Stanford

Michelle Whirl-Carrillo

Principal Investigator and Director, ClinPGx, Biomedical Data Science

Bio

CURRENT ROLE AT STANFORD

Principal Investigator and Director, PharmGKB/ClinPGx

EDUCATION AND CERTIFICATIONS

- PhD, Stanford University , Biophysics
- SB, Massachusetts Institute of Technology , Biology

PROJECTS

- ClinPGx - Stanford University/St. Jude Children's Research Hospital
- Pharmacogenomics Knowledge Base (PharmGKB) - Stanford University
- Clinical Pharmacogenetics Implementation Consortium (CPIC) - Stanford/St. Jude Children's Research Hospital
- Pharmacogenomics Clinical Annotation Tool (PharmCAT) - Stanford/UPenn
- Clinical Genome Resource (ClinGen) - Stanford University

LINKS

- ClinPGx: https://clinpgx.org
- CPIC: https://cpicpgx.org
- PharmCAT: https://pharmcat.org
- ClinGen PGx Interpretation Committee: https://clinicalgenome.org/working-groups/pharmacogenomics/
- PharmGKB: https://www.pharmgkb.org
- NIH Biosketch: https://www.ncbi.nlm.nih.gov/myncbi/michelle.whirl-carrillo.1/cv/581204/

Teaching

COURSES

2024-25

- Principles of Pharmacogenomics: BIOMEDIN 224, GENE 224 (Aut, Spr)

2023-24

- Principles of Pharmacogenomics: BIOMEDIN 224, GENE 224 (Aut, Spr)

Professional

PROFESSIONAL INTERESTS

My work focuses on pharmacogenomics, the study of the impact of genetics on drug response, and its application to personalized medicine and personal genomics. My interests range from basic research studying gene-variant-drug associations to translation of pharmacogenomics information into the clinical setting, including reducing barriers to implementing PGx prescribing guidelines in the clinical electronic environment (CDS/EHR). I am particularly interested in translation of human genome sequencing data to pharmacogenomic-based therapeutic recommendations that are actionable in the clinic.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Member, Pharmacogenomic Global Research Network
- Member, International Society for Biocuration
- Member, American Society of Human Genetics
- Member, American Medical Informatics Association

Publications

PUBLICATIONS

- **CLINPGX: A COMPREHENSIVE PHARMACOGENOMICS RE-SOURCE WITH TOOLS FOR ACCESSING CLINICAL GUIDANCE BY GENOTYPE**
  Whirl-Carrillo, M., Sangkuhl, K., Gong, L., Whaley, R., Woon, M., Thorn, C., Keseler, I., Klein, C., Tsermpini, E., Caudle, K., Ritchie, M., Klein, T.
  WILEY.2025
- **Advancing Precision Medicine Through the New Pharmacogenomics Global Research Network** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
  Giacomini, K. M., Karnes, J. H., Crews, K. R., Monte, A. A., Murphy, W. A., Oni-Orisan, A., Ramsey, L. B., Yang, J. J., Whirl-Carrillo, M.
  2021
- **An evidence-based framework for evaluating pharmacogenomics knowledge for personalized medicine.** *Clinical pharmacology and therapeutics*
  Whirl-Carrillo, M., Huddart, R., Gong, L., Sangkuhl, K., Thorn, C. F., Whaley, R., Klein, T. E.
  2021
- **Pharmacogenomics Clinical Annotation Tool (PharmCAT).** *Clinical pharmacology and therapeutics*
  Sangkuhl, K., Whirl-Carrillo, M., Whaley, R. M., Woon, M., Lavertu, A., Altman, R. B., Carter, L., Verma, A., Ritchie, M. D., Klein, T. E.
  2019
- **Standardizing terms for clinical pharmacogenetic test results: consensus terms from the Clinical Pharmacogenetics Implementation Consortium (CPIC).** *Genetics in medicine*
  Caudle, K. E., Dunnenberger, H. M., Freimuth, R. R., Peterson, J. F., Burlison, J. D., Whirl-Carrillo, M., Scott, S. A., Rehm, H. L., Williams, M. S., Klein, T. E., Relling, M. V., Hoffman, J. M.
  2016
- **Pharmacogenomics Knowledge for Personalized Medicine** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
  Whirl-Carrillo, M., MCDONAGH, E. M., Hebert, J. M., Gong, L., Sangkuhl, K., Thorn, C. F., Altman, R. B., Klein, T. E.
  2012; 92 (4): 414-417
- **An XML-based interchange format for genotype-phenotype data** *HUMAN MUTATION*
  Whirl-Carrillo, M., Woon, M., Thorn, C. E., Klein, T. E., Altman, R. B.
  2008; 29 (2): 212-219
- **Mining biochemical information: Lessons taught by the ribosome** *RNA-A PUBLICATION OF THE RNA SOCIETY*
  Whirl-Carrillo, M., Gabashvili, I. S., Bada, M., Banatao, D. R., Altman, R. B.
  2002; 8 (3): 279-289

