



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)

2022-23

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

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 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-Carrillo, 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

- **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
- **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
- **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
- **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
- **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., Fornea, 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.
WORLD SCIENTIFIC PUBL CO PTE LTD.2020: 611-622

● **Variant Interpretation in Current Pharmacogenetic Testing.** *Journal of personalized medicine*

Luvsantseren, S. n., Whirl-Carrillo, M. n., Sangkuhl, K. n., Shin, N. n., Wen, A. n., Empey, P. n., Alam, B. n., David, S. n., Dunnenberger, H. M., Orlando, L. n., Altman, R. n., Palaniappan, L. n.
2020; 10 (4)

● **PharmVar and the Landscape of Pharmacogenetic Resources.** *Clinical pharmacology and therapeutics*

Gaedigk, A., Whirl-Carrillo, M., Pratt, V. M., Miller, N. A., Klein, T. E.
2019

● **PharmVar GeneReview: CYP2D6.** *Clinical pharmacology and therapeutics*

Nofziger, C., Turner, A. J., Sangkuhl, K., Whirl-Carrillo, M., Agundez, J. A., Black, J. L., Dunnenberger, H. M., Ruano, G., Kennedy, M. A., Phillips, M. S., Hachad, H., Klein, T. E., Gaedigk, et al
2019

● **Are Randomized Controlled Trials Necessary to Establish the Value of Implementing Pharmacogenomics in the Clinic?** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

Huddart, R., Sangkuhl, K., Whirl-Carrillo, M., Klein, T. E.
2019; 106 (2): 284–86

● **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2B6 and Efavirenz-Containing Antiretroviral Therapy** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

Desta, Z., Gammal, R. S., Gong, L., Whirl-Carrillo, M., Gaur, A. H., Sukasem, C., Hockings, J., Myers, A., Swart, M., Tyndale, R. F., Masimirembwa, C., Iwuchukwu, O. F., Chirwa, et al
2019

● **Standardized Biogeographic Grouping System for Annotating Populations in Pharmacogenetic Research** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

Huddart, R., Fohner, A. E., Whirl-Carrillo, M., Wojcik, G. L., Gignoux, C. R., Popejoy, A. B., Bustamante, C. D., Altman, R. B., Klein, T. E.
2019; 105 (5): 1256–62

● **Pharmacogene Variation Consortium Gene Introduction: NUDT15** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

Yang, J. J., Whirl-Carrillo, M., Scott, S. A., Turner, A. J., Schwab, M., Tanaka, Y., Suarez-Kurtz, G., Schaeffeler, E., Klein, T. E., Miller, N. A., Gaedigki, A.
2019; 105 (5): 1091–94

● **Clinical Pharmacogenetics Implementation Consortium Guideline for Thiopurine Dosing Based on TPMT and NUDT15 Genotypes: 2018 Update** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

Relling, M., Schwab, M., Whirl-Carrillo, M., Suarez-Kurtz, G., Pui, C., Stein, C. M., Moyer, A. M., Evans, W. E., Klein, T. E., Guillermo Antillon-Klussmann, F., Caudle, K. E., Kato, M., Yeoh, et al
2019; 105 (5): 1095–1105

● **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2B6 and Efavirenz-containing Antiretroviral Therapy.** *Clinical pharmacology and therapeutics*

Desta, Z., Gammal, R. S., Gong, L., Whirl-Carrillo, M., Gaur, A. H., Sukasem, C., Hockings, J., Myers, A., Swart, M., Tyndale, R., Masimirembwa, C., Iwuchukwu, O. F., Chirwa, et al
2019

● **Are Randomized Controlled Trials Necessary to Establish the Value of Implementing Pharmacogenomics in the Clinic?** *Clinical pharmacology and therapeutics*

Huddart, R., Sangkuhl, K., Whirl-Carrillo, M., Klein, T. E.
2019

● **BIOINFORMATICS: ACCUMULATING AND IMPLEMENTING PHARMACOGENOMICS INFORMATION**

Whirl-Carrillo, M.

