



SEX DIFFERENCES IN HEALTH & DISEASE

CSB PRESENTATION 2024

“Our goal is to understand the molecular origins of differences and similarities between females and males throughout the body, in health and disease”



GROUP

MEETING

Tuesdays 10 am – 12 pm

Contact [Jorge Adarme](mailto:adarme@wi.mit.edu) if would like to attend our lab meeting in person.

Email: adarme@wi.mit.edu

CURRENT

LAB MEMBERS

DAVID C. PAGE

Principal Investigator

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Ste. 401 - (617) 258-5203

Member, Whitehead Institute

HHMI Investigator

Professor, MIT Biology Dept.

Graduate Students

[Amulya Aluru](#) (MIT EECS)

Hannah Harris (MIT Bio)

[Shruthi Rengarajan](#) (MIT Bio)

Maya Talukdar (HMS BIG)

Will Barr (MIT Bio)

Erik Owen (MIT CSB)

Finn Thompson (MIT Bio)

[Sophie VanderWeele](#) (MIT BE)

Neha Bokil (MIT Bio)

Ian Sabula (MIT Bio)

Postdocs

[Jordana Bloom](#)

Marla Tharp

Lukas [Chmatal](#)

Alisa White

Rebecca Harris

Research Staff

Lab Manager: Laura Brown

Computational Biologists: Helen [Skaletsky](#), [Linyong Mao](#)

Research Scientists: Jennifer Hughes, Winston [Bellott](#), Laura Blanton



Video: Sex differences in height



Video: The Colbert Report



Video: Why Sex Matter in Health & Disease



Video: Scientific American

SELECTED

PUBLICATIONS

- San Roman AK, Skaletsky H, Godfrey AK, Bokil NV, Teitz L, Singh I, Blanton LV, Bellott DW, Pyntikova T, Lange J, Koutseva N, Hughes JF, Brown L, Phou S, Buscetta A, Kruszka P, Banks N, Dutra A, Pak E, Lasutschinkow PC, Keen C, Davis SM, Lin AE, Tartaglia NR, Samango-Sprouse C, Muenke M, Page DC (2024) *The human Y and inactive X chromosomes similarly modulate autosomal gene expression.* Cell Genomics 4, 100462**
- San Roman AK, Godfrey AK, Skaletsky H, Bellott DW, Groff AF, Harris HL, Blanton LV, Hughes JF, Brown LG, Phou S, Buscetta A, Kruszka P, Banks N, Dutra A, Pak E, Lasutschinkow PC, Keen C, Davis SM, Tartaglia NR, Samango-Sprouse C, Muenke M, Page DC (2023) *The human inactive X chromosome modulates expression of the active X chromosome.* Cell Genomics 3, 100259**
- Bellott DW, Cho TJ, Jackson EK, Skaletsky H, Hughes JF, Page DC (2022) *SHIMS 3.0: Highly efficient single-haplotype iterative mapping and sequencing using ultra-long nanopore reads.* PLOS One 17, e0269692**
- Jackson EK, Bellott DW, Cho TJ, Skaletsky H, Hughes JF, Pyntikova T, Page DC (2021) *Large palindromes on the primate X chromosome are preserved by natural selection.* Genome Res 31:1337-52**
- Bellott DW, Page DC (2021) *Dosage-sensitive functions in embryonic development drove the survival of genes on sex-specific chromosomes in snakes, birds, and mammals.* Genome Res 31:198-210**
- Hughes JF, Skaletsky H, Pyntikova T, Koutseva N, Raudsepp T, Brown LG, Bellot DW, Cho TJ, Dugan-Rocha S, Khan Z, Kremitzki C, Fronick C, Graves-Lindsay TA, Fulton L, Warren WC, Wilson RK, Owens E, Womack JE, Murphy WJ, Muzny DM, Worley KC, Chowdhary BP, Gibbs RA, Page DC (2020) *Sequence analysis in Bos taurus reveals pervasiveness of X-Y arms races in mammalian lineages.* Genome Res 30:1716-26**
- Mikedis MM, Fan Y, Nicholls PK, Endo T, Jackson EK, Cobb SA, de Rooij DG, Page DC (2020) *DAZL mediates a broad translational program regulating expansion and differentiation of spermatogonial progenitors.* eLife 9:e56523**
- Godfey AK, Naqvi S, Chmatal L, Chick JM, Mitchell RN, Gygi SP, Skaletsky H, Page DC (2020) *Quantitative analysis of Y-chromosome gene expression across 36 human tissues.* Genome Res 30:860-73**
- Nicholls PK, Schorle H, Naqvi S, Hu YC, Fan Y, Carmell MA, Dobrinski I, Watson AL, Carlson DF, Fahrenkrug SC, Page DC (2019) *Mammalian germ cells are determined after PGC colonization of the nascent gonad.* PNAS 116:25677**
- Naqvi S, Godfrey AK, Hughes JF, Goodheart ML, Mitchell RN, Page DC (2019) *Conservation, acquisition, and functional impact of sex-biased gene expression in mammals.* Science 366, eaaw7317**

