R as the Core Technology to Support Modeling and Simulation in Pharma Research, Development, and Post Approval Activities

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Founder & CEO
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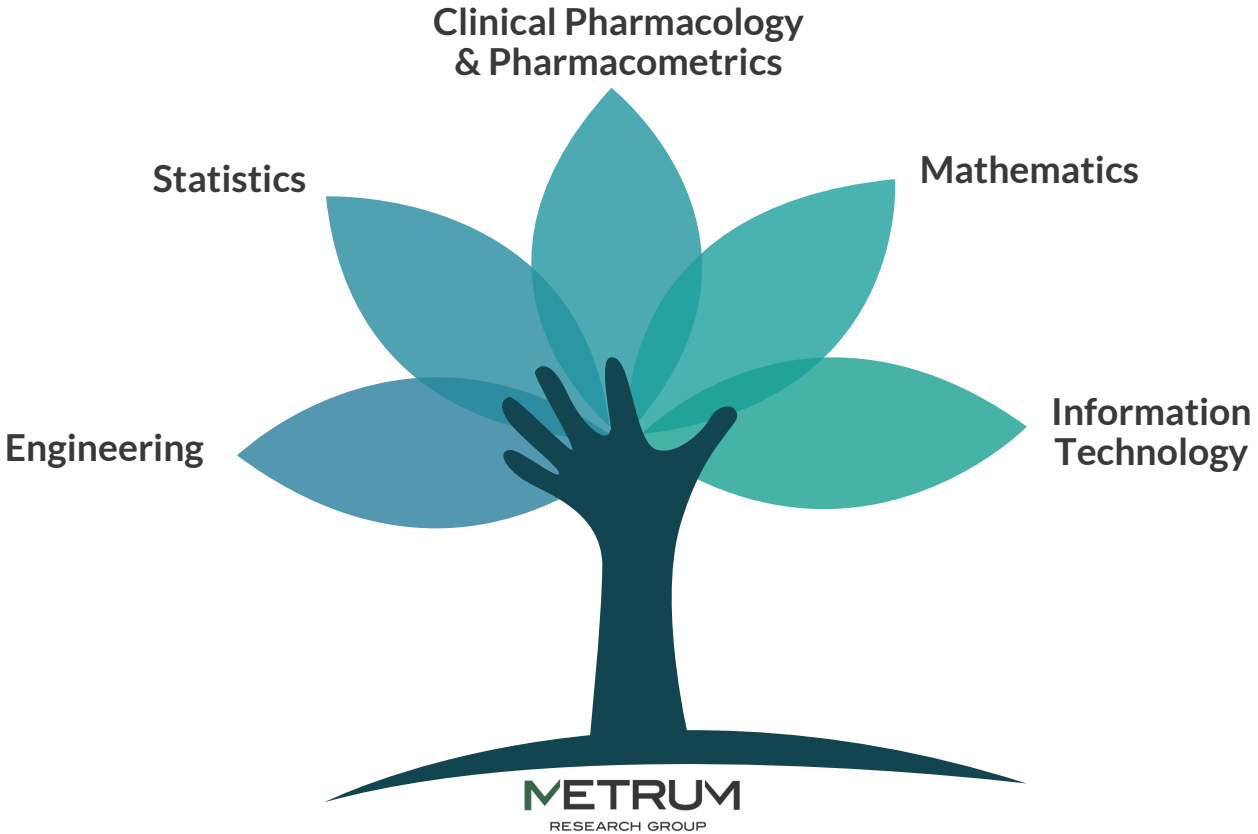
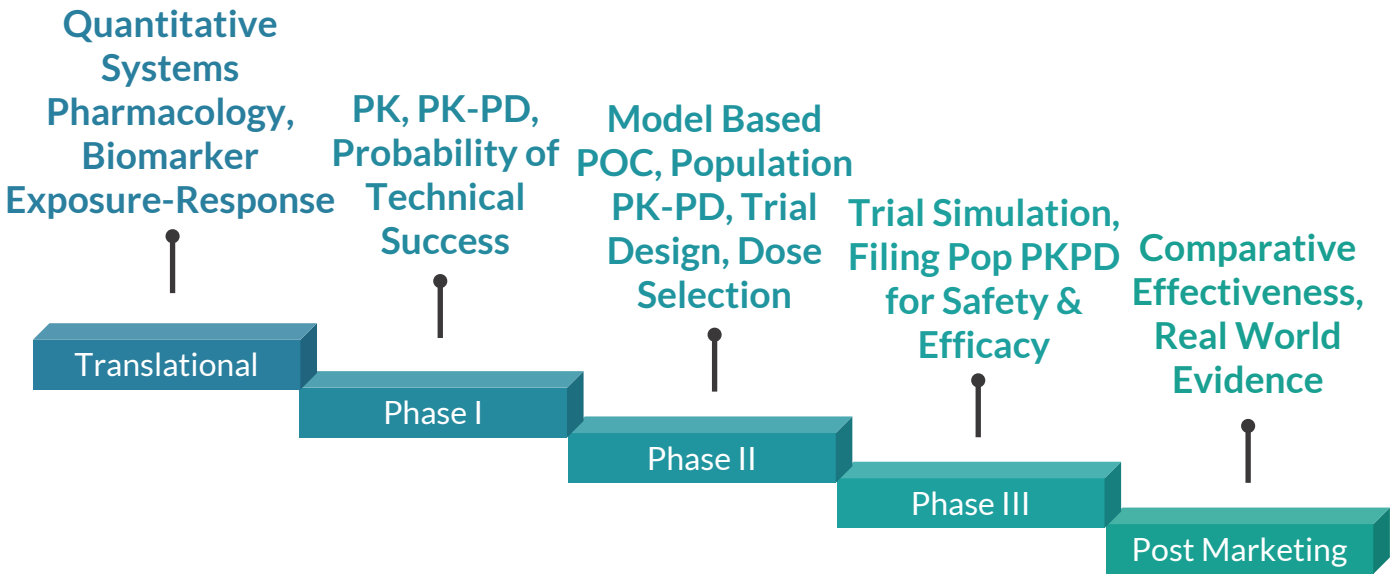
Who We Are