JAPANESE SOC STUDY XENOBIOTICS.2019: S6

- **Standardizing CYP2D6 Genotype to Phenotype Translation: Consensus Recommendations from the Clinical Pharmacogenetics Implementation Consortium and Dutch Pharmacogenetics Working Group.** *Clinical and translational science*
Caudle, K. E., Sangkuhl, K. n., Whirl-Carrillo, M. n., Swen, J. J., Haidar, C. E., Klein, T. E., Gammal, R. S., Relling, M. V., Scott, S. A., Hertz, D. L., Guchelaar, H. J., Gaedigk, A. n.
2019
- **The Clinical Pharmacogenetics Implementation Consortium: 10 Years Later.** *Clinical pharmacology and therapeutics*
Relling, M. V., Klein, T. E., Gammal, R. S., Whirl-Carrillo, M. n., Hoffman, J. M., Caudle, K. E.
2019
- **Recommendations for Clinical CYP2C9 Genotyping Allele Selection: A Joint Recommendation of the Association for Molecular Pathology and College of American Pathologists.** *The Journal of molecular diagnostics : JMD*
Pratt, V. M., Cavallari, L. H., Del Tredici, A. L., Hachad, H. n., Ji, Y. n., Moyer, A. M., Scott, S. A., Whirl-Carrillo, M. n., Weck, K. E.
2019
- **The Evolution of PharmVar.** *Clinical pharmacology and therapeutics*
Gaedigk, A., Sangkuhl, K., Whirl-Carrillo, M., Twist, G. P., Klein, T. E., Miller, N. A., PharmVar Steering Committee
2018
- **Pharmacogene Variation Consortium Gene Introduction: NUDT15.** *Clinical pharmacology and therapeutics*
Yang, J. J., Whirl-Carrillo, M., Scott, S. A., Turner, A. J., Schwab, M., Tanaka, Y., Suarez-Kurtz, G., Schaeffeler, E., Klein, T. E., Miller, N. A., Gaedigk, A.
2018
- **Standardized biogeographic grouping system for annotating populations in pharmacogenetic research.** *Clinical pharmacology and therapeutics*
Huddart, R., Fohner, A. E., Whirl-Carrillo, M., Wojcik, G. L., Gignoux, C. R., Popejoy, A. B., Bustamante, C. D., Altman, R. B., Klein, T. E.
2018
- **Clinical Pharmacogenetics Implementation Consortium (CPIC) guideline for thiopurine dosing based on TPMT and NUDT15 genotypes: 2018 update.** *Clinical pharmacology and therapeutics*
Relling, M. V., Schwab, M., Whirl-Carrillo, M., Suarez-Kurtz, G., Pui, C., Stein, C. M., Moyer, A. M., Evans, W. E., Klein, T. E., Antillon-Klussmann, F. G., Caudle, K. E., Kato, M., Yeoh, et al
2018
- **Essential characteristics of pharmacogenomics study publications.** *Clinical pharmacology and therapeutics*
Thorn, C. F., Whirl-Carrillo, M., Hachad, H., Johnson, J. A., McDonagh, E. M., Ratain, M. J., Relling, M. V., Scott, S. A., Altman, R. B., Klein, T. E.
2018
- **Standardization can accelerate the adoption of pharmacogenomics: current status and the path forward** *PHARMACOGENOMICS*
Caudle, K. E., Keeling, N. J., Klein, T. E., Whirl-Carrillo, M., Pratt, V. M., Hoffman, J. M.
2018; 19 (10): 847–60
- **Pharmacogenomics and big genomic data: from lab to clinic and back again.** *Human molecular genetics*
Lavertu, A., McInnes, G., Daneshjou, R., Whirl-Carrillo, M., Klein, T. E., Altman, R. B.
2018; 27 (R1): R72–R78
- **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2D6 and Tamoxifen Therapy** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Goetz, M. P., Sangkuhl, K., Guchelaar, H., Schwab, M., Province, M., Whirl-Carrillo, M., Symmans, W., McLeod, H. L., Ratain, M. J., Zembutsu, H., Gaedigk, A., van Schaik, R. H., Ingle, et al
2018; 103 (5): 770–77
- **Comparison of the Guidelines of the Clinical Pharmacogenetics Implementation Consortium and the Dutch Pharmacogenetics Working Group** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Bank, P. D., Caudle, K. E., Swen, J. J., Gammal, R. S., Whirl-Carrillo, M., Klein, T. E., Relling, M. V., Guchelaar, H.
2018; 103 (4): 599–618
- **Clinical Pharmacogenetics Implementation Consortium Guideline for HLA Genotype and Use of Carbamazepine and Oxcarbazepine: 2017 Update** *CLINICAL PHARMACOLOGY & THERAPEUTICS*

