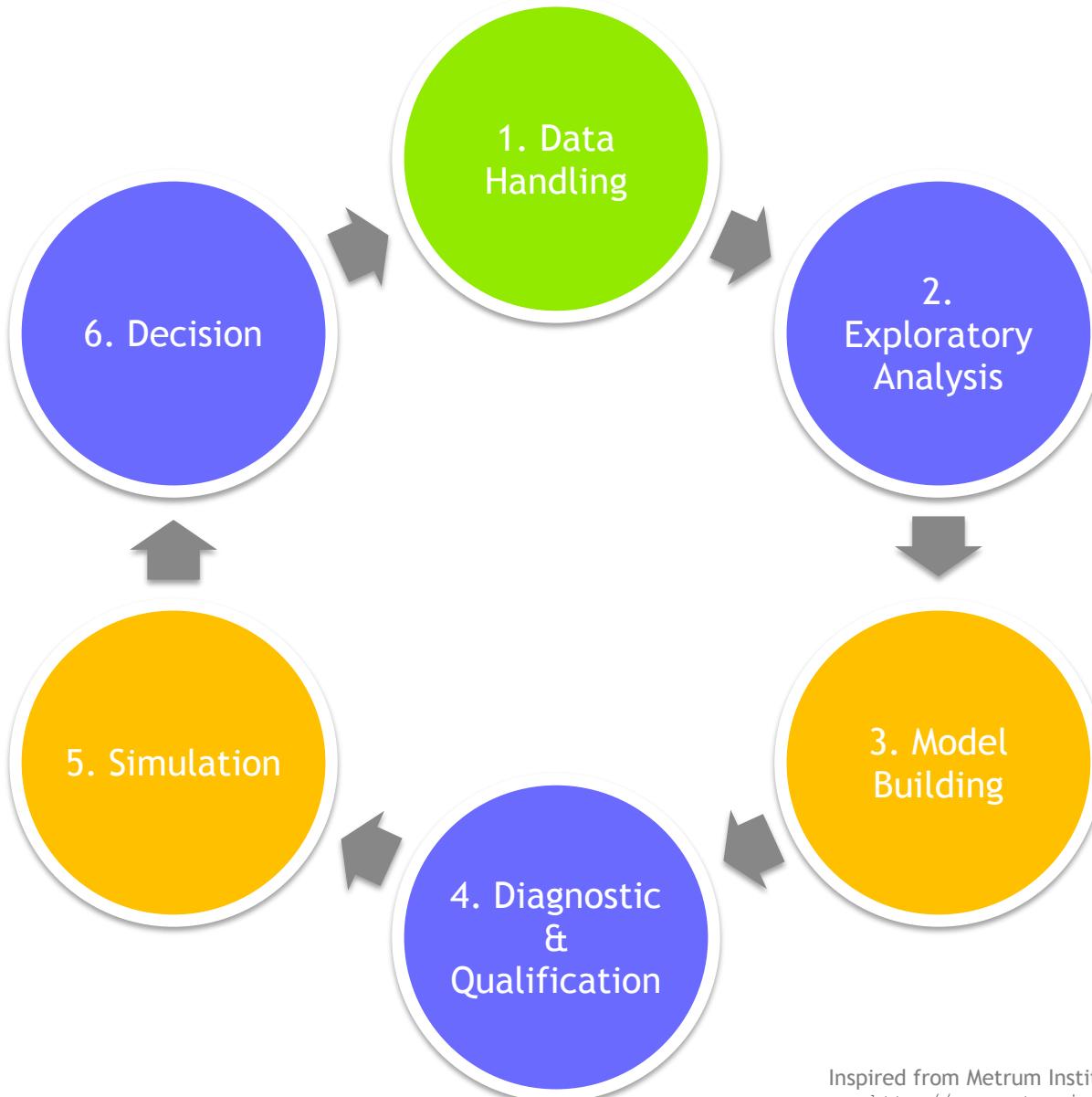


How can Pipeline Pilot help you?