Founded in 2004, Metrum Research Group is a multidisciplinary team.



Model-Informed Drug Development

Just some of the methods and services we provide throughout development programs.



Off-The-Shelf Disease Area Platform Content: Disease Progression, Quantitative Systems Pharmacology, Competitor Model-Based Meta-Analysis, Trial Simulation Tools

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Strategic Modeling and Simulation

General Hourly Consulting Services - Fixed Scope Contract Research Projects - Collaborative Scientific Partnership

Understanding Translational & Systems Pharmacology	Probability of Technical Success	Quantitative Due Diligence Assessment	Dose Selection
Trial Design Evaluation & Optimization	Comparative Effectiveness	Internal Decision Support	Preparation of Regulatory Documents

Therapeutic Areas and Regulatory Settings

small molecules, biologics, diagnostics, devices

>150 Sponsors	>500 Projects	>100 Regulatory Filings
Bone Health	Cardiovascular	Neurodegeneration
Ophthalmology	Pediatrics	Pain
Infectious Disease	Hematology	Inflammation
Oncology	Rare & Ultra Rare Disease	Immunology
Growth and Development	CNS	Endocrine & Metabolic Disorders

Open Source Tools

Growing the science with open-source tools

At Metrum Research Group, we are strong advocates of open-source software development efforts. We make several of the useful tools we've developed (or co-developed) for our own work available as free, open-source software.

- mrgsolve
- metrumrg
- nmqual
- qapply
- fork
- review

- SASexport
- audited
- BUGSModelLibrary
- BUGSParallel
- Torsten (Stan PKPD)

Training Workshops and Open Courseware

We offer open, free training courses and materials as well as custom, fee-based workshops.

- R Programming
- Intro & Advanced Pop PKPD
- Intro through Advanced Bayesian Data Analysis
- Categorical, Count, Time-To-Event Models
- Model-Based Meta-Analysis
- Exposure-Response Models
- Intro and Advanced Stan for PKPD Modeling
- Simulation Concepts and Strategies
- PKPD Simulation with mrgsolve
- Metworx Elastic Cloud Computing
- PBPK Modeling (with mrgsolve)
- Systems Pharmacology (with mrgsolve)
- R-Shiny Web Apps for Decision Making
- Communication of M&S to Non-Technical Audiences

