



# Exposure–Response Modeling: Methods and Practical Implementation (Chapman & Hall/CRC Biostatistics Series)

By Jixian Wang

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## Exposure–Response Modeling: Methods and Practical Implementation (Chapman & Hall/CRC Biostatistics Series) By Jixian Wang

*Discover the Latest Statistical Approaches for Modeling Exposure-Response Relationships*

Written by an applied statistician with extensive practical experience in drug development, **Exposure-Response Modeling: Methods and Practical Implementation** explores a wide range of topics in exposure-response modeling, from traditional pharmacokinetic-pharmacodynamic (PKPD) modeling to other areas in drug development and beyond. It incorporates numerous examples and software programs for implementing novel methods.

The book describes using measurement error models to treat sequential modeling, fitting models with exposure and response driven by complex dynamics, and survival analysis with dynamic exposure history. It also covers Bayesian analysis and model-based Bayesian decision analysis, causal inference to eliminate confounding biases, and exposure-response modeling with response-dependent dose/treatment adjustments (dynamic treatment regimes) for personalized medicine and treatment adaptation.

Many examples illustrate the use of exposure-response modeling in experimental toxicology, clinical pharmacology, epidemiology, and drug safety. Some examples demonstrate how to solve practical problems while others help with understanding concepts and evaluating the performance of new methods. The provided SAS and R codes enable readers to test the approaches in their own scenarios.

Although application oriented, this book also gives a systematic treatment of concepts and methodology. Applied statisticians and modelers can find details on how to implement new approaches. Researchers can find topics for or applications of their work. In addition, students can see how complicated methodology and models are applied to practical situations.

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### Editorial Review

#### Review

"...the book is worth reading as it takes the reader all the way from basic to state-of-the-art exposure-response modeling approaches and challenges. It focuses on detailed mathematical derivations, with many insights based on practical experience. Moreover, many data examples are accompanied by software code ..."  
*?Biometrical Journal*

#### About the Author

**Jixian Wang** is a principal statistician at Celgene International, Switzerland. He worked on drug development for 14 years at GSK and Novartis Pharma and was an academic researcher at Edinburgh University and Dundee University, where he is still an honorary research fellow. His research interests include statistical methodology and its applications to real problems in pharmaceuticals, including exposure-safety, PKPD modeling, treatment/dose selection, health economics, benefit-risk and health technology assessments, and optimal trial design.

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