

# VIVO Manager

## Management of preclinical oncology animal studies

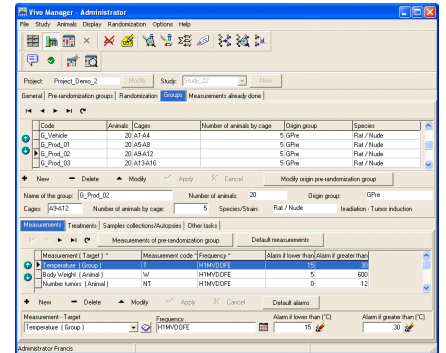
Designed for oncology research, VIVO Manager gives you total control over your animal studies, from animal reception to result analysis, with study definition, task management and electronic data collection.

### Optimize productivity and data quality

A fully integrated software suite

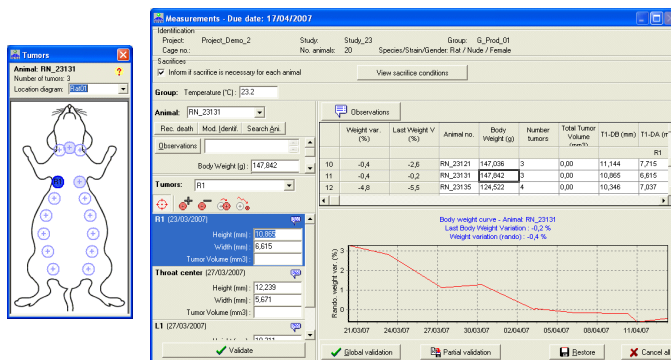
VIVO Manager optimizes all aspects of your research animal projects and associated studies:

- flexible project and study definition
- task management and tracking
- automated randomization
- data collection and database storage
- data analysis
- animal husbandry management
- controlled access to data and software functions
- action tracking



### Optimized study execution and data collection

Accurate, efficient and even hands-free data collection using chip readers for animal identification, electronic data collection from balances and calipers, and animal diagrams with individual tumor locations. Measurements and other tasks are scheduled and tracked to guarantee the quality of the study data.

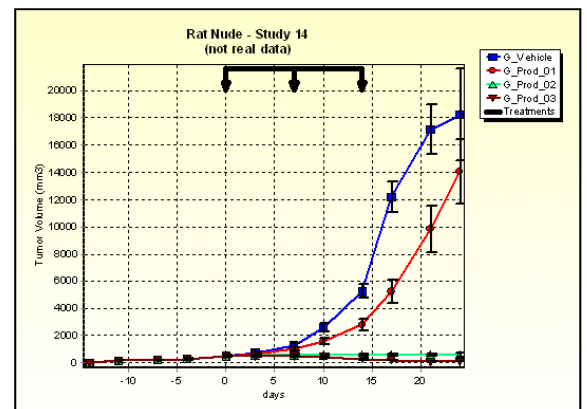


### Flexible definition and rigorous control

Freely define any type of treatment, tumor induction, measurement, task periodicity and operator in the different study phases. Use the automated randomization to allocate animals to user-defined groups. Control the progress of the studies. Search through the database where all study information, task execution details, and collected data are preserved.

### Immediate results and graphs

Analyze and graph data immediately, even from studies in progress.



### Company-wide access to all data

VIVO Manager's relational SQL database gives authorized users immediate access to any data: study definitions, measurements, treatments and other tasks, data analysis, animal husbandry management.



VIVO Manager has been developed in collaboration between Biosystèmes and Oncodesign.

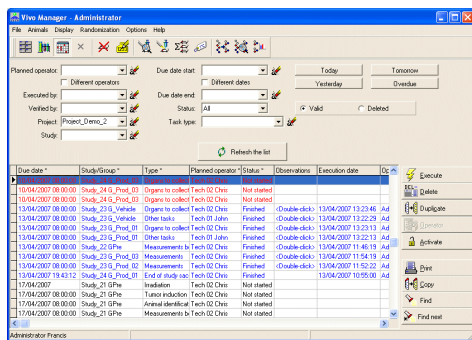
Biosystèmes has many years of experience in successful development, worldwide marketing, and client support for scientific software.

Oncodesign uses VIVO Manager in its unique technological platform after having contributed its expertise in animal oncology studies to allow the design of a software package that optimizes productivity and data integrity, allows rigorous study control, but also retains the flexibility needed by scientists for efficient research.