On site

YouTube courses

Online/ Webinars

Partnerships with scientific meetings

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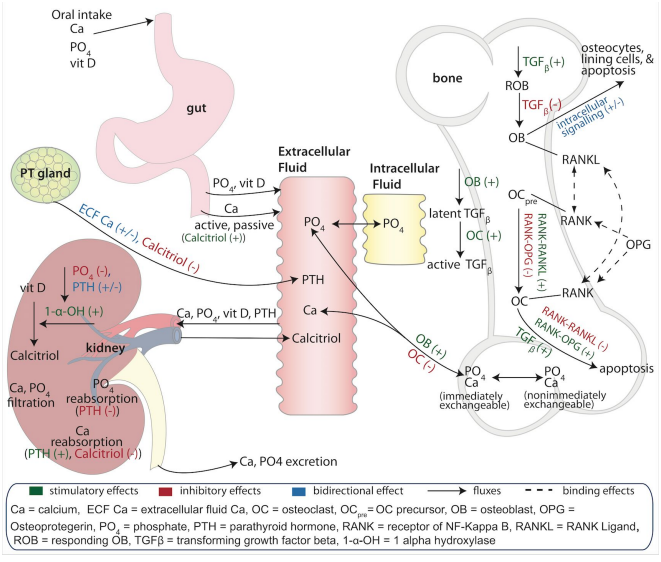
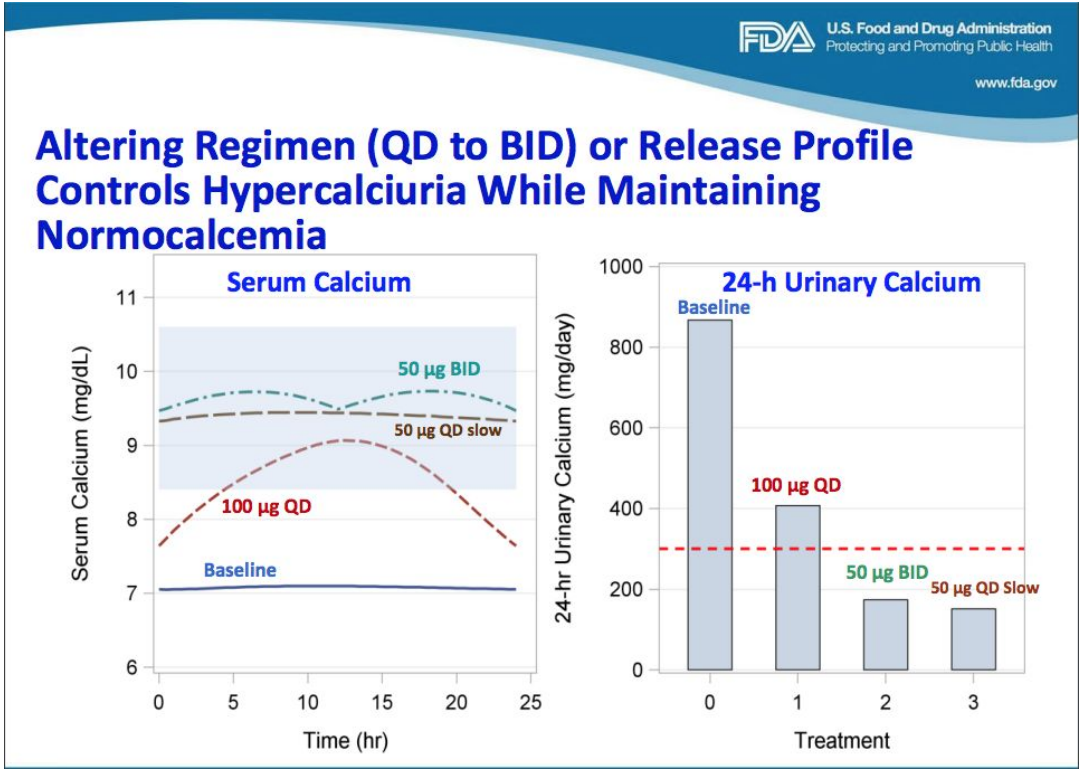
Open Models Utility & Impact



