



PharmPy: a versatile open-source library for pharmacometrics

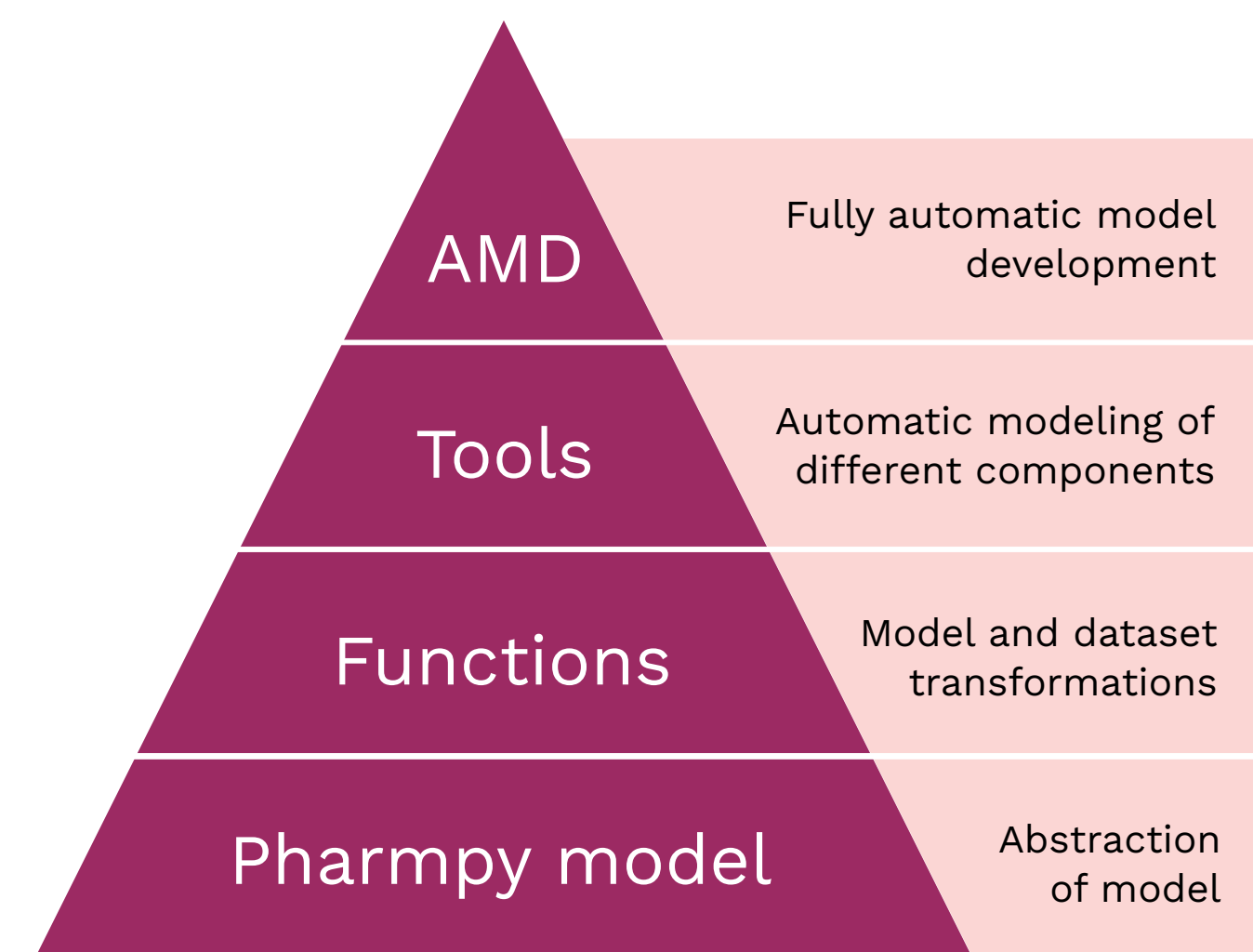
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INTRODUCTION

PharmPy is an open-source software package for pharmacometric modeling intended for pharmacometric researchers and modelers as well as tool developers. It has functionality ranging from reading and manipulating model files and datasets to running advanced tools. The two cornerstones of PharmPy are:

Flexibility in usage

PharmPy has three main layers: the PharmPy model, modeling functions to manipulate a model, and tools which can develop models. Since these are separate layers, you can use whichever suits your use case. PharmPy can be used in Python, in R (via the pharmr package), and from the command line.



Independent of modeling language

The PharmPy model abstraction is independent from the estimation language, allowing transformations and tools to be agnostic about the model type. The general representation of a model facilitates using different software for different scenarios (e.g. estimation and simulation) while using the same PharmPy model object as a base. There is functionality to translate models between languages, and the model code is only updated when necessary.