## Flexible study definition

The easy study definition includes:

- Associated protocol document
- Any type of measurement for any study phase with target definition: group, animal, tumor. Each measurement can have a 'normal' range in order to get alarms when inconsistent measurements are entered.
- User-defined formulas for any parameter, for example tumor volume
- Irradiations and dose
- Tumor inductions with method and target organ. Can be chemical (agent, fixed or body-weight dependent dose), cells (cell line, cell count, volume) or fragment implants (cell line, tumor fragment weight,...)
- Pre-randomization and treatment groups
- Criteria for automated randomization to allocate animals to groups
- Treatments with drug, concentration, administration route, fixed or body-weight dependent dose
- Sample collections (organ, quantity, collection mode) and autopsies (organ)
- Values to trigger alerts when groups are ready for randomization, or when animals reach sacrifice conditions
- All the tasks can be defined even at the group level, are allocated to an operator and have a user-defined periodicity or can be event-driven (after identification, randomization, death, sacrifice, study end).



## Task management

- The scheduler displays the operator's daily tasks at login.
- Task filtering (by operator, due date range, overdue, task type, status...) for task management and control.
- Tracking of execution date and operator
- Event-triggered tasks automatically added to the task list: measurements, sacrifices, data collection, autopsies

- For non-lethal sample collection, displays history of last collected animals.
- Record/view observations for any task

## Measurements

Measurements are part of the tasks and can be automated: chip reader to identify animals, manual or device-driven data collection from electronic balance and caliper for hands-free animal weighing and tumor measurements.

Of course data can be entered manually. User-customizable animal diagrams with tumor locations allow to record individual tumor evolutions. All measurements associated with optional comments. Authorized users can request immediate history curve after measurement validation. Alarm if measurement outside 'normal' range, and alert if conditions reached for randomization or animal sacrifice.

## Animal management

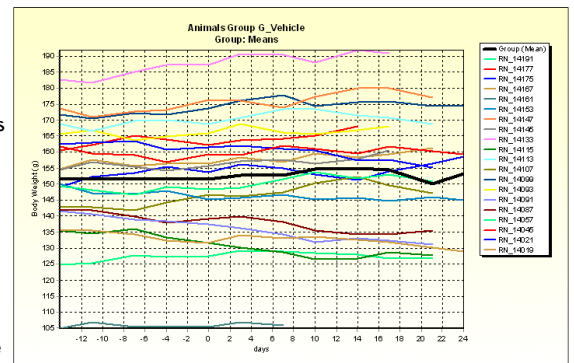
- Animal receptions, weight verification
- Allocation to cages,
- Allocation to studies
- Display reserved/available animals
- Tracking of animal receptions, suppliers, mortality
- Animal husbandry reports
- Animal identification

## Database

- All data are stored in the relational SQL database: user-customized dictionaries / nomenclatures, study definition, task status, measurements,...
- Roles assigned to users control access to data and software functions.
- Task tracking: planned tasks, measurements, deaths, sacrifices and subsequent data collections and autopsies,
- The query tool gives access any kind of data.

## Data analyses

- Control / analysis of the randomization by ANOVA
- Raw data lists
- Descriptive statistics: mean, minimum, maximum, range, standard-deviation, confidence interval, median, quartiles
- Animal graphs: plot evolution of any measurement animal per animal; group statistics (any descriptive statistic) can also be displayed on the plots



- Group graphs: plot evolution of any measurement for the animal groups; any descriptive statistic can be displayed
- Group comparisons on any measurement by ANOVA with choice of mean comparison tests: L.S.D., Bonferroni, Scheffé, Tukey, Duncan, Newman-Keuls or Dunnett, at the chosen test level.

Source of variation	D.F.	F.S.	M.S.E	comp.F	Proba
Groups	3	1720672690.3	573557563.45	286.9513	0.0000
Residuals	70	139915843.45	1998797.764		
Total	73	1860588533.8			

Bonferroni test at 5%  
Levels with the same letter show no significant difference

Comparison	Mode	Size	Mean	Groups
G_Vehicle	18	12183.02	B	
G_Prod_01	18	5260.96	C	
G_Prod_02	19	5600.00	A	
G_Prod_03	19	189.12	A	

- Survival graphs and analyses: Kaplan-Meier
- Relative tumor volume, tumor doubling time, tumor growth delay, tumor growth inhibition
- Analyses and graphs saved in reports
- Raw data exportation



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