively Spliced Isoforms through Integrating RNA-seq Data PLoS Comput. Biol. 9(11): 2013. PM24244129
18. Zhu F, Guan Y: Predicting dynamic signaling network response under unseen perturbations Bioinformatics 30(19): 2772-2778, 2014. PM24919880
19. Shi L, Sierant MC, Gurdziel K, Zhu F, Cui S, Kolodziej KE, Strouboulis J, Guan Y, Tanabe O, Lim KC, Engel JD: Biased, Non-equivalent Gene-Proximal and -Distal Binding Motifs of Orphan Nuclear Receptor TR4 in Primary Human Erythroid Cells PLoS Genet. 10(5): 2014. PM24811540
20. Omenn GS, Guan Y, Menon R: A new class of protein cancer biomarker candidates: Differentially expressed splice variants of ERBB2 (HER2/neu) and ERBB1 (EGFR) in breast cancer cell lines J Proteomics 107: 103-112, 2014. PM24802673
21. Bethunaickan R, Berthier CC, Zhang W, Eksi R, Li HD, Guan Y, Kretzler M, Davidson A: Identification of stage-specific genes associated with lupus nephritis and response to remission induction in (NZB × NZW)F1 and NZM2410 mice Arthritis and Rheumatology 66(8): 2246-2258, 2014. PM24757019
22. Li HD, Menon R, Omenn GS, Guan Y: The emerging era of genomic data integration for analyzing splice isoform function Trends Genet. 30(8): 340-347, 2014. PM24951248
23. Shi L, Lin YH, Sierant MC, Zhu F, Cui S, Guan Y, Sartor MA, Tanabe O, Lim KC, Engel JD: Developmental transcriptome analysis of human erythropoiesis Hum. Mol. Genet. 23(17): 4528-4542, 2014. PM24781209
24. Ma Q, Ozel AB, Ramdas S, McGee B, Khuriaty R, Siemieniak D, Li HD, Guan Y, Brody LC, Mills JL, Molloy AM, Ginsburg D, Li JZ, Desch KC: Genetic variants in PLG, LPA, and SIGLEC 14 as well as smoking contribute to plasma plasminogen levels Blood 124(20): 3155-3164, 2014. PM25208887
25. Li HD, Menon R, Omenn GS, Guan Y: Revisiting the identification of canonical splice isoforms through integration of functional genomics and proteomics evidence Proteomics 14(23-24): 2709-2718, 2014. PM25265570
26. Guan Y, Martini S, Mariani LH: Genes Caught In Flagranti: Integrating Renal Transcriptional Profiles With Genotypes and Phenotypes. Semin Nephrol 35(3): 237-44, 2015. PM26215861/PMC4518206
27. Zhu F, Shi L, Engel JD, Guan Y: Regulatory network inferred using expression data of small sample size: application and validation in erythroid system. Bioinformatics 31(15): 2537-44, 2015. PM25840044/PMC4514931
28. Li HD, Menon R, Govindarajoo B, Panwar B, Zhang Y, Omenn GS, Guan Y: Functional Networks of Highest-Connected Splice Isoforms: From The Chromosome 17 Human Proteome Project. J Proteome Res 14(9): 3484-91, 2015. PM26216192/PMC4993635
29. Panwar B, Menon R, Eksi R, Omenn GS, Guan Y: MI-PVT: A Tool for Visualizing the Chromosome-Centric Human Proteome. J Proteome Res 14(9): 3762-7, 2015. PM26204236/PMC4798783
30. Menon R, Panwar B, Eksi R, Kleer C, Guan Y, Omenn GS: Computational Inferences of the Functions of Alternative/Noncanonical Splice Isoforms Specific to HER2+/ER-/PR- Breast Cancers, a Chromosome 17 C-HPP Study. J Proteome Res 14(9): 3519-29, 2015. PM26147891/PMC4760104
