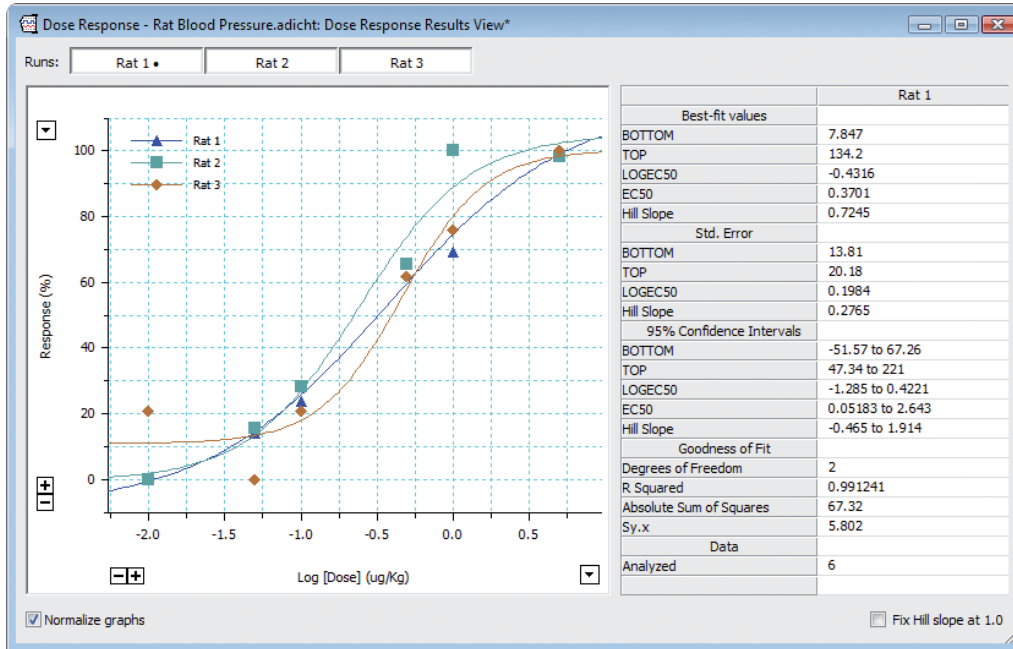


# Pharmacological Data Acquisition and Analysis

## Dose Response Module for Chart Software and PowerLab



Dose Response Module Results View showing fitted response curves to increasing doses of norepinephrine in rat blood pressure recordings (see recording at bottom). Fitting parameters for a selected curve are shown on the right.

ADInstruments PowerLab® data acquisition systems are used in many types of dose response studies. They include muscle contraction, enzyme activity, hormone secretion, blood pressure, heart rate and membrane potential, in response to chemical, electrical or physical agents.

Chart™ software, supplied with the PowerLab acquisition unit, controls the amplification, filtering and sampling of the signals detected by the transducers and/or electrodes. In addition to displaying and recording the data on your computer, Chart provides numerous calculation and analysis features.

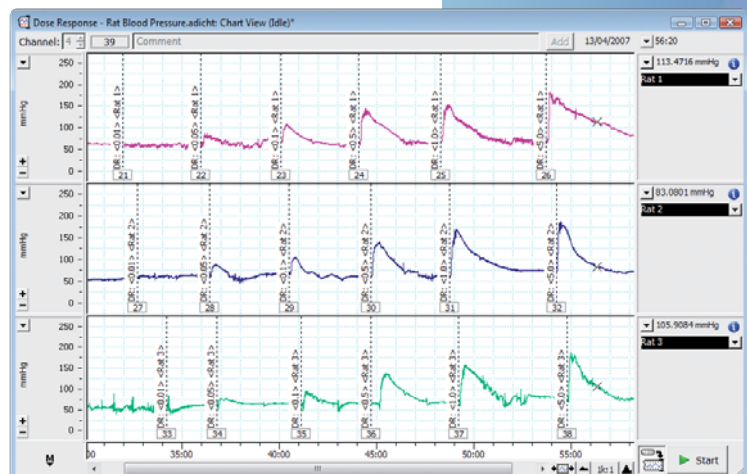
The Dose Response Module provides additional features to accelerate analysis. It identifies response markers in the Chart recording and uses the selected data to generate dose response curves and calculated values such as EC50 and Hill slopes.