- **CLINICAL FUNCTIONAL ASSIGNMENT OF DPYD VARIANTS BY THE CLINICAL PHARMACOGENETICS IMPLEMENTATION CONSORTIUM (CPIC) PHARMACOGENE CURATION EXPERT PANEL**
  Tibben, B., Amstutz, U., Whirl-Carrillo, M., Gaedigk, A., Khan, W. A., van den Bosch, B., Lopez-Fernandez, L. A., Turner, A., White, C., Zembutsu, H., Smith, D., Largiader, C. R., Schwab, et al
  WILEY.2026: S38-S39

- **Clinical Functional Assignment of TPMT and NUDT15 Alleles by the Clinical Pharmacogenetics Implementation Consortium Pharmacogene Curation Expert Panel.** *Clinical pharmacology and therapeutics*
  Tibben, B. M., Maillard, M., Pratt, V. M., Moyer, A. M., Figueroa, D. M., Whirl-Carrillo, M., Gaedigk, A., Stocco, G., Schwab, M., Caudle, K. E., Yang, J. J.
  2026

- **Knowledge and Attitudes on Germline Pharmacogenomic Testing Among Clinical Oncologists.** *JCO precision oncology*
  Monroe, M., Naik, H., Ford, J. M., Whirl-Carrillo, M., Klein, T. E., Hertz, D. L., Scott, S. A.
  2026; 10 (8): e2600353

- **Clinical Function Assignment of NAT2 Alleles by the Clinical Pharmacogenetics Implementation Consortium Pharmacogene Curation Expert Panel.** *Clinical pharmacology and therapeutics*
  Tibben, B. M., Hein, D. W., Whirl-Carrillo, M., Gaedigk, A., Eadon, M. T., Minchin, R. F., Boukouvala, S., Santos, A. R., Donnelly, R. S., Agúndez, J. A., Caudle, K. E.
  2026

- **PharmVar GeneFocus: CYP1A2-Clinical Impact, Genetic Variation, and Updated Nomenclature.** *Clinical pharmacology and therapeutics*
  Monostory, K., Villapalos Garcia, G., Koller, D., Adams, S., Bousman, C. A., Tsermpini, E. E., Whirl-Carrillo, M., Turner, A. J., Lauschke, V. M., Nagy, M., Boone, E. C., Klein, T. E., Zubiaur, et al
  2026

- **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2D6 Genotype and Use of 5-HT3Receptor Antagonists: 2026 Update.** *Clinical pharmacology and therapeutics*
  Moore, C., Bourque, M. S., Halman, A., Agundez, J. A., Prows, C. A., Hikino, K., Schwab, M., Oxencis, C. J., Chauhan, D., Diekstra, M. H., Long, S. E., Bell, G. C., Gaedigk, et al
  2026

- **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for Thiopurine Dosing Based on TPMT and NUDT15 Genotypes: 2025 Update.** *Clinical pharmacology and therapeutics*
  Maillard, M., Schwab, M., Whirl-Carrillo, M., Moyer, A. M., Suarez-Kurtz, G., Pui, C., Stein, C. M., Klein, T. E., Spahn, C., Kwon, S., Hartono, J. L., de Boer, N. K., Ahmad, et al
  2026