Data Pipelining for PKPD Modelling & Simulation

- Help the modeller by giving access to data from different sources allowing
 - Integration of Data & Applications
 - In-depth Analysis
- Capture & deploy best-practice processes
 - Data Sharing & Search Queries
 - Reporting
 - Process Automation

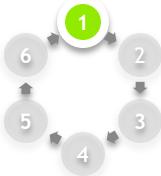
Typical Pharmacometrics Workflow



Inspired from Metrum Institute MItools R Package workflow

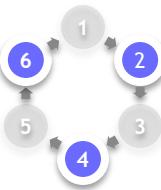
<http://www.metruminstitute.org/publications>

Typical Workflow in Pipeline Pilot



Data Handling

- From/To multiple disparate sources, Databases or Files
- In-House format checking rules, Logging & Archiving



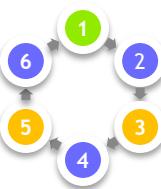
Exploratory Analysis, Diagnostics & Decision Tool

- Advanced Reporting capabilities, Interactive Charts, Forms
- Output formats: HTML, PDF, PowerPoint, Word, Excel, etc.
- Portlets integration, JavaScript, AJAX, Flash, etc.



Model Building & Simulation

- Application Integration: NONMEM, WinBUGS, Monolix, etc.
- Job Explorer & Scheduler



Plus

- Highly Configurable Visual Programming Language
- Integrates R, SAS, MATLAB, Perl, Java, VBScript, etc.

Data Integration



- Databases



1 Corporate Database

- Stored in Files
- Generated on the fly



3



Clinical Data File Reader

Monte Carlo Simulated Data



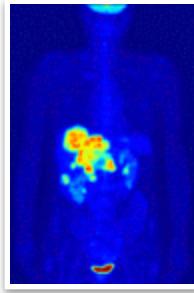
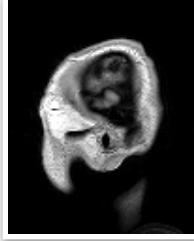
External Clinical Data

5



Image Reader

- Other Data



2



Merge Data



Application X

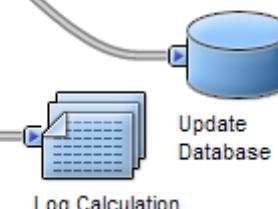
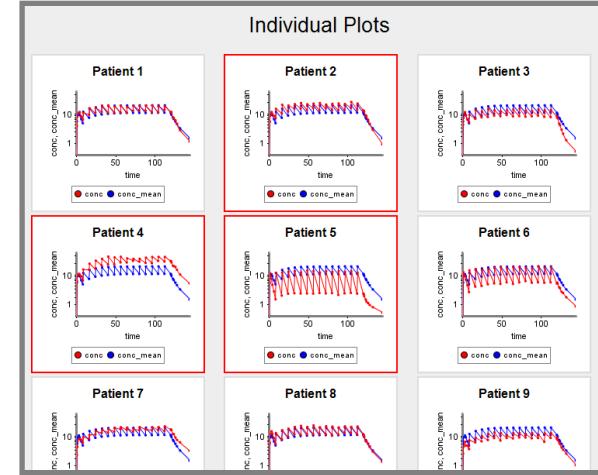
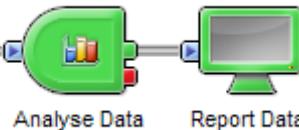
Analyse Data



