

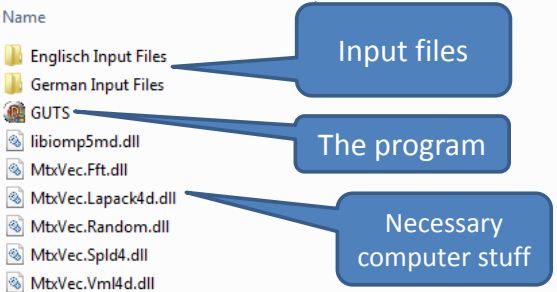
# USER MANUAL GUTSEXE

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## INSTALLATION:

1. Extract the zip file to a folder you like
2. You should see the following files:

Name	Änderungsdatum	Typ	Größe
Englisch Input Files	12.10.2012 14:50	Dateiordner	
German Input Files	12.10.2012 14:51	Dateiordner	
GUTS	12.10.2012 14:14	Anwendung	3.438 KB
libiomp5md.dll	31.01.2012 11:10	Anwendungserwe...	799 KB
MtxVec.Fft.dll	15.03.2012 12:07	Anwendungserwe...	23.718 KB
MtxVec.Lapack4d.dll	15.03.2012 12:07	Anwendungserwe...	14.721 KB
MtxVec.Random.dll	15.03.2012 12:07	Anwendungserwe...	10.279 KB
MtxVec.Spld4.dll	16.03.2012 17:34	Anwendungserwe...	4.927 KB
MtxVec.Vml4d.dll	16.03.2012 17:34	Anwendungserwe...	2.532 KB
tpmath.dll	12.03.2010 18:19	Anwendungserwe...	282 KB



3. Please make sure that all \*.dll files are located in the same directory as the executable GUTS.exe program.
4. There are different input files for different languages. This is only important if you use Microsoft EXCEL to open and edit the input files. GUTS can always read both kind of files

## THE INPUT FILES

GUTS<sub>ex</sub> needs exposure scenarios to simulate survival. For calibration exposure scenario and related survival data are needed.

This exposure and survival data can be read into GUTS<sub>ex</sub> by comma separated text files (CSV). Comma separated text files can also be read by any spread sheet calculation program like Microsoft EXCEL.

Unfortunately Microsoft decided to ignore worldwide standard for EXCEL. So in the German version EXCEL uses comma as decimal separator and semicolons to separate columns in the so called comma separated text files.... No comments to that ;-)

GUTS<sub>ex</sub> always read in files in which the decimal separator is fullstop and the columns are separated by comma.

If you successfully open one of the sheets you see and can edit the following:

1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Species	Chaoborus													
2	Age [d]														
3	Development stage														
4	Size [mm]														
5	Weight [mg]														
6	Media														
7	Temperature [°C]														
8	Reference	Modellink													
9	Firstorderkin	1													
10	kin	1													
11	kout	1	1												
12	k21	0	0	0											
13	k22	0	0	0											
14	Lipid [%wetw]	0	0	0											
15	Calculate Co	0													
16	DT50 [h-1]	0													
17	Unit of concng/l														
18	Number of C	12													
19															
20	Zeitpunkt	Time [h]	Time [d]	Concentration	Survived [%]	Concentration	Survived [%]	Concentration	Survived [%]	Concentration	Survived [%]	Concentration	Survived [%]	Concentration	Survived [%]
21	1	0	0	0	10	0	10	0,27936356	10	0,27936356	10	0,93122222	10	0,93668959	10
22	2	48	2	0	10	0	10	0,27936356	10	0,27936356	10	0,93122222	10	0,93668959	6
23	3	72	3	0	9	0	10	0,27936356	10	0,27936356	10	0,93122222	6	0,93668959	6
24	4	6	4	0	9	0	10	0,27936356	10	0,27936356	10	0,93122222	6	0,93668959	6
25															

Some Information  
Not necessary for the model, but might help the user

Toxicokinetic parameters, only necessary if scaled damage is used as dose metrics