- **PharmVar GeneFocus: NAT2-Genetic Variation and Updated Nomenclature.** *Clinical pharmacology and therapeutics*
  Papanikolaou, G., Poloni, E. S., Agúndez, J. A., Teixeira, R. L., Boone, E. C., Rezende Santos, A., Whirl-Carrillo, M., Sangkuhl, K., Klein, T. E., Habil, M. R., Fakis, G., Minchin, R. F., Hein, et al
  2025

- **PGxQA: A Resource for Evaluating LLM Performance for Pharmacogenomic QA Tasks.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Keat, K., Venkatesh, R., Huang, Y., Kumar, R., Tuteja, S., Sangkuhl, K., Li, B., Gong, L., Whirl-Carrillo, M., Klein, T. E., Ritchie, M. D., Kim, D.
  2025; 30: 229-246

- **An Update to the Clinical Pharmacogenetics Implementation Consortium (CPIC) SLCO1B1 Allele Functionality Table Leveraging Evidence from Participants of Predominantly Sub-Saharan African Ancestry.** *Clinical pharmacology and therapeutics*
  Oni-Orisan, A., Yee, S. W., Haldar, T., Whirl-Carillo, M., Caudle, K., Voora, D., Kim, R. B.
  2025

- **The Clinical Pharmacogenetics Implementation Consortium's consensus-based framework for assigning allele function.** *American journal of human genetics*
  Tibben, B. M., Gaedigk, A., Gong, L., Sangkuhl, K., Whirl-Carrillo, M., Relling, M. V., Donnelly, R. S., Klein, T. E., Caudle, K. E.
  2025

- **Clinical Pharmacogenetics Implementation Consortium Guideline for NAT2 Genotype and Hydralazine Therapy.** *Clinical pharmacology and therapeutics*

Eadon, M. T., Hein, D. W., Andersen, M. A., Chapman, A. B., Cooper-DeHoff, R. M., Desta, Z., Duarte, J. D., Elchynski, A. L., Gaedigk, A., Karol, S. E., Limdi, N. A., Lteif, C., Sosinski, et al

2025

- **Advancing Clinical Pharmacogenomics Worldwide Through the Clinical Pharmacogenetics Implementation Consortium (CPIC).** *Clinical pharmacology and therapeutics*

  Caudle, K. E., Whirl-Carrillo, M., Relling, M. V., Hoffman, J. M., Donnelly, R. S., Haidar, C. E., Bourque, M. S., Frear, S., Gong, L., Sangkuhl, K., Whaley, R., Klein, T. E.

  2025

- **Towards an integrated resource for pharmacogenomics (PGx): Survey findings from the genomic medicine communities.** *Genetics in medicine : official journal of the American College of Medical Genetics*

  Klein, C. J., Gong, L., Caudle, K. E., Naik, H., Empey, P. E., Hoffman, J. M., Scherer, S., Iwuchukwu, O. F., Gregornik, D., Monte, A. A., Swen, J. J., Scott, S. A., Whirl-Carrillo, et al

  2025: 101529

- **CLINICAL FUNCTIONAL ASSIGNMENT OF NAT2 VARIANT ALLELES BY THE CPIC PHARMACOGENE CURATION EXPERT PANEL**

  Tibben, B., Hein, D., Whirl-Carrillo, M., Gaedigk, A., Eadon, M., Minchin, R., Boukouvala, S., Rezende, S. A., Donnelly, R., Caudle, K., Agundez, J.

  WILEY.2025

- **Progress in Pharmacogenomics Implementation in the United States: Barrier Erosion and Remaining Challenges.** *Clinical pharmacology and therapeutics*

  Smith, D. M., Douglas, M. P., Aquilante, C. L., Deverka, P. A., Devine, B., Dunnenberger, H. M., Empey, P. E., Hertz, D. L., Monte, A. A., Moyer, A. M., Patel, J. N., Pratt, V. M., Saulsberry, et al

  2025

- **PGxQA: A Resource for Evaluating LLM Performance for Pharmacogenomic QA Tasks.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*

  Keat, K., Venkatesh, R., Huang, Y., Kumar, R., Tuteja, S., Sangkuhl, K., Li, B., Gong, L., Whirl-Carrillo, M., Klein, T. E., Ritchie, M. D., Kim, D.