Report Data

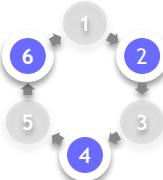
1
2
3
4
5
6

- Data Analysis
- Interactive Report



- Databases
- Log Reports
- Archives
- Flat Files

Visualisation & Reporting

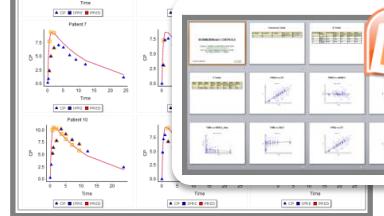
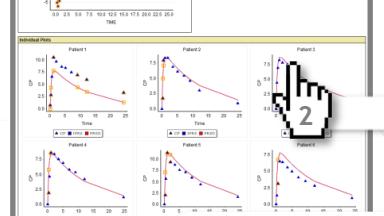
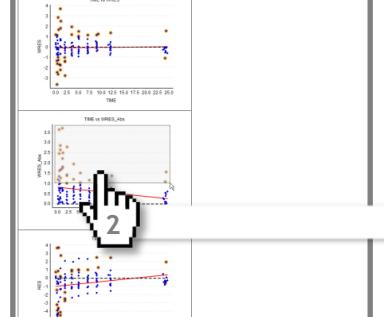
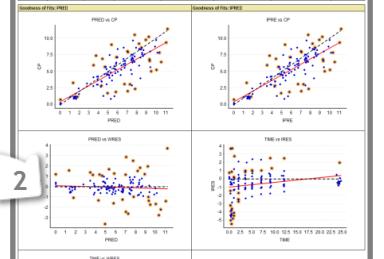


NONMEM Models

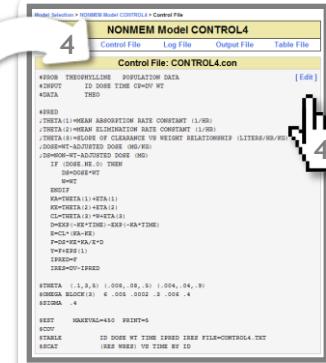
Model Name	Input File	Run Date	Minimization	Minimum of Objective Function	Problem	Q Length	Q Length	I Length	PowerPoint
CONTROLS	DATA	2009 08 15 58:58	MINIMIZATION	8.940	THEOPHYLLINE POPULATION SUBJECT DATA	3	0	1	0
CONTROLS	THEO	2009 08 15 58:58	MINIMIZATION	104.561	THEOPHYLLINE POPULATION DATA	3	3	1	0
CONTROLS-test	THEO	2009 08 15 58:58	RUN		THEOPHYLLINE POPULATION DATA	3	3	1	0
CONTROLS	THEOPP	2009 08 15 58:58	MINIMIZATION	104.561	THEOPHYLLINE POPULATION DATA	3	3	1	0
CONTROLS	THEOPP	2009 08 15 58:58	MINIMIZATION	104.561	THEOPHYLLINE POPULATION DATA	3	3	1	0
CONTROLS-boundary	THEOPP	2009 05 10 15:22:17	MINIMIZATION	104.227	THEOPHYLLINE POPULATION	3	3	1	0

1. Job Explorer

- Run Summary
- Sortable Table
- Select a Run



- 2. Model Report**
- Parameter Estimate
 - Goodness of Fit
 - Individual Plot
 - PowerPoint Version
 - Select a File
 - Select a Patient