31. Horvatovich P, Lundberg EK, Chen YJ, Sung TY, He F, Nice EC, Goode RJ, Yu S, Ranganathan S, Baker MS, Domont GB, Velasquez E, Li D, Liu S, Wang Q, He QY, Menon R, Guan Y, Corrales FJ, Segura V, Casal JI, Pascual-Montano A, Albar JP, Fuentes M, Gonzalez-Gonzalez M, Diez P, Ibarrola N, Degano RM, Mohammed Y, Borchers CH, Urbani A, Soggiu A, Yamamoto T, Salekdeh GH, Archakov A, Ponomarenko E, Lisitsa A, Lichti CF, Mostovenko E, Kroes RA, Rezeli M, Végvári Á, Fehniger TE, Bischoff R, Vizcaíno JA, Deutsch EW, Lane L, Nilsson CL, Marko-Varga G, Omenn GS, Jeong SK, Lim JS, Paik YK, Hancock WS: Quest for missing proteins: Update 2015 on chromosome-centric human proteome project Journal of Proteome Research 14(9): 3415-3431, 2015. PM26076068

32. Allen GI, Amoroso N, Anghel C, Balagurusamy V, Bare CJ, Beaton D, Bellotti R, Bennett DA, Boehme KL, Boutros PC, Caberlotto L, Caloian C, Campbell F, Chaibub Neto E, Chang YC, Chen B, Chen CY, Chien TY, Clark T, Das S, Davatzikos C, Deng J, Dillenberger D, Dobson RJ, Dong Q, Doshi J, Duma D, Errico R, Erus G, Everett E, Fardo DW, Friend SH, Fröhlich H, Gan J, St George-Hyslop P, Ghosh SS, Glaab E, Green RC, Guan Y, Hong MY, Huang C, Hwang J, Ibrahim J, Inglese P, Iyappan A, Jiang Q, Katsumata Y, Kauwe JS, Klein A, Kong D, Krause R, Lalonde E, Lauria M, Lee E, Lin X, Liu Z, Livingstone J, Logsdon BA, Lovestone S, Ma TW, Malhotra A, Mangravite LM, Maxwell TJ, Merrill E, Nagorski J, Namasivayam A, Narayan M, Naz M, Newhouse SJ, Norman TC, Nurtdinov RN, Oyang YJ, Pawitan Y, Peng S, Peters MA, Piccolo SR, Praveen P, Priami C, Sabelnykova VY, Senger P, Shen X, Simmons A, Sotiras A, Stolovitzky G, Tangaro S, Tateo A, Tung YA, Tustison NJ, Varol E, Vradenburg G, Weiner MW, Xiao G, Xie L, Xie Y, Xu J, Yang H, Zhan X, Zhou Y, Zhu F, Zhu H, Zhu S, Alzheimer's Disease Neuroimaging Initiative.: Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease. *Alzheimers Dement* 12(6): 645-53, 2016. PM27079753
33. Li HD, Omenn GS, Guan Y: A proteogenomic approach to understand splice isoform functions through sequence and expression-based computational modeling. *Brief Bioinform* 17(6): 1024-1031, 2016. PM26740460/PMC5142014
34. Zhu F, Panwar B, Guan Y: Algorithms for modeling global and context-specific functional relationship networks. *Brief Bioinform* 17(4): 686-95, 2016. PM26254431/PMC4945826
35. Panwar B, Menon R, Eksi R, Li HD, Omenn GS, Guan Y: Genome-Wide Functional Annotation of Human Protein-Coding Splice Variants Using Multiple Instance Learning. *J Proteome Res* 15(6): 1747-53, 2016. PM27142340
36. Menon S, Lu C, Menon R, Schwartz J, Guan Y: Effects of Antioxidants in Human Cancers: Differential Effects on Non-Coding Intronic RNA Expression. *Antioxidants (Basel)* 5(1): 2016. PM26805894/PMC4808750
37. Zhu F, Panwar B, Dodge HH, Li H, Hampstead BM, Albin RL, Paulson HL, Guan Y: COMPASS: A computational model to predict changes in MMSE scores 24-months after initial assessment of Alzheimer's disease. *Sci Rep* 6: 34567, 2016. PM27703197/PMC5050516