- Phillips, E. J., Sukasem, C., Whirl-Carrillo, M., Mueller, D. J., Dunnenberger, H. M., Chantratita, W., Goldspiel, B., Chen, Y., Carleton, B. C., George, A. L., Mushiroda, T., Klein, T., Gammal, et al
2018; 103 (4): 574–81
- **THE PHARMACOGENE VARIATION CONSORTIUM: INCORPORATION OF THE HUMAN CYTOCHROME P450 ALLELE NOMENCLATURE DATABASE.**
Gaedigk, A., Klein, T. E., Twist, G. P., Whirl-Carrillo, M., Miller, N. A.
WILEY.2018: S67
 - **The Pharmacogene Variation (PharmVar) Consortium: Incorporation of the Human Cytochrome P450 (CYP) Allele Nomenclature Database** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Gaedigk, A., Ingelman-Sundberg, M., Miller, N. A., Leeder, J., Whirl-Carrillo, M., Klein, T. E., PharmVar Steering Comm
2018; 103 (3): 399–401
 - **PharmGKB: A worldwide resource for pharmacogenomic information.** *Wiley interdisciplinary reviews. Systems biology and medicine*
Barbarino, J. M., Whirl-Carrillo, M., Altman, R. B., Klein, T. E.
2018
 - **Clinical pharmacogenetics implementation consortium (cpic) guideline for pharmacogenetics-guided warfarin dosing: 2017 update.** *Clinical pharmacology & therapeutics*
Johnson, J. A., Caudle, K. E., Gong, L., Whirl-Carrillo, M., Stein, C. M., Scott, S. A., Lee, M. T., Gage, B. F., Kimmel, S. E., Perera, M. A., Anderson, J. L., Pirmohamed, M., Klein, et al
2017
 - **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.
2017; 19 (2): 215-223
 - **"The Pharmacogenomics Research Network Translational Pharmacogenetics Program: Outcomes and Metrics of Pharmacogenetic Implementations Across Diverse Healthcare Systems".** *Clinical pharmacology & therapeutics*
Luzum, J. A., Pakyz, R. E., Eelsey, A. R., Haidar, C. E., Peterson, J. F., Whirl-Carrillo, M., Handelman, S. K., Palmer, K., Pulley, J. M., Beller, M., Schildcrout, J. S., Field, J. R., Weitzel, et al
2017
 - **PharmGKB summary: ivacaftor pathway, pharmacokinetics/pharmacodynamics** *PHARMACOGENETICS AND GENOMICS*
Fohner, A. E., McDonagh, E. M., Clancy, J. P., Carrillo, M. W., Altman, R. B., Klein, T. E.
2017; 27 (1): 39-42
 - **Prediction of CYP2D6 phenotype from genotype across world populations** *GENETICS IN MEDICINE*
Gaedigk, A., Sangkuhl, K., Whirl-Carrillo, M., Klein, T., Leeder, J. S.
2017; 19 (1): 69-76
 - **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for CYP2D6 Genotype and Use of Ondansetron and Tropisetron.** *Clinical pharmacology & therapeutics*
Bell, G. C., Caudle, K. E., Whirl-Carrillo, M., Gordon, R. J., Hikino, K., Prows, C. A., Gaedigk, A., Agundez, J. A., Sadhasivam, S., Klein, T. E., Schwab, M.
2016
 - **Evidence and resources to implement pharmacogenetic knowledge for precision medicine** *AMERICAN JOURNAL OF HEALTH-SYSTEM PHARMACY*
Caudle, K. E., Gammal, R. S., Whirl-Carrillo, M., Hoffman, J. M., Belling, M. V., Klein, T. E.
2016; 73 (23): 1977-1985
 - **Evidence and resources to implement pharmacogenetic knowledge for precision medicine.** *American journal of health-system pharmacy*
Caudle, K. E., Gammal, R. S., Whirl-Carrillo, M., Hoffman, J. M., Relling, M. V., Klein, T. E.
2016; 73 (23): 1977-1985
 - **PharmGKB summary: ivacaftor pathway, pharmacokinetics/pharmacodynamics.** *Pharmacogenetics and genomics*
Fohner, A. E., McDonagh, E. M., Clancy, J. P., Whirl Carrillo, M., Altman, R. B., Klein, T. E.