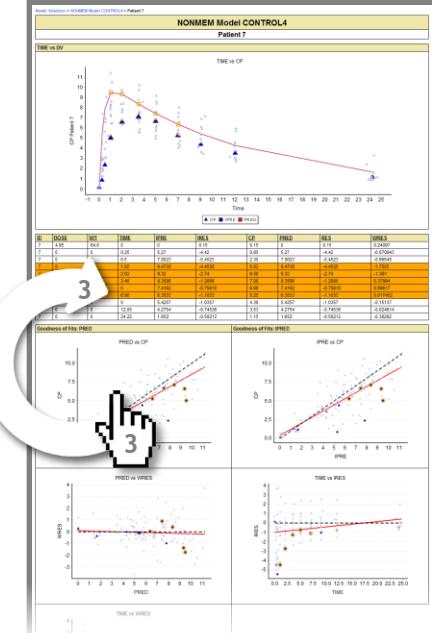


4. File Viewer

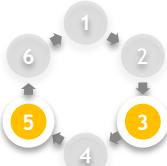
```

NONMEM Model CONTROL4
Control File Log File Output File Table File
Source C:\Program Files\Accelrys\SE\public\clients\accelerys\pharmacokinetics\NONMM Example Data\CONTROL4.com
@PROB THIOPURINE POPULATION DATA
ID DOSE TIME CMVW VT
DATA THD
MEAN
THETA(1)=MEAN ABSORPTION RATE CONSTANT (1/H)
THETA(2)=MEAN ELIMINATION RATE CONSTANT (1/H)
THETA(3)=LOG OF CLEARANCE VS WEIGHT RELATIONSHIP (LITERS/HKG)
THETA(4)=LOG OF CL MAXIMUM (LITERS/H)
D=DOSE*WT/ADJUSTED DOSE (MG)
D=D*THETA(4)*ADJUSTED DOSE (MG)
IF D>0 THEN
  DOSE=D*WT
  ELSE
    DOSE=0
  ENDIF
K=A*THETA(1)+THETA(2)
P=K*(1+THETA(3)*WT)
C=THETA(3)*WT*THETA(1)
D=EXP(-K*TME)-EXP(-KA*TME)
E=C*(1+KA*WT)
F=D-E*VRES*X2*D
G=F*VRES*X2*D
H=V*EPS(1)
I=H*D
J=I*D
K=EXP(-DT*IPRED)
L=THETA(1), (1,3,5) (.008, .08, .5) (.004, .04, .9)
M=THETA(2) 6 .005 .0002 .3 .006 .4
N=OMA .4
O=BEST MAXVAL=450 PRINT=5
P=CV
Q=STABLE
R=TABLE
ID DOSE WT TIME IPRED IRES VRES BY ID
S=GEEV
T=GEEV
U=GEEV
V=GEEV
W=GEEV
X=GEEV
Y=GEEV
Z=GEEV
IRES=DT*IPRED
OMA=OMA
END
K=A*THETA(1)+THETA(2)
P=K*(1+THETA(3)*WT)
C=THETA(3)*WT*THETA(1)
D=EXP(-K*TME)-EXP(-KA*TME)
E=C*(1+KA*WT)
F=D-E*VRES*X2*D
G=F*VRES*X2*D
H=V*EPS(1)
I=H*D
J=I*D
K=EXP(-DT*IPRED)
L=THETA(1), (1,3,5) (.008, .08, .5) (.004, .04, .9)
M=THETA(2) 6 .005 .0002 .3 .006 .4
N=OMA .4
O=BEST MAXVAL=450 PRINT=5
P=CV
Q=STABLE
R=TABLE
ID DOSE WT TIME IPRED IRES VRES BY ID
S=GEEV
T=GEEV
U=GEEV
V=GEEV
W=GEEV
X=GEEV
Y=GEEV
Z=GEEV
IRES=DT*IPRED
OMA=OMA
END
      
```

5. File Editor

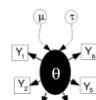


- 3. Patient Report**
- Individual Plot
 - Goodness of Fit
 - Patient Data Table
 - Select a Patient



Modelling & Simulation

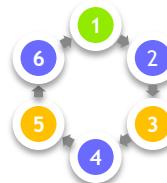
- ▶ NONMEM
- ▶ PsN
- Xpose
- Monolix
- ▶ WinNonLin
- simCYP
- ▶ WinBUGS
- ▶ MC Sim