Possibility for lipid normalization

Possibility for calculating dissipation

Number of datasets

Time

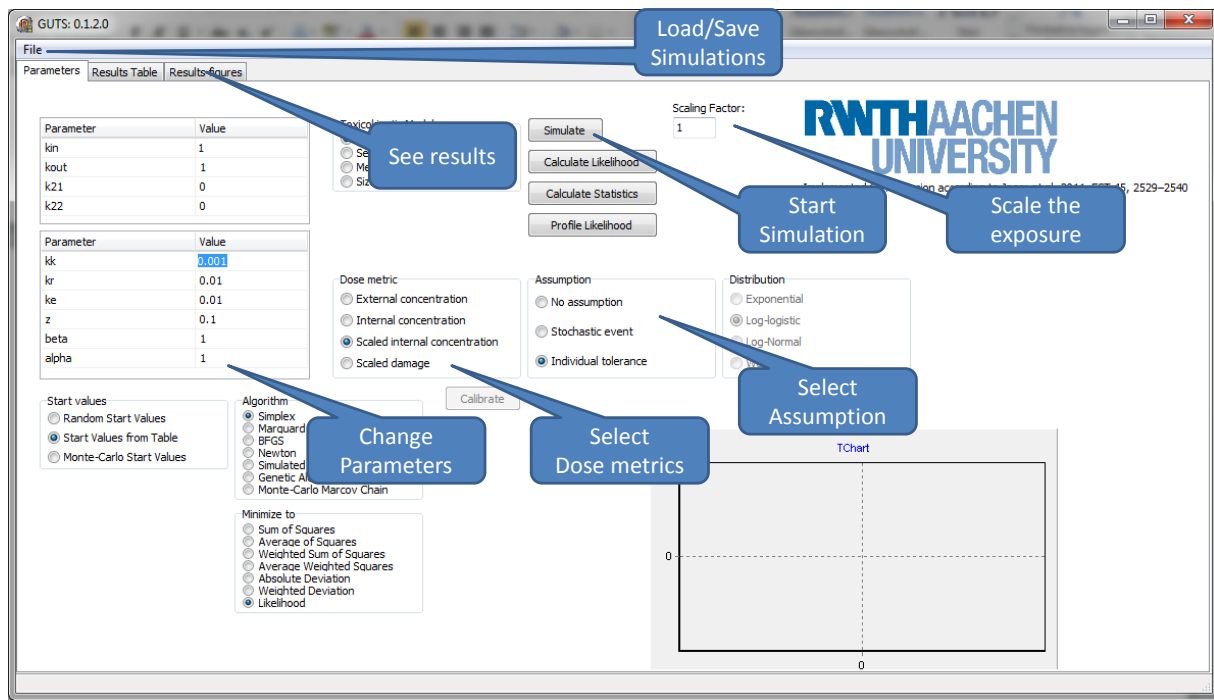
Concentration

Surviving animals

## RUNNING GUTSEXE

1. Open the executable exe GUTS
2. FILE > LOAD DATASET
3. Select one of the datasets
4. Press SIMULATE
5. Look RESULT FIGURES
6. Press on one of the arrows

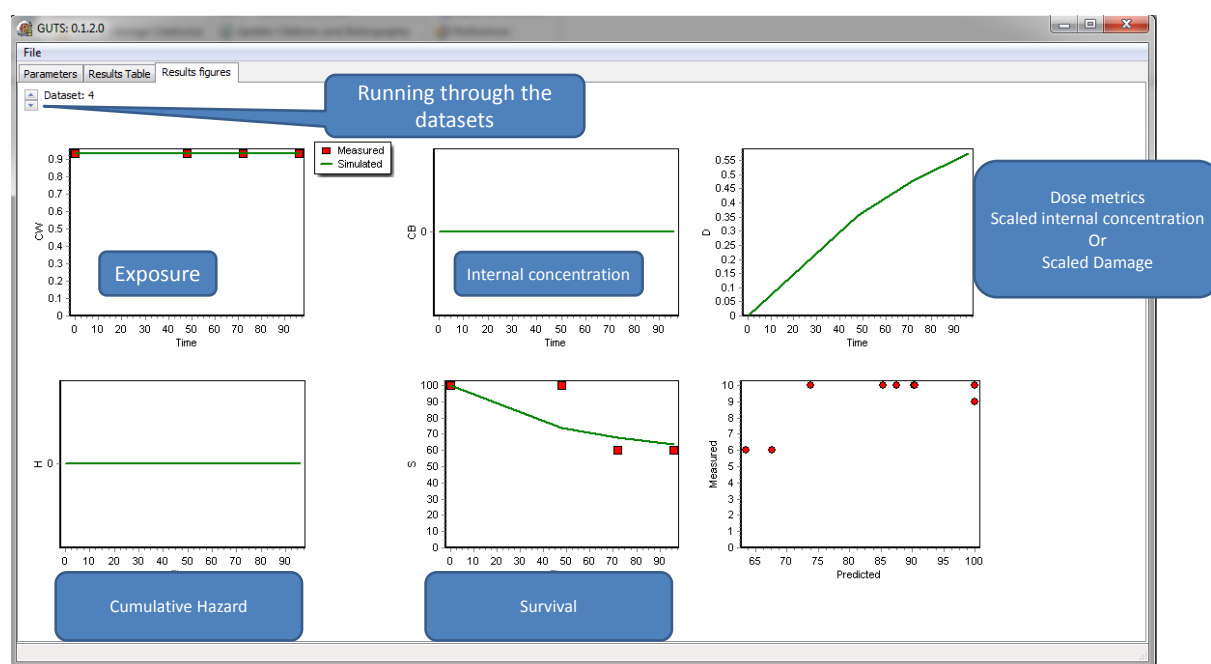
## THE GUI:



You can load input data or save simulation results.

By pressing Simulation the model calculates survival depending on the parameters give in the sheet, the selected dose metrics and the selected assumption. For further information see[1]. Be aware for stochastic death  $kk$  (killing rate),  $z$  (threshold) is needed whereas for individual tolerance  $\alpha$  and  $\beta$  are necessary. If Dose metrics s scaled internal concentration  $ke$  (dominate rate constant) is needed for scaled damage  $kr$  (recovery rate) as well as toxicokinetic information (upper table). The toxicokinetic model can be a first or second order kinetic or a pseudo second order kinetic in means of metabolism.

After Simulation is finished the results can be seen in the RESULTS FIGURES.



If you do not see a dataset press one of the arrows!

By pressing the arrows you can run through all datasets simulated. For each dataset (exposure + survival) you see the exposure, internal concentration, dose metrics (either scaled internal concentration or scaled damage), cumulative hazard and the survival.

All diagrams can be copied by clicking on it. Afterwards you can paste them into Word, Powerpoint whatever.

[1] Jager T, Albert C, Preuss TG, Ashauer R. 2011. General Unified Threshold Model of Survival - a Toxicokinetic-Toxicodynamic Framework for Ecotoxicology. *Environmental Science & Technology* 45:2529-2540.