

AN EFFICIENT AND ADVANCED ALTERNATIVE TO TRADITIONAL INCAPACITANCE TESTS FOR ASSESSING PAIN SENSITIVITY



## DWB: Advanced Dynamic Weight Bearing 2.0

### INSTRUMENT OVERVIEW

Bioseb's Advanced Dynamic Weight Bearing Test is the result of years of R&D based on the principles of early incapacitance instruments, which we evolved from Static Weight Bearing to the new Advanced Dynamic Weight Bearing 2.0

Thermal and mechanical stimulators are often used to assess pain in rodents, however, ethical considerations as well as the necessity to study comfort and evoked pain levels on rodents lead to the development of **tests avoiding any stimulation on the animals**. Therefore, Weight Bearing assessment of rodents is now well known and largely used for assessing pain sensitivity in rodents.

Among a variety of instruments that allow to measure Weight bearing on the hind paws of rodents, Bioseb's Dynamic Weight Bearing test is **the only rodent evoked pain test not requiring animal restraint**. It is also the only instrument allowing you to precisely measure changes in Postural Equilibrium in rodents by assessing their weight distribution on each one of their 4 paws.

After 10 years of development the new version DWB2 offers unprecedented improvements increasing both speed and software user experience while optimizing results accuracy and reliability such as :

- **Fast and reliable**, automatic postural analysis algorithms
- **New 3-tab interface**: Settings/ Experiment/ Analysis. Simple and Straightforward
- **Group management** module and animal lists for GLP procedures

### HOW DOES IT WORK?

The DWB relies on two different technologies :

A **matrix comprising around 2000 high precision force sensors** to measure the weight distribution on each of the four paws of the animal in grams. The instrument uses different sensors for rats or mice in order to provide a suitable sensitivity level (0-4g for mice and 0-40g for rats).

A **video monitoring** : the animal is filmed from above using a high definition camera. The video feed is analyzed in real-time during the test thanks to our tracking software allowing a precise analysis of the animal's posture.

Eventually, our software can accurately analyzes the animal's position during the entire duration of the test in order to automatically identify the location of each of the four paws on the force sensors.

### KEY FEATURES

- User friendly software
- Operator-independent test with automatic scoring
- No stress induced on the animal (rat or mouse)
- Unique assessment of the 4 paws

### TECHNICAL SPECIFICATIONS

**Camera** 640x480 USB-based camera high resolution delivered with its lens

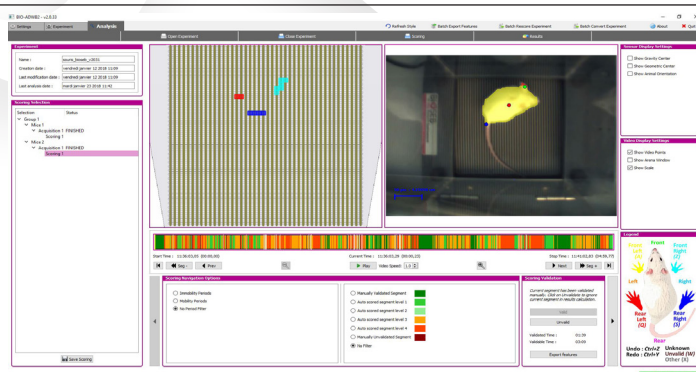
**Versions available** 3 versions: rat, mouse, combined rat+mouse