  2025; 30: 229-246

- **Integrating Pharmacogenomics into the Broader Construct of Genomic Medicine: Efforts by the ClinGen Pharmacogenomics Working Group (PGxWG).** *Clinical chemistry*

  Gong, L., Klein, C. J., Caudle, K. E., Moyer, A. M., Scott, S. A., Whirl-Carrillo, M., Klein, T. E.

  2025; 71 (1): 36-44

- **PGxQA: A Resource for Evaluating LLM Performance for Pharmacogenomic QA Tasks**

  Keat, K., Venkatesh, R., Huang, Y., Kumar, R., Tuteja, S., Sangkuhl, K., Li, B., Gong, L., Whirl-Carrillo, M., Klein, T. E., Ritchie, M. D., Kim, D.

  edited by Altman, R. B., Hunter, L., Ritchie, M. D., Murray, T., Klein, T. E.

  WORLD SCIENTIFIC PUBL CO PTE LTD.2025: 229-246

- **PharmVar GeneFocus: CYP4F2.** *Clinical pharmacology and therapeutics*

  Zubiaur, P., Rodríguez-Antona, C., Boone, E. C., Daly, A. K., Tsermpini, E. E., Khasawneh, L. Q., Sangkuhl, K., Duconge, J., Botton, M. R., Savieo, J., Nofziger, C., Whirl-Carrillo, M., Klein, et al

  2024

- **The Value of Clinical Pharmacogenomic Guidelines That Recommend Standard of Care Over Genotype-Based Prescribing.** *Clinical pharmacology and therapeutics*

  Donnelly, R. S., Whirl-Carrillo, M., Klein, T. E., Caudle, K. E.

  2024

- **PharmVar GeneFocus: CYP2A6.** *Clinical pharmacology and therapeutics*

  Langlois, A. W., Chenoweth, M. J., Twesigomwe, D., Scantamburlo, G., Whirl-Carrillo, M., Sangkuhl, K., Klein, T. E., Nofziger, C., Tyndale, R. F., Gaedigk, A.

  2024

- **DPYD Genotyping Recommendations: A Joint Consensus Recommendation of the Association for Molecular Pathology, American College of Medical Genetics and Genomics, Clinical Pharmacogenetics Implementation Consortium, College of American Pathologists, Dutch Pharmacogenetics Working Group of the Royal Dutch Pharmacists Association, European Society for Pharmacogenomics and Personalized Therapy, Pharmacogenomics Knowledgebase, and Pharmacogene Variation Consortium.** *The Journal of molecular diagnostics : JMD*

Pratt, V. M., Cavallari, L. H., Fulmer, M. L., Gaedigk, A., Hachad, H., Ji, Y., Kalman, L. V., Ly, R. C., Moyer, A. M., Scott, S. A., Turner, A. J., van Schaik, R. H., Whirl-Carrillo, et al
2024

- **Clinical Pharmacogenetics Implementation Consortium Guideline for CYP2B6 Genotype and Methadone Therapy.** *Clinical pharmacology and therapeutics*
  Robinson, K. M., Eum, S., Desta, Z., Tyndale, R. F., Gaedigk, A., Crist, R. C., Haidar, C. E., Myers, A. L., Samer, C. F., Somogyi, A. A., Zubiaur, P., Iwuchukwu, O. F., Whirl-Carrillo, et al
  2024

- **From sample to star alleles: a long-read pharmacogenomics pipeline powered by Twist target enrichment and PacBio HiFi sequencing**
  Holt, S., Harting, J., Han, T., Arbiza, L., Kingan, S., Souppe, A., Zhang, S., Baybayan, P., Lambert, C., Ferrao, H., Li, B., Sangkuhl, K., Woon, et al
  SPRINGERNATURE.2024: 701-702

- **Highly Scalable Pharmacogenomic Panel Testing with Hybrid Capture and Long-Read Sequencing**
  Gonzaludo, N., Kingan, S., Harting, J., Baybayan, P., Han, T., Arbiza, L., Li, B., Sangkuhl, K., Woon, M., Whaley, R., Whirl-Carrillo, M., Yang, Y., Klein, et al
  LIPPINCOTT WILLIAMS & WILKINS.2023: 183