SELECTED

PUBLICATIONS

- Kojima ML**, de Rooij DG, Page DC (2019) *Amplification of a broad transcriptional program by a common factor triggers the meiotic cell cycle in mice.* *eLife* e43738
- Lesch BJ**, Tothova Z, Morgan EA, Liao Z, Bronson RT, Ebert BL, Page DC (2019) *Intergenerational epigenetic inheritance of cancer susceptibility in mammals.* *eLife* 8: e39380
- Naqvi S**, Bellott DW, Lin KS, Page DC (2018) *Conserved microRNA targeting reveals preexisting gene dosage sensitivities that shaped amniote sex chromosome evolution.* *Genome Res* 28: 474
- Bellott DW**, Skaletsky H, Cho TJ, Brown LG, Locke D, Chen N, Galkina S, Pyntikova T, Koutseva N, Graves T, Kremitzki C, Warren WC, Clark AG, Gaginskaya E, Wilson RK, Page DC (2017) *Avian W and mammalian Y chromosomes convergently retained dosage-sensitive regulators.* *Nat Genet* 49:387-94
- Hughes JF**, Skaletsky H, Koutseva N, Pyntikova T, Page DC (2015) *Sex chromosome-to-autosome transposition events counter Y-chromosome gene loss in mammals.* *Genome Biol* 16:104
- Soh YQS**, Alföldi J, Pyntikova T, Brown LG, Graves T, Minx PJ, Fulton RS, Kremitzki C, Koutseva N, Mueller JL, Rozen S, Hughes JF, Owens E, Womack JE, Murphy WJ ... Skaletsky H, Page DC (2014) *Sequencing the mouse Y chromosome reveals convergent gene acquisition and amplification on both sex chromosomes.* *Cell* 159: 800-13
- Bellott DW**, Hughes JF, Skaletsky H, Brown LG, Pyntikova T, Cho TJ, Koutseva N, Zaghlul S, Graves T, Rock S, Kremitzki C, Fulton RS, Dugan S, Ding Y, Morton D ... Page DC (2014) *Mammalian Y chromosomes retain widely expressed, dosage-sensitive regulators.* *Nature* 508: 494
- Mueller JL**, Skaletsky H, Brown LG, Zaghlul S, Rock S, Grave T, Auger K, Warren WC, Wilson RK, Page DC (2013) *Independent specialization of the human and mouse X chromosomes for the male germline.* *Nat Genet* 45:1083-7
- Hughes JF**, Skaletsky H, Brown LG, Pyntikova T, Graves TA, Fulton RS, Dugan S, Ding Y, Buhay CJ, Kremitzki C, Wang Q, Shen H, Holder M, Villasana D, Nazareth LV, Cree A, Courtney L, Veizer J, Kotkiewicz H, Cho T, Koutseva N, Rozen S, Muzny DM, Warren WC, Gibbs RA, Wilson RK, Page DC (2012) *Strict evolutionary conservation followed rapid gene loss on human and rhesus Y chromosomes.* *Nature* 483: 82-6



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Publications List

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Whitehead Institute
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