2016: -?

- **Prediction of CYP2D6 phenotype from genotype across world populations.** *Genetics in medicine*
Gaedigk, A., Sangkuhl, K., Whirl-Carrillo, M., Klein, T., Leeder, J. S.
2016
- **Developing knowledge resources to support precision medicine: principles from the Clinical Pharmacogenetics Implementation Consortium (CPIC)** *JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION*
Hoffman, J. M., Dunnenberger, H. M., Hicks, J. K., Caudle, K. E., Carrillo, M. W., Freimuth, R. R., Williams, M. S., Klein, T. E., Peterson, J. F.
2016; 23 (4): 796-801
- **Developing knowledge resources to support precision medicine: principles from the Clinical Pharmacogenetics Implementation Consortium (CPIC).** *Journal of the American Medical Informatics Association*
Hoffman, J. M., Dunnenberger, H. M., Kevin Hicks, J., Caudle, K. E., Whirl Carrillo, M., Freimuth, R. R., Williams, M. S., Klein, T. E., Peterson, J. F.
2016; 23 (4): 796-801
- **Novel Disease-Drug Database Demonstrating Applicability for Pharmacogenomic-Based Prescribing.** *Clinical pharmacology & therapeutics*
Whirl-Carrillo, M., Sangkuhl, K., Gong, L., Klein, T. E.
2016
- **Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline for UGT1A1 and Atazanavir Prescribing.** *Clinical pharmacology & therapeutics*
Gammal, R. S., Court, M. H., Haidar, C. E., Iwuchukwu, O. F., Gaur, A. H., Alvarellos, M., Guillemette, C., Lennox, J. L., Whirl-Carrillo, M., Brummel, S. S., Ratain, M. J., Klein, T. E., Schackman, et al
2016; 99 (4): 363-369
- **Pharmacogenetic allele nomenclature: International workgroup recommendations for test result reporting.** *Clinical pharmacology & therapeutics*
Kalman, L. V., Agúndez, J., Appell, M. L., Black, J. L., Bell, G. C., Boukouvala, S., Bruckner, C., Bruford, E., Caudle, K., Coulthard, S. A., Daly, A. K., Tredici, A. D., den Dunnen, et al
2016; 99 (2): 172-185
- **Sequence to Medical Phenotypes: A Framework for Interpretation of Human Whole Genome DNA Sequence Data** *PLOS GENETICS*
Dewey, F. E., Grove, M. E., Priest, J. R., Waggott, D., Batra, P., Miller, C. L., Wheeler, M., Zia, A., Pan, C., Karzcewski, K. J., Miyake, C., Whirl-Carrillo, M., Klein, et al
2015; 11 (10)
- **Enabling the curation of your pharmacogenetic study.** *Clinical pharmacology & therapeutics*
MCDONAGH, E. M., Whirl-Carrillo, M., Altman, R. B., Klein, T. E.
2015; 97 (2): 116-119
- **A twentieth anniversary tribute to psb.** *Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing*
Hewett, D., Whirl-Carrillo, M., Hunter, L. E., Altman, R. B., Klein, T. E.
2015; 20: 1-7
- **PharmGKB summary: very important pharmacogene information for CYP4F2** *PHARMACOGENETICS AND GENOMICS*
Alvarellos, M. L., Sangkuhl, K., Daneshjou, R., Whirl-Carrillo, M., Altman, R. B., Klein, T. E.
2015; 25 (1): 41-47
- **Clinical Pharmacogenetics Implementation Consortium Guidelines for CYP2C9 and HLA-B Genotypes and Phenytoin Dosing** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Caudle, K. E., Rettie, A. E., Whirl-Carrillo, M., Smith, L. H., Mintzer, S., Lee, M. T., Klein, T. E., Callaghan, J. T.
2014; 96 (5): 542-548
- **Clinical pharmacogenetics implementation consortium guidelines for CYP2C9 and HLA-B genotypes and phenytoin dosing.** *Clinical pharmacology & therapeutics*
Caudle, K. E., Rettie, A. E., Whirl-Carrillo, M., Smith, L. H., Mintzer, S., Lee, M. T., Klein, T. E., Callaghan, J. T.
2014; 96 (5): 542-548
- **In silico comparative characterization of pharmacogenomic missense variants** *BMC GENOMICS*
Li, B., Seligman, C., Thusberg, J., Miller, J. L., Auer, J., Whirl-Carrillo, M., Capriotti, E., Klein, T. E., Mooney, S. D.