Using the Dose Response Module the analysis can be automated either offline, with any previously recorded data, or in real time as data is being acquired.

### Features & Benefits

- Complete data acquisition and analysis systems for *in vivo* and *in vitro* dose response applications
- Agonist/antagonist studies
- Online and offline analysis
- Manual or automatic dose response curve calculation modes
- Display of single or multiple response curves
- Example studies:
  - muscle contraction
  - enzyme activity
  - hormone secretion
  - blood pressure
  - heart rate
  - membrane potential

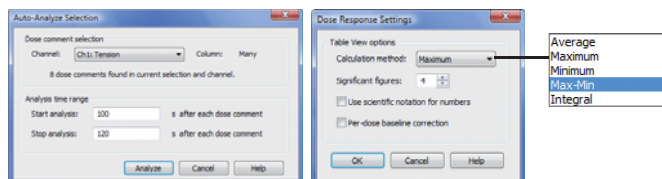
Below: Recording of rat aortic blood pressure. The agonist injection points were marked during recording. Data were digitally filtered to remove the individual beats to show only the average pressure per beat.



# Chart and Dose Response Module

## Detection and Settings

The Convert Comments dialog identifies comments corresponding to changes in doses and converts these comments to dose comments. In the Dose Response Settings dialog, these dose comments are used to calculate either the average, maximum, minimum, amplitude or integral from a selection of the response. The analysis can be automated in the Auto-Analyze Selection dialog.



Auto-Analyze Selection dialog with Settings dialog and calculation options (above)

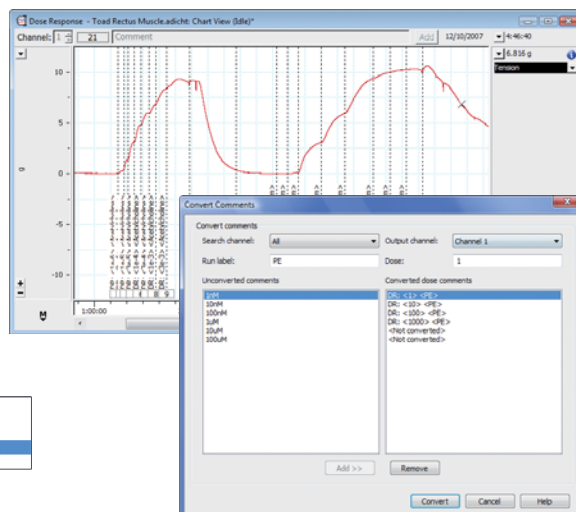


Chart View with Dose Comments (top) and Convert Comments dialog (inset)

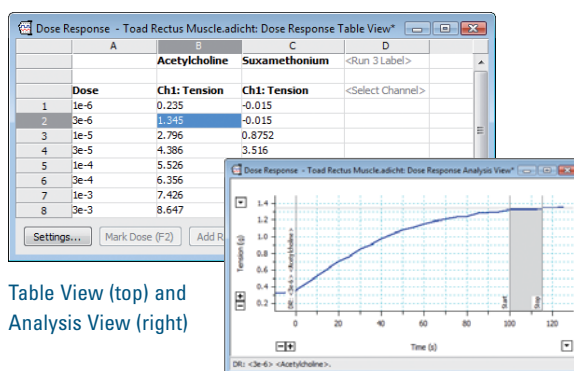


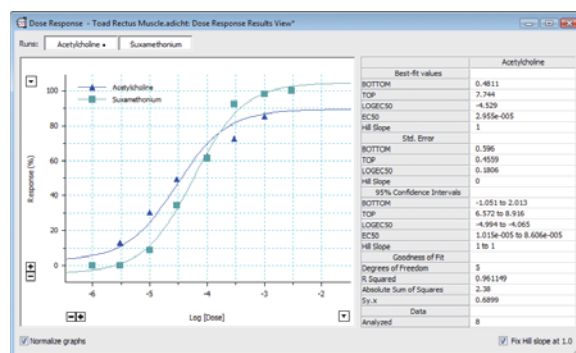
Table View (top) and Analysis View (right)

## Table View and Analysis View

Results from any analyses are tabulated in the Dose Response Table View. The value of each response in the Table View is linked with the corresponding display in the Dose Response Analysis View and Chart View. The results change automatically when different analysis selections are made.