✓ Released

▶ Prototype

● To be done



Plus

- ✓ Command Line



- ✓ ORACLE



- ✓ R



- ✓ MATLAB



- ✓ SAS



- ✓ Perl



- ✓ Java



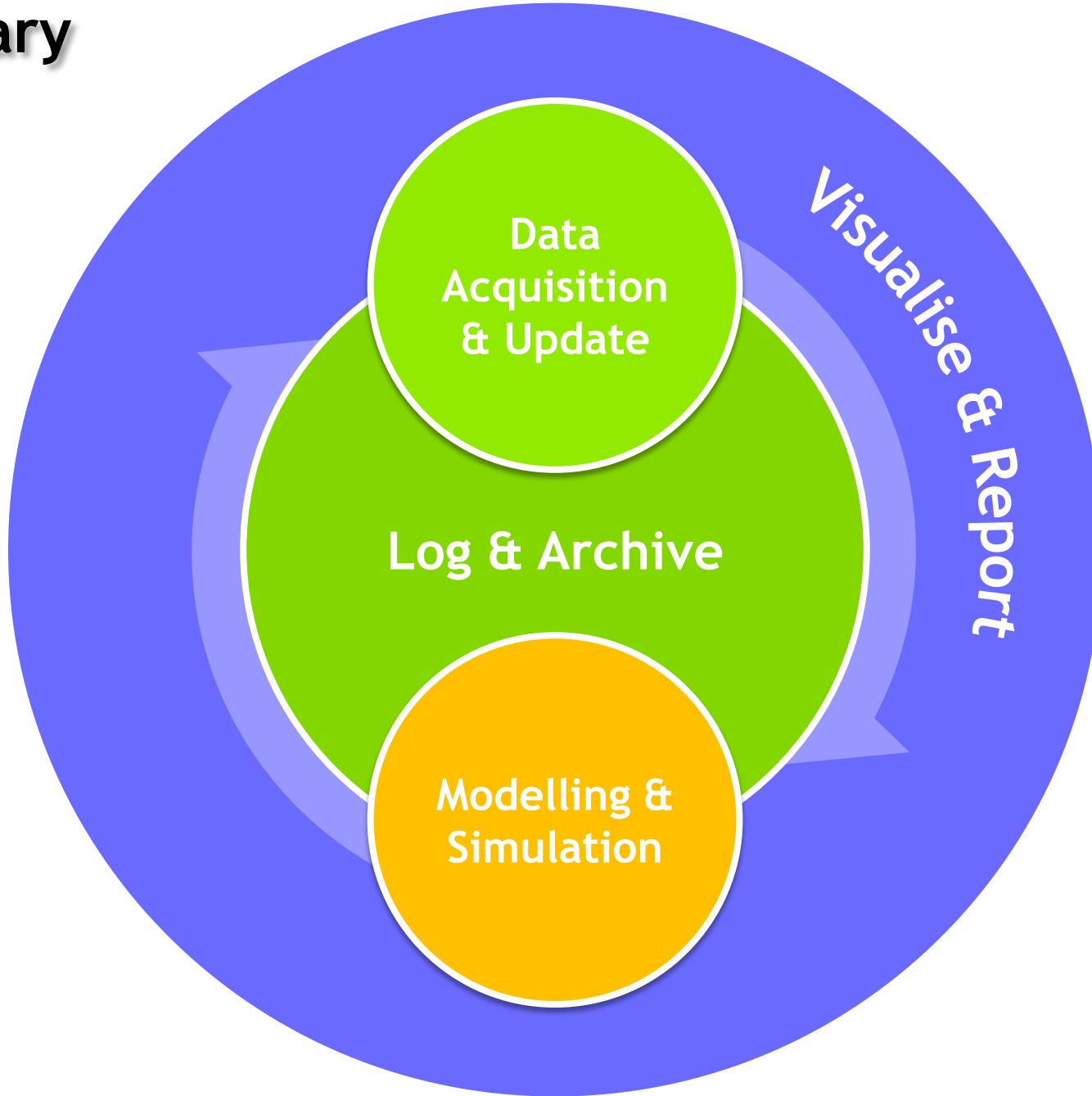
- ✓ Python



- ✓ VBScript



Summary



- Chemistry
 - Chemistry
 - ADMET
 - Cheminformatics
- Biology
 - Sequence Analysis
 - Gene Expression
 - Mass Spectrometry for Proteomics
- Laboratory
 - Plate Data Analytics
 - Analytical Instrumentation
- Life science modeling & simulation
 - Catalyst (Pharmacophore)
 - CHARMM (Simulations)
- Materials modeling & simulation
 - Materials
 - Polymer Properties (Synthia)
- Analysis and Statistics
 - Modeling
 - Advanced Modeling
 - R-Statistics
- Imaging
 - Imaging
 - Advanced Imaging
- Document Search and Analysis
 - Text Analytics
 - Chemical Text Mining
- Reporting & Visualization
 - Reporting
- Database & Application Integration
 - Integration