New in PharmPy 1.7.2

- SAMBA-like algorithms in covariate search
- mBIC as ranking criterion
- New system for running and rerunning tools
- Improved log system
- MPI support (including across nodes) for NONMEM execution

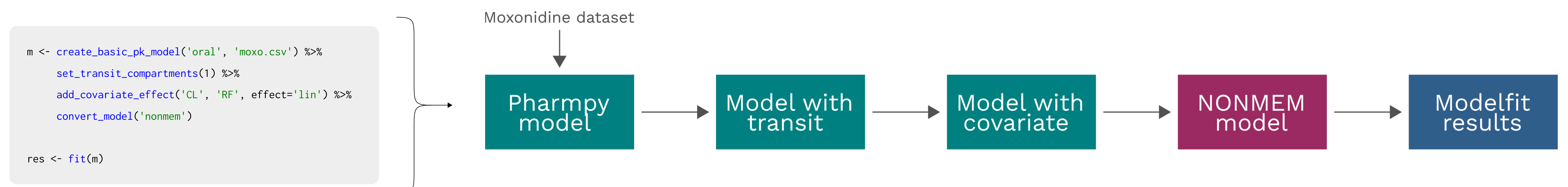
SCRIPT YOUR WORKFLOWS

When a model is parsed from NONMEM, or when a new model is created from scratch in PharmPy, it is represented as a general PharmPy model object. The model is broken down into core components: model statements, parameters, random variables, execution steps, and the dataset, each of which can be manipulated through low level operations and through more

complex functions. PharmPy has many different functions to simplify the pharmacometric model building process. The use cases for these functions range from using only one function for a task that is tedious to perform manually to fully scripting a workflow, including fitting and presenting results.

Modeling software support

- NONMEM (reading, writing, running)
- nlmixr2 (writing, running)
- rxode2 (writing)



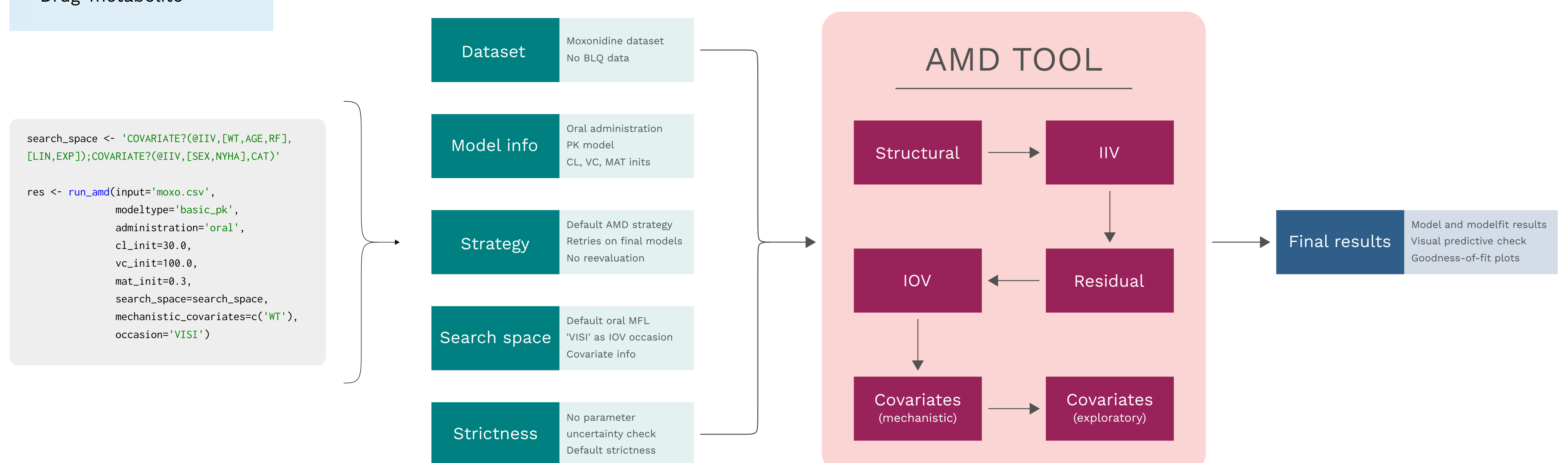
AUTOMATICALLY DEVELOP MODELS

Model type support

- PK
- PKPD
- TMDD
- Drug-metabolite

PharmPy has multiple tools that can automatically develop different aspects of a model, and a fully automatic model development (AMD) tool that develops a model given a dataset. The AMD tool integrates multiple subtools that selects the structural model, the IIV/IOV structure, the RUV model, and covariate effects. These subtools can

also be run standalone. All the tools in AMD produce various results, including reports with model quality plots and tables. PharmPy also has a tool to evaluate estimation methods, solvers, and parameter uncertainty methods.



In collaboration with



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