2014; 15

- **Clinical interpretation and implications of whole-genome sequencing.** *JAMA : the journal of the American Medical Association*
Dewey, F. E., Grove, M. E., Pan, C., Goldstein, B. A., Bernstein, J. A., Chaib, H., Merker, J. D., Goldfeder, R. L., Enns, G. M., David, S. P., Pakdaman, N., Ormond, K. E., Caleshu, et al
2014; 311 (10): 1035-1045
- **Incorporation of Pharmacogenomics into Routine Clinical Practice: the Clinical Pharmacogenetics Implementation Consortium (CPIC) Guideline Development Process.** *Current drug metabolism*
Caudle, K. E., Klein, T. E., Hoffman, J. M., Muller, D. J., Whirl-Carrillo, M., Gong, L., McDonagh, E. M., Sangkuhl, K., Thorn, C. F., Schwab, M., Agundez, J. A., Freimuth, R. R., Huser, et al
2014; 15 (2): 209-217
- **PharmGKB summary: very important pharmacogene information for the epidermal growth factor receptor.** *Pharmacogenetics and genomics*
Hodoglugil, U., Carrillo, M. W., Hebert, J. M., Karachaliou, N., Rosell, R. C., Altman, R. B., Klein, T. E.
2013; 23 (11): 636-642
- **Clinical pharmacogenetics implementation consortium guidelines for hla-B genotype and carbamazepine dosing.** *Clinical pharmacology & therapeutics*
Leckband, S. G., Kelsoe, J. R., Dunnenberger, H. M., George, A. L., Tran, E., Berger, R., Müller, D. J., Whirl-Carrillo, M., Caudle, K. E., Pirmohamed, M.
2013; 94 (3): 324-328
- **The Pharmacogenomics Research Network Translational Pharmacogenetics Program: Overcoming Challenges of Real-World Implementation** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Shuldiner, A. R., RELLING, M. V., Peterson, J. F., Hicks, J. K., Freimuth, R. R., Sadee, W., Pereira, N. L., Roden, D. M., Johnson, J. A., Klein, T. E.
2013; 94 (2): 207-210
- **Challenges in the Pharmacogenomic Annotation of Whole Genomes** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Altman, R. B., Whirl-Carrillo, M., Klein, T. E.
2013; 94 (2): 211-213
- **Clinical Pharmacogenetics Implementation Consortium Guidelines for Thiopurine Methyltransferase Genotype and Thiopurine Dosing: 2013 Update** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Relling, M. V., Gardner, E. E., Sandborn, W. J., Schmiegelow, K., Pui, C., Yee, S. W., Stein, C. M., Carrillo, M., Evans, W. E., Hicks, J. K., Schwab, M., Klein, T. E.
2013; 93 (4): 324-325
- **PharmGKB summary: very important pharmacogene information for cytochrome P-450, family 2, subfamily A, polypeptide 6** *PHARMACOGENETICS AND GENOMICS*
McDonagh, E. M., Wassenaar, C., David, S. P., Tyndale, R. F., Altman, R. B., Whirl-Carrillo, M., Klein, T. E.
2012; 22 (9): 695-708
- **PharmGKB summary: phenytoin pathway** *PHARMACOGENETICS AND GENOMICS*
Thorn, C. F., Whirl-Carrillo, M., Leeder, J. S., Klein, T. E., Altman, R. B.
2012; 22 (6): 466-470
- **Using ODIN for a PharmGKB revalidation experiment** *DATABASE-THE JOURNAL OF BIOLOGICAL DATABASES AND CURATION*
Rinaldi, F., Clematide, S., Garten, Y., Whirl-Carrillo, M., Gong, L., Hebert, J. M., Sangkuhl, K., Thorn, C. F., Klein, T. E., Altman, R. B.
2012
- **Personal Omics Profiling Reveals Dynamic Molecular and Medical Phenotypes** *CELL*
Chen, R., Mias, G. I., Li-Pook-Than, J., Jiang, L., Lam, H. Y., Chen, R., Miriami, E., Karczewski, K. J., Hariharan, M., Dewey, F. E., Cheng, Y., Clark, M. J., Im, et al
2012; 148 (6): 1293-1307
- **From pharmacogenomic knowledge acquisition to clinical applications: the PharmGKB as a clinical pharmacogenomic biomarker resource** *BIOMARKERS IN MEDICINE*
McDonagh, E. M., Whirl-Carrillo, M., Garten, Y., Altman, R. B., Klein, T. E.
2011; 5 (6): 795-806