38. Li HD, Menon R, Eksi R, Guerler A, Zhang Y, Omenn GS, Guan Y: A Network of Splice Isoforms for the Mouse. *Sci Rep* 6: 24507, 2016. PM27079421/PMC4832266
39. Sieberts SK, Zhu F, García-García J, Stahl E, Pratap A, Pandey G, Pappas D, Aguilar D, Anton B, Bonet J, Eksi R, Fornés O, Guney E, Li H, Marín MA, Panwar B, Planas-Iglesias J, Poglajen D, Cui J, Falcao AO, Suver C, Hoff B, Balagurusamy VS, Dillenberger D, Neto EC, Norman T, Aittokallio T, Ammad-Ud-Din M, Azencott CA, Bellón V, Boeva V, Bunte K, Chheda H, Cheng L, Corander J, Dumontier M, Goldenberg A, Gopalacharyulu P, Hajiloo M, Hidru D, Jaiswal A, Kaski S, Khalfaoui B, Khan SA, Kramer ER, Marttinen P, Mezlini AM, Molparia B, Pirinen M, Saarela J, Samwald M, Stoven V, Tang H, Tang J, Torkamani A, Vert JP, Wang B, Wang T, Wennerberg K, Wineinger NE, Xiao G, Xie Y, Yeung R, Zhan X, Zhao C, Members of the Rheumatoid Arthritis Challenge Consortium., Greenberg J, Kremer J, Michaud K, Barton A, Coenen M, Mariette X, Miceli C, Shadick N, Weinblatt M, de Vries N, Tak PP, Gerlag D, Huizinga TW, Kurreeman F, Allaart CF, Louis Bridges S Jr, Criswell L, Moreland L, Klareskog L, Saevarsdottir S, Padyukov L, Gregersen PK, Friend S, Plenge R, Stolovitzky G, Oliva B, Guan Y, Mangravite LM, Bridges SL, Criswell L, Moreland L, Klareskog L, Saevarsdottir S, Padyukov L, Gregersen PK, Friend S, Plenge R, Stolovitzky G, Oliva B, Guan Y, Mangravite LM: Crowdsourced assessment of common genetic contribution to predicting anti-TNF treatment response in rheumatoid arthritis. *Nat Commun* 7: 12460, 2016. PM27549343/PMC4996969
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41. Hill SM, Heiser LM, Cokelaer T, Unger M, Nesser NK, Carlin DE, Zhang Y, Sokolov A, Paull EO, Wong CK, Graim K, Bivol A, Wang H, Zhu F, Afsari B, Danilova LV, Favorov AV, Lee WS, Taylor D, Hu CW, Long BL, Noren DP, Bisberg AJ, Mills GB, Gray JW, Kellen M, Norman T, Friend S, Qutub AA, Fertig EJ, Guan Y, Song M, Stuart JM, Spellman PT, Koepll H, Stolovitzky G, Saez-Rodriguez J, Mukherjee S: Inferring causal molecular networks: Empirical assessment through a community-based effort *Nature Methods* 13(4): 310-322, 2016. PM26901648
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45. Keller A, Gerkin RC, Guan Y, Dhurandhar A, Turu G, Szalai B, Mainland JD, Ihara Y, Yu CW, Wolfinger R, Vens C, Schietgat L, De Grave K, Norel R, DREAM Olfaction Prediction Consortium., Stolovitzky G, Cecchi GA, Vosshall LB, Meyer P: Predicting human olfactory perception from chemical features of odor molecules. *Science* 355(6327): 820-826, 2017. PM28219971
46. Li HD, Omenn GS, Guan Y: MIsoMine: A genome-scale high-resolution data portal of expression, function and networks at the splice isoform level in the mouse Database 2015. PM25953081
47. Zhu F, Shi L, Li H, Eksi R, Engel JD, Guan Y: Modeling dynamic functional relationship networks and application to ex vivo human erythroid differentiation *Bioinformatics* 30(23): 3325-3333. PM25115705