## Results View

The Dose Response Results View displays the plotted dose response curves and calculated parameters such as EC50 and Hill slopes with their respective standard errors. The Results View also allows options for normalizing the curves and changing the units on the x-axis.



Results View with calculated parameters

## Chart Pro

Additional modules are available separately or as a complete software package in Chart Pro\*. The Chart Pro Upgrade is an economical way of purchasing the entire suite of ADInstruments research software including:

**Dose Response** – generate dose response curves, EC50 values and additional parameters

**DMT Normalization** – calculates and standardizes vessel optimal pretension conditions using the wire myograph

**Blood Pressure** – automatically detects, analyzes and reports parameters from arterial or ventricular pressure recordings

**ECG Analysis** – detects and reports the onset, amplitude and interval times of PQRST from human and animal ECG signals

**Heart Rate Variability** – displays and analyzes variation in the interval between heartbeats in human and animal ECG

**Metabolic** – provides real-time measurements of parameters such as: VCO<sub>2</sub>/min, VO<sub>2</sub>/min, VE/min and RER

**Spike Histogram** – detects, discriminates and analyzes extracellular spike activity generating a range of plots and statistics

**Peak Analysis** – automatic detection and analysis of multiple, but not overlapping, signal waveforms from recordings

**Cardiac Output** – calculates cardiac output from a Chart recording of a thermodilution curve measured in animals

**Quicktime Capture** – allows the synchronized recording and playback of a QuickTime movie and Chart data file

\*Chart Pro does not include GLP Client and GLP Server software.

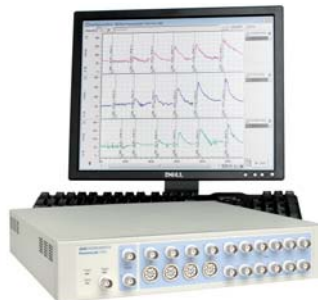
# Customized or Preconfigured Solutions

## ADInstruments Research Systems

We supply systems specifically configured for your needs. Whether it's one of our off-the-shelf research systems or a completely customized package, the state-of-the-art equipment and software will fast track your research. Below are select items in the ADInstruments product range that can be used for *in vivo* and *in vitro* dose response applications. For a complete range and additional product information please visit our website: [www.ADInstruments.com](http://www.ADInstruments.com)

## PowerLab Data Acquisition Systems

PowerLab data acquisition systems are supplied with Chart software and offer 4, 8 and 16 recording channels, variable sampling speeds of up to 200 kHz per channel, online and offline computations and powerful display and analysis features. They are used in a wide range of physiological, pharmacological and neurophysiological research applications.

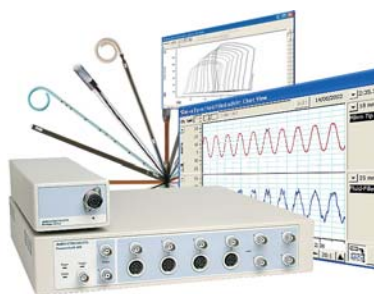


## Organ Bath Systems

We provide organ baths in the classical-modular or "all-in-one" compact styles. Software-controlled bridge amplifiers, isometric and isotonic transducers, stimulators and stimulating electrodes are available. Bridge amplifiers interface with PowerLab and Chart to record, display and analyze the data.

## Wire Myograph Systems

For *in vitro* studies of smooth muscle function in small (> 60  $\mu\text{m}$ ) tubular tissues such as arteries, veins, bronchi and ureter, wire myographs and PowerLab systems are ideal. The Normalization Module for Chart provides an easy method for the calculation of optimal pretension conditions for each tissue sample.