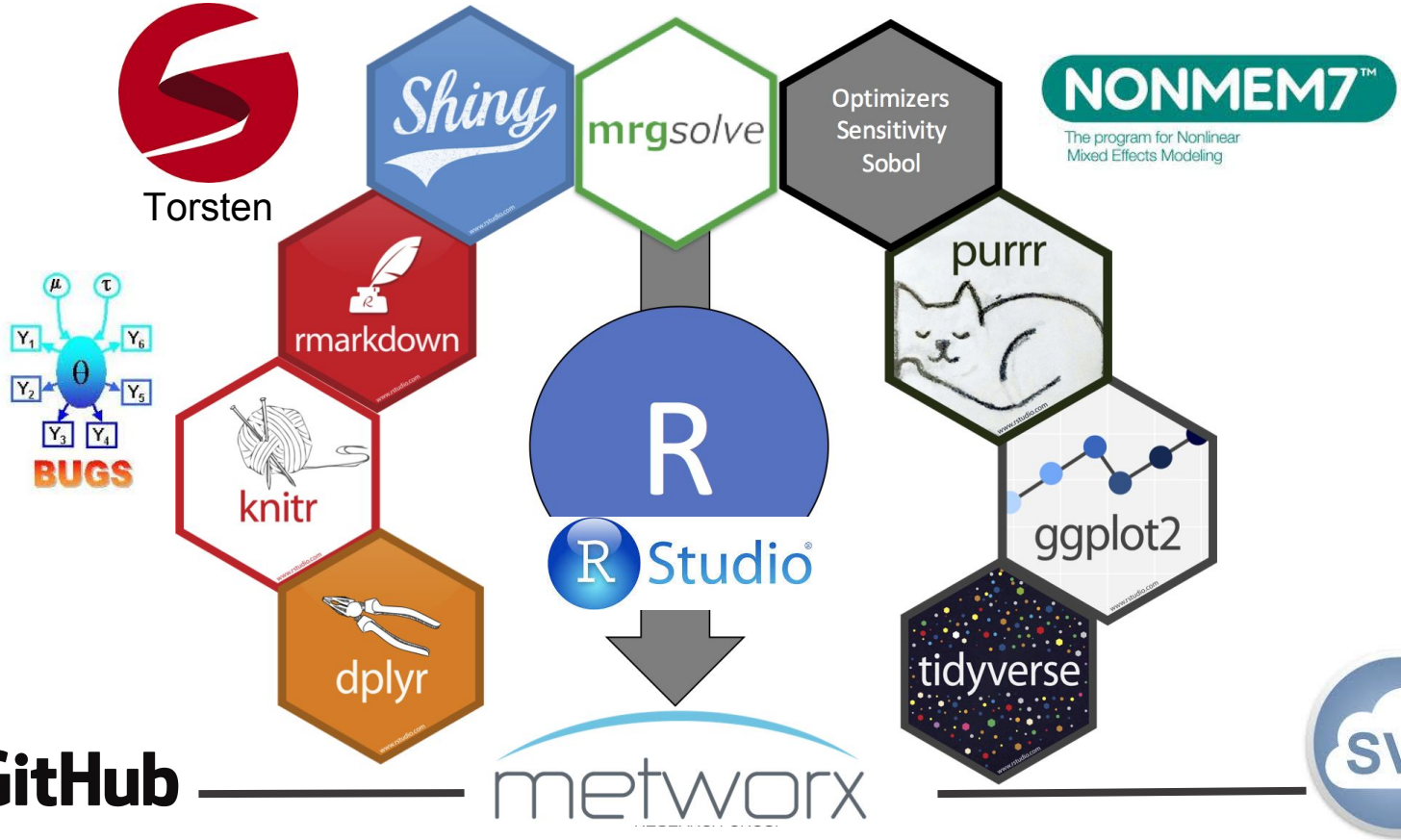
https://github.com/metrumresearchgroup/OpenBoneMin

"Using systems pharmacology model we showed that control on hypercalciuria is feasible with more frequent regimen or a slow release PTH profile at lower systemic exposure than 100 µg QD"



https://wayback.archive-it.org/7993/20170405215559/https://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/EndocrinologicandMetabolicDrugsAdvisoryCommittee/UCM416168.pdf

Computational Infrastructure and Workflow



Since its foundation in 2004, Metrum Research Group has relied on R as the core technology and central framework for all of the company's biomedical modeling and simulation (M&S) service activities, spanning more than 475 projects with 150+ different sponsors. Projects include pharmacokinetic-pharmacodynamic modeling, quantitative systems pharmacology models, simulation-based trial design evaluations, disease progression and patient population modeling, model-based meta analysis of competitor data, model-based comparative effectiveness assessments, and data management activities, etc., all within a regulated environment. Analyses were conducted in R or via other software tools which are managed via R scripts, functions, or packages. Key deliverables of M&S projects are routinely provided as R packages or interactive simulation applications, driven by R (and R Shiny). R has also been an essential component of Metrum's vision for Open Science in biomedical M&S, allowing for accessibility and reproducibility of platform models developed for multiple disease areas.