- **PharmGKB summary: disulfiram pathway.** *Pharmacogenetics and genomics*
  Gonzalez-Suarez, A. D., Thorn, C. F., Whirl-Carrillo, M., Klein, T. E.
  2023

- **Frequencies of pharmacogenomic alleles across biogeographic groups in a large-scale biobank.** *American journal of human genetics*
  Li, B., Sangkuhl, K., Whaley, R., Woon, M., Keat, K., Whirl-Carrillo, M., Ritchie, M. D., Klein, T. E.
  2023

- **PharmVar Tutorial on CYP2D6 Structural Variation Testing and Recommendations on Reporting.** *Clinical pharmacology and therapeutics*
  Turner, A. J., Nofziger, C., Ramey, B. E., Ly, R. C., Bousman, C. A., Agúndez, J. A., Sangkuhl, K., Whirl-Carrillo, M., Vanoni, S., Dunnenberger, H. M., Ruano, G., Kennedy, M. A., Phillips, et al
  2023

- **CYP3A4 and CYP3A5 Genotyping Recommendations: A Joint Consensus Recommendation of the Association for Molecular Pathology, Clinical Pharmacogenetics Implementation Consortium, College of American Pathologists, Dutch Pharmacogenetics Working Group of the Royal Dutch Pharmacists Association, European Society for Pharmacogenomics and Personalized Therapy, and Pharmacogenomics Knowledgebase.** *The Journal of molecular diagnostics : JMD*
  Pratt, V. M., Cavallari, L. H., Fulmer, M. L., Gaedigk, A., Hachad, H., Ji, Y., Kalman, L. V., Ly, R. C., Moyer, A. M., Scott, S. A., van Schaik, R. H., Whirl-Carrillo, M., Weck, et al
  2023

- **An Introductory Tutorial on Cardiovascular Pharmacogenetics for Healthcare Providers.** *Clinical pharmacology and therapeutics*
  Oni-Orisan, A., Tuteja, S., Hoffecker, G., Smith, D. M., Castrichini, M., Crews, K. R., Murphy, W. A., Nguyen, N. H., Huang, Y., Lteif, C., Friede, K. A., Tantisira, K., Aminkeng, et al
  2023

- **Session Introduction: Precision Medicine: Using Artificial Intelligence to Improve Diagnostics and Healthcare.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Whirl-Carrillo, M., Brenner, S. E., Chen, J. H., Crawford, D. C., Kidzinski, L., Ouyang, D., Daneshjou, R.
  2023; 28: 257-262

- **Precision Medicine: Using Artificial Intelligence to Improve Diagnostics and Healthcare**
  Whirl-Carrillo, M., Brenner, S. E., Chen, J. H., Crawford, D. C., Kidzinski, L., Ouyang, D., Daneshjou, R.
  edited by Altman, R. B., Hunter, L., Ritchie, M. D., Murray, T., Klein, T. E.
  WORLD SCIENTIFIC PUBL CO PTE LTD.2023: 257-262

- **Evaluating the frequency and the impact of pharmacogenetic alleles in an ancestrally diverse Biobank population.** *Journal of translational medicine*
  Verma, S. S., Keat, K., Li, B., Hoffecker, G., Risman, M., Sangkuhl, K., Whirl-Carrillo, M., Dudek, S., Verma, A., Klein, T. E., Ritchie, M. D., Tuteja, S.
  2022; 20 (1): 550

- **How to Run the Pharmacogenomics Clinical Annotation Tool (PharmCAT).** *Clinical pharmacology and therapeutics*
  Li, B., Sangkuhl, K., Keat, K., Whaley, R. M., Woon, M., Verma, S., Dudek, S., Tuteja, S., Verma, A., Whirl-Carrillo, M., Ritchie, M. D., Klein, T. E.