- **Clinical Pharmacogenetics Implementation Consortium Guidelines for CYP2C9 and VKORC1 Genotypes and Warfarin Dosing** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Johnson, J. A., Gong, L., Whirl-Carrillo, M., Gage, B. F., Scott, S. A., Stein, C. M., Anderson, J. L., Kimmel, S. E., Lee, M. T., Pirmohamed, M., Wadelius, M., Klein, T. E., Altman, et al
2011; 90 (4): 625-629
- **Phased Whole-Genome Genetic Risk in a Family Quartet Using a Major Allele Reference Sequence** *PLOS GENETICS*
Dewey, F. E., Chen, R., Cordero, S. P., Ormond, K. E., Caleshu, C., Karczewski, K. J., Whirl-Carrillo, M., Wheeler, M. T., Dudley, J. T., Byrnes, J. K., Cornejo, O. E., Knowles, J. W., Woon, et al
2011; 7 (9)
- **PharmGKB summary: fluoropyrimidine pathways** *PHARMACOGENETICS AND GENOMICS*
Thorn, C. F., Marsh, S., Carrillo, M. W., McLeod, H. L., Klein, T. E., Altman, R. B.
2011; 21 (4): 237-242
- **Clinical Pharmacogenetics Implementation Consortium Guidelines for Thiopurine Methyltransferase Genotype and Thiopurine Dosing** *CLINICAL PHARMACOLOGY & THERAPEUTICS*
Relling, M. V., Gardner, E. E., Sandborn, W. J., Schmiegelow, K., Pui, C., Yee, S. W., Stein, C. M., Carrillo, M., Evans, W. E., Klein, T. E.
2011; 89 (3): 387-391
- **The BioPAX community standard for pathway data sharing** *NATURE BIOTECHNOLOGY*
Demir, E., Cary, M. P., Paley, S., Fukuda, K., Lemer, C., Vastrik, I., Wu, G., D'Eustachio, P., Schaefer, C., Luciano, J., Schacherer, F., Martinez-Flores, I., Hu, et al
2010; 28 (9): 935-942
- **Cytochrome P450 2C9-CYP2C9** *PHARMACOGENETICS AND GENOMICS*
Van Booven, D., Marsh, S., McLeod, H., Carrillo, M. W., Sangkuhl, K., Klein, T. E., Altman, R. B.
2010; 20 (4): 277-281
- **Taxane pathway** *PHARMACOGENETICS AND GENOMICS*
Oshiro, C., Marsh, S., McLeod, H., Carrillo, M. W., Klein, T., Altman, R.
2009; 19 (12): 979-983
- **The pharmacogenetics and pharmacogenomics knowledge base: accentuating the knowledge** *NUCLEIC ACIDS RESEARCH*