## Cardiovascular Pressure Systems

ADInstruments systems for cardiovascular pressure and pressure-volume recordings feature state-of-the-art Mikro-Tip catheters. Their miniature size allows them to be positioned at the source of the pressure signal to eliminate signal artifacts in signals requiring fast response times. Mikro-Tip catheters interface with PowerLab systems via direct connection to bridge amplifiers.

## Working Heart/Langendorff Systems

For isolated heart experiments we provide complete systems featuring glassware, data acquisition equipment, amplifiers, transducers and accessories. Specialized glassware for Working and Langendorff Heart applications is available. Chart software provides powerful online and offline calculation functions, display and data extraction features for fast analysis.



# Ordering Information

## PowerLab Data Acquisition Systems

ML866/P PowerLab 4/30

ML870/P PowerLab 8/30

ML880/P PowerLab 16/30

/P PowerLab units are supplied with Chart, Scope and all the Chart Modules as listed below in MLS250 Chart Pro

## Compact Organ Bath Systems

ML870B5/C 4 Chamber System

ML870B6/C 8 Chamber System

ML880B7/C 16 Chamber System

Systems include a PowerLab, Bridge Amp, Force Transducers and Multi-Chamber Organ Bath

## Tissue/Organ Bath Systems

ML870B60/C-V Radnoti 4 Chamber Tissue-Organ Bath System

ML870B61/C-V Radnoti 8 Chamber Tissue-Organ Bath System

ML880B62/C-V Radnoti 16 Chamber Tissue-Organ Bath System

Systems include a PowerLab, Bridge Amps, Force Transducers, Multi-Chamber Organ Bath, Thermo Bath/Circulator

## Wire Myograph Systems

ML870B22 Dual Wire Myograph System

ML870B24 Multi-Chamber Wire Myograph System

Systems include a PowerLab and a DMT Wire Myograph

## Pressure and Pressure Volume Systems

ML870B30 Mouse Mikro-Tip BP System

ML870B31 Rat Mikro-Tip BP System

ML880B46 Pressure-Volume Foundation System\*

Systems include a PowerLab, Bridge Amp, Mikro Tip catheters, cables and other equipment.

\*Pressure-Volume catheters are to be purchased separately. For more information or assistance please contact your nearest ADInstruments representative.

## Working Heart Systems

ML870B55-V Radnoti Working Heart System for Mice

ML870B50/X-V Radnoti Working Heart System for Rats/Rabbits

Systems include a PowerLab, Bridge Amps, Pressure Transducers, T-type Pod, Thermocouple Probe, Animal Bio Amp, Spring Clip Electrodes and Radnoti Working Heart

## Langendorff System

ML870B2 Langendorff System

System includes a PowerLab, Langendorff apparatus, with Thermostat controller, Peristaltic Pump, STH Pump Controller, Bridge Amps, Physiological Pressure Transducers, Animal Bio Amp and accessories

## Software

MLS023 Chart

MLS330 GLP Client and MLS335 GLP Server

MLS250 Chart Pro (Includes the modules listed below. Modules are also available for individual purchase.)

MLS390 Dose Response Module	(Win)	MLS240 Metabolic Module	(Win and Mac)
MLS065 DMT Normalization Module	(Win and Mac)	MLS062 Spike Histogram Module	(Win and Mac)
MLS370 Blood Pressure Module	(Win)	MLS380 Peak Analysis Module	(Win)
MLS360 ECG Analysis Module	(Win)	MLS340 Cardiac Output Module	(Win)
MLS310 Heart Rate Variability Module	(Win and Mac)	MLS320 Quicktime Capture Module	(Mac)

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PowerLab systems and signal conditioners meet the European EMC directive. ADInstruments signal conditioners for human use are approved to the IEC60601-1 patient safety standard and meet the CSA C22.2 No. 601.1-M90 and UL Std No. 2601-1 safety of medical electrical equipment standards.



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ISO 9001:2000 Certified Quality Management System

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