2022

- **Expanded Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for Medication Use in the Context of G6PD Genotype.** *Clinical pharmacology and therapeutics*
  Gammal, R. S., Pirmohamed, M., Somogyi, A. A., Morris, S. A., Formea, C. M., Elchynski, A. L., Oshikoya, K. A., McLeod, H. L., Haidar, C. E., Whirl-Carrillo, M., Klein, T. E., Caudle, K. E., Relling, et al
  2022

- **TPMT and NUDT15 Genotyping Recommendations: A Joint Consensus Recommendation of the Association for Molecular Pathology, Clinical Pharmacogenetics Implementation Consortium, College of American Pathologists, Dutch Pharmacogenetics Working Group of the Royal Dutch Pharmacists Association, European Society for Pharmacogenomics and Personalized Therapy, and Pharmacogenomics Knowledgebase.** *The Journal of molecular diagnostics : JMD*
  Pratt, V. M., Cavallari, L. H., Fulmer, M. L., Gaedigk, A., Hachad, H., Ji, Y., Kalman, L. V., Ly, R. C., Moyer, A. M., Scott, S. A., van Schaik, R. H., Whirl-Carrillo, M., Weck, et al
  2022

- **PharmGKB summary: acyclovir/ganciclovir pathway.** *Pharmacogenetics and genomics*
  Maillard, M., Gong, L., Nishii, R., Yang, J. J., Whirl-Carrillo, M., Klein, T. E.
  2022; 32 (5): 201-208

- **PharmGKB summary: heparin-induced thrombocytopenia pathway, adverse drug reaction.** *Pharmacogenetics and genomics*
  Miller, E., Norwood, C., Giles, J. B., Huddart, R., Karnes, J. H., Whirl-Carrillo, M., Klein, T. E.
  1800

- **An Investigation of the Knowledge Overlap between Pharmacogenomics and Disease Genetics.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Li, B., Whirl-Carrillo, M., Wright, M. W., Babb, L., Rehm, H. L., Klein, T. E.
  2022; 27: 385-396

- **PharmVar GeneFocus: CYP3A5.** *Clinical pharmacology and therapeutics*
  Rodriguez-Antona, C., Savieo, J. L., Lauschke, V. M., Sangkuhl, K., Drögemöller, B. I., Wang, D., van Schaik, R. H., Gilep, A. A., Peter, A. P., Boone, E. C., Ramey, B. E., Klein, T. E., Whirl-Carrillo, et al
  2022

- **PharmGKB, an Integrated Resource of Pharmacogenomic Knowledge.** *Current protocols*
  Gong, L., Whirl-Carrillo, M., Klein, T. E.
  2021; 1 (8): e226

- **PharmVar GeneFocus: CYP2C9.** *Clinical pharmacology and therapeutics*
  Sangkuhl, K., Claudio-Campos, K., Cavallari, L. H., Agundez, J., Whirl-Carrillo, M., Duconge, J., Del Tredici, A. L., Wadelius, M., Botton, M. R., Woodahl, E. L., Scott, S. A., Klein, T. E., Pratt, et al
  2021

- **PharmVar: A Global Resource and Repository for Pharmacogene Variation.** *Clinical pharmacology and therapeutics*
  Gaedigk, A., Casey, S. T., Whirl-Carrillo, M., Miller, N. A., Klein, T. E.
  2021

- **Clinical Pharmacogenetics Implementation Consortium (CPIC) guideline for the use of aminoglycosides based on MT-RNR1 genotype.** *Clinical pharmacology and therapeutics*
  McDermott, J. H., Wolf, J., Hoshitsuki, K., Huddart, R., Caudle, K. E., Whirl-Carrillo, M., Steyger, P. S., Smith, R. J., Cody, N., Rodriguez-Antona, C., Klein, T. E., Newman, W. G.
  2021

- **PharmVar GeneFocus: CYP2B6.** *Clinical pharmacology and therapeutics*
  Desta, Z. n., El-Boraie, A. n., Gong, L. n., Somogyi, A. A., Lauschke, V. M., Dandara, C. n., Klein, K. n., Miller, N. n., Klein, T. E., Tyndale, R. F., Whirl-Carrillo, M. n., Gaedigk, A. n.
  2021

- **Recommendations for Clinical CYP2D6 Genotyping Allele Selection: A Joint Consensus Recommendation of the Association for Molecular Pathology, College of American Pathologists, Dutch Pharmacogenetics Working Group of the Royal Dutch Pharmacists Association, and European Society for Pharmacogenomics and Personalized Therapy.** *The Journal of molecular diagnostics : JMD*