Hernandez-Boussard, T., Whirl-Carrillo, M., Hebert, J. M., Gong, L., Owen, R., Gong, M., Gor, W., Liu, F., Truong, C., Whaley, R., Woon, M., Zhou, T., Altman, et al
2008; 36: D913-D918
- **Pacific Symposium on Biocomputing--computational approaches for pharmacogenomics.** *Pharmacogenomics*
Wilke, R. A., Carrillo, M. W., Ritchie, M. D.
2005; 6 (2): 111-113
- **A resource to acquire and summarize pharmacogenetics knowledge in the literature** *11th World Congress on Medical Informatics*
Rubin, D. L., Carrillo, M., Woon, M., Conroy, J., Klein, T. E., Altman, R. B.
I O S PRESS.2004: 793-797
- **Ribosomal dynamics inferred from variations in experimental measurements** *RNA-A PUBLICATION OF THE RNA SOCIETY*
Gabashvili, I. S., Whirl-Carrillo, M., Bada, M., Banatao, D. R., Altman, R. B.
2003; 9 (11): 1301-1307
- **Scoring functions sensitive to alignment error have a more difficult search: A paradox for threading** *Symposium held in Honor of William N Lipscomb on Structures and Mechanisms*
Chang, J., Carrillo, M. W., Waugh, A., Wei, L. P., Altman, R. B.
AMER CHEMICAL SOC.2002: 309-320
- **Calculation of the relative geometry of tRNAs in the ribosome from directed hydroxyl-radical probing data** *RNA-A PUBLICATION OF THE RNA SOCIETY*
Joseph, S., Whirl, M. L., Kondo, D., Noller, H. F., Altman, R. B.
2000; 6 (2): 220-232
- **Evidence of oxidative stress in mdx mouse muscle: Studies of the pre-necrotic state** *JOURNAL OF THE NEUROLOGICAL SCIENCES*

Disatnik, M. H., Dhawan, J., Yu, Y., Beal, M. F., Whirl, M. M., Franco, A. A., Rando, T. A.
1998; 161 (1): 77-84

● **MUTAGENESIS OF VITAMIN-K-DEPENDENT CARBOXYLASE DEMONSTRATES A CARBOXYL TERMINUS-MEDIATED INTERACTION WITH VITAMIN-K HYDROQUINONE** *JOURNAL OF BIOLOGICAL CHEMISTRY*

Roth, D. A., Whirl, M. L., VELAZQUEZESTADES, L. J., Walsh, C. T., Furie, B., Furie, B. C.
1995; 270 (10): 5305-5311