# DWB: Advanced Dynamic Weight Bearing 2.0 - New Incapacitance Test

## DEDICATED SOFTWARE

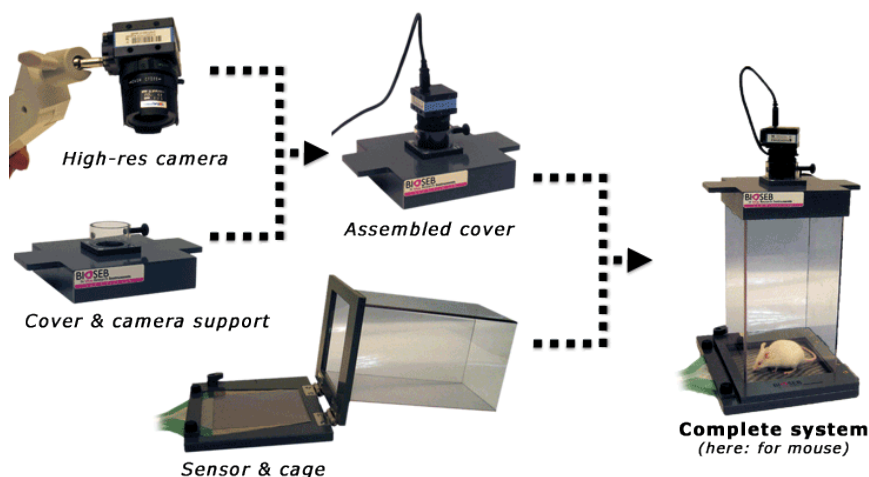
### Parameters measured:

- Weight for each paw (g and % total animal weight)
- Weight for grouped front and rear paws (g and % total animal weight)
- Left/Right and Front/Rear weight ratio
- Surface for each paw (mm<sup>2</sup>)
- Surface for grouped front and rear paws (mm<sup>2</sup>)
- Variability (standart deviation/mean) for each parameter
- Parameters given for each posture and as a mean for the whole experiment
- Total time spent on each paw over the whole experiment (s)
- Duration of different postures (4 paws, rearing...) over the whole experiment (s)
- Total time spent on each paw over the whole experiment (s)



Screenshot of Bioseb's Advanced DWB Software: Dual video + sensor approach

## SYSTEM OVERVIEW: CAMERA, COVER, CAGE



## DOMAINS OF APPLICATION

### Pain - Nociception/Analgesia

- Bone cancer models
- Neuropathic models
- Inflammation model
- Post surgery models
- Osteo-arthritis models
- Arthrose models
- Pelvic pain models

### Physiology

- Peripheric ischemia
- Cerebrovascular accident models

### Neurology

- Spinal cord injuries recovery process

### Other research applications

- Calcaneal tendon disease
- Crucial ligaments disease
- Vestibular disorders

## HIGHLIGHTED BIBLIOGRAPHY Exhaustive list on our website



**Methods Used to Evaluate Pain Behaviors in Rodents**, *Frontiers in molecular Neuroscience* (2017), J.R. Deuis, L.S. Dvorakova, I. Vetter et al, DOI: 10.3389/fnmol.2017.00284 - *Domain of application: Pain*

**Adjustment of the dynamic weight distribution as a sensitive parameter for diagnosis of postural alteration in a rodent model of vestibular deficit**, *PLOS One* (2017), B Tighilet et al, DOI: 10.1371/journal.pone.0187472 - *Domain of application: Sensory systems*

**Polytherapy with a combination of three repurposed drugs (PXT3003) down-regulates Pmp22 over-expression and improves myelination, axonal and functional parameters in models of CMT1A neuropathy**, *Int Orphanet J Rare Dis.* (2014), Chumakov I et al, DOI:10.1186/s13023-014-0201-x - *Domain of application: Muscular systems*

**Peripheral sensitization and neuropathic pain in the rat medial meniscal tear model of post-traumatic osteoarthritis**, *Osteoarthritis and Cartilage* (2018), M.S. O'Brien et al, DOI: 10.1016/j.joca.2018.02.708 - *Domain of application: Joints*

**Thirty-five Day Fluoxetine Treatment Limits Sensory-Motor DePcit and Biochemical Disorders in a Rat Model of Decompression Sickness**, *Frontiers in Physiology* (2017), C Cosnard et al, DOI: 10.3389/fphys.2017.00604 - *Domain of application: Metabolism*

## ORDERING INFORMATION

Reference	Description
BIO-DWB-AUTO-M	For mice
BIO-DWB-AUTO-R	For rats
BIO-DWB-AUTO-DUAL	Dual: for rats and mice

The ADVANCED DWB is available in three setups offering different dimensions and sensors, depending on the rodents being tested: **RAT** (BIO-DWB-AUTO-R), **MICE** (BIO-DWB-AUTO-M), **COMBINED RATS & MICE** (BIO-DWB-AUTO-DUAL).

**FOR MORE INFORMATION, VISIT OUR WEBSITE: [WWW.BIOSEB.COM/DWB](http://WWW.BIOSEB.COM/DWB)**

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