Pratt, V. M., Cavallari, L. H., Del Tredici, A. L., Gaedigk, A., Hachad, H., Ji, Y., Kalman, L. V., Ly, R. C., Moyer, A. M., Scott, S. A., van Schaik, R. H., Whirl-Carrillo, M., Weck, et al
2021

- **Pharmacogenetics at Scale: An Analysis of the UK Biobank.** *Clinical pharmacology and therapeutics*
  McInnes, G., Lavertu, A., Sangkuhl, K., Klein, T. E., Whirl-Carrillo, M., Altman, R. B.
  2020
- **Transfer learning enables prediction of CYP2D6 haplotype function.** *PLoS computational biology*
  McInnes, G., Dalton, R., Sangkuhl, K., Whirl-Carrillo, M., Lee, S., Tsao, P. S., Gaedigk, A., Altman, R. B., Woodahl, E. L.
  2020; 16 (11): e1008399
- **Pharmacogenetic information in Swiss drug labels - a systematic analysis.** *The pharmacogenomics journal*
  Jeiziner, C., Suter, K., Wernli, U., Barbarino, J. M., Gong, L., Whirl-Carrillo, M., Klein, T. E., Szucs, T. D., Hersberger, K. E., Meyer Zu Schwabedissen, H. E.
  2020
- **PharmGKB tutorial for pharmacogenomics of drugs potentially used in the context of COVID-19.** *Clinical pharmacology and therapeutics*
  Huddart, R., Whirl-Carrillo, M., Altman, R. B., Klein, T. E.
  2020
- **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2C9 and HLA-B Genotypes and Phenytoin Dosing: 2020 Update.** *Clinical pharmacology and therapeutics*
  Karnes, J. H., Rettie, A. E., Somogyi, A. A., Huddart, R., Fohner, A. E., Formea, C. M., Lee, M. T., Llerena, A., Whirl-Carrillo, M., Klein, T. E., Phillips, E. J., Mintzer, S., Gaedigk, et al
  2020
- **Recommendations for Clinical Warfarin Genotyping Allele Selection A Report of the Association for Molecular Pathology and the College of American Pathologists** *JOURNAL OF MOLECULAR DIAGNOSTICS*
  Pratt, V. M., Cavallari, L. H., Del Tredici, A. L., Hachad, H., Ji, Y., Kalman, L. V., Ly, R. C., Moyer, A. M., Scott, S. A., Whirl-Carrillo, M., Weck, K. E.
  2020; 22 (7): 847–59
- **PharmVar GeneFocus: CYP2C19.** *Clinical pharmacology and therapeutics*
  Botton, M. R., Whirl-Carrillo, M., Del Tredici, A. L., Sangkuhl, K., Cavallari, L. H., Agundez, J. A., Duconge, J., Lee, M. T., Woodahl, E. L., Claudio-Campos, K., Daly, A. K., Klein, T. E., Pratt, et al
  2020
- **Response to: Unveiling the guidance heterogeneity for genome-informed drug treatment interventions among regulatory bodies and research consortia.** *Pharmacological research*
  Huddart, R. n., Li, G. n., Sangkuhl, K. n., Thorn, C. F., Whirl-Carrillo, M. n., Caudle, K. E., Relling, M. V., Klein, T. E.
  2020: 104838
- **PGxMine: Text mining for curation of PharmGKB.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
  Lever, J. n., Barbarino, J. M., Gong, L. n., Huddart, R. n., Sangkuhl, K. n., Whaley, R. n., Whirl-Carrillo, M. n., Woon, M. n., Klein, T. E., Altman, R. B.
  2020; 25: 611–22
- **PGxMine: Text mining for curation of PharmGKB**
  Lever, J., Barbarino, J. M., Gong, L., Huddart, R., Sangkuhl, K., Whaley, R., Whirl-Carrillo, M., Woon, M., Klein, T. E., Altman, R. B.
  edited by Altman, R. B., Dunker, A. K., Hunter, L., Ritchie, M. D., Murray, T., Klein, T. E.
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