

# Electrocardiogram (ECG) IMPC\_ECG\_001

## Purpose

To provide a high throughput method to obtain Electrocardiograms in a conscious mouse.

## Experimental Design

- **Minimum number of animals** : 5M + 5F
- **Age at test**: Week 12
- **Sex**: We would expect the results of this test to show sexual dimorphism

## Procedure

1. The lead plates are to be snapped into place onto the top of the pre-amplifier tower. The covering is removed to reveal three gel coated pads surrounded by a sticking plate. The plate will need to be covered with the extra cover in the package.
2. Turn on the combined amplifier and the pre-amplifier tower.
3. Double click the icon ECG acquisition on the acquisition computer.
4. Open the ECG set up file (for default settings).
6. Place mouse on pad, lowering the Red Acrylic Cubby to surround the mouse on 3 sides discouraging escape.
7. Press Start.
8. After the desired acquisition time, (5-10 minutes) stop the reading. There will be one long reading.
9. Save the data.
10. For additional readings create a new session using the same settings as before.
11. When saving sections with good readings, highlight the selected area and then save.

## Notes

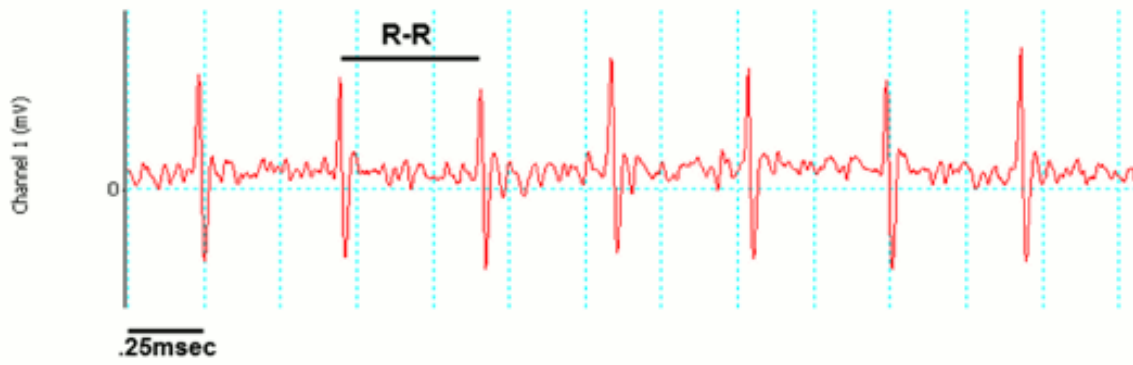
### Data Analysis

1. Open Emouse Analyses icon
2. Select ECG signals
3. Choose folder (all readings in folder will show)
4. Click PNN X (for mice: N-N > than 6 ms)
5. Choose file(s) by highlighting
6. Go
7. Bottom file is the corrected file
8. Red dots should be on peak of R waves, if image appears inverted click invert
9. Click Add, or minus if R waves are not marked with red dots or if too many are marked
  - L click to zoom in

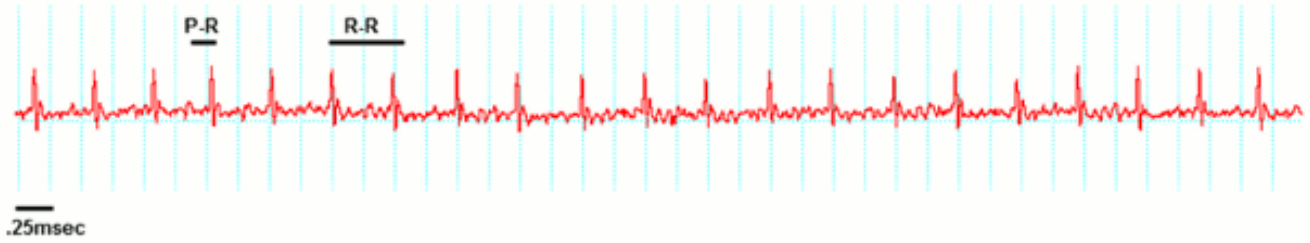
- R click to zoom out
10. 'What if?' button to remove unwanted sections
    - L click image (zooms in)
    - L click left boundary
    - L click right boundary
  11. Options- click more if want to exclude more sections
  12. Undo available
  13. Go
  14. Here can input animal data if desired
  15. Save- For the first mouse in in group, hit save, a new results folder will be created within the folder with the mouse data. Then can click quick save or next.
  16. For the rest of the mice in the series, can hit quick save at this point- saves in last selected file – will group all files together in same excel sheet.
  17. Open Emouse Analyses icon
  18. Select ECG signals
  19. Choose folder (all readings in folder will show)
  20. Click PNN X (for mice: N-N> than 6 ms)
  21. Choose file(s) by highlighting
  22. Go
  23. Bottom file is the corrected file
  24. Red dots should be on peak of R waves, if image appears inverted click invert
  25. Click Add, or minus if R waves are not marked with red dots or if too many are marked
    - L click to zoom in
    - R click to zoom out
  26. 'What if?' button to remove unwanted sections
    - L click image (zooms in)
    - L click left boundary
    - L click right boundary
  27. Options- click more if want to exclude more sections
  28. Undo available
  29. Go
  30. Here can input animal data if desired
  31. Save- For the first mouse in in group, hit save, a new results folder will be created within the folder with the mouse data. Then can click quick save or next
  32. For the rest of the mice in the series, can hit quick save at this point- saves in last selected file - will group all files together in same excel sheet

Examples of good readings

**A**



**B**



## Data QC

Analysis room should be dim and quiet. Keep the door closed preferably while analysis is taking place.

Figure A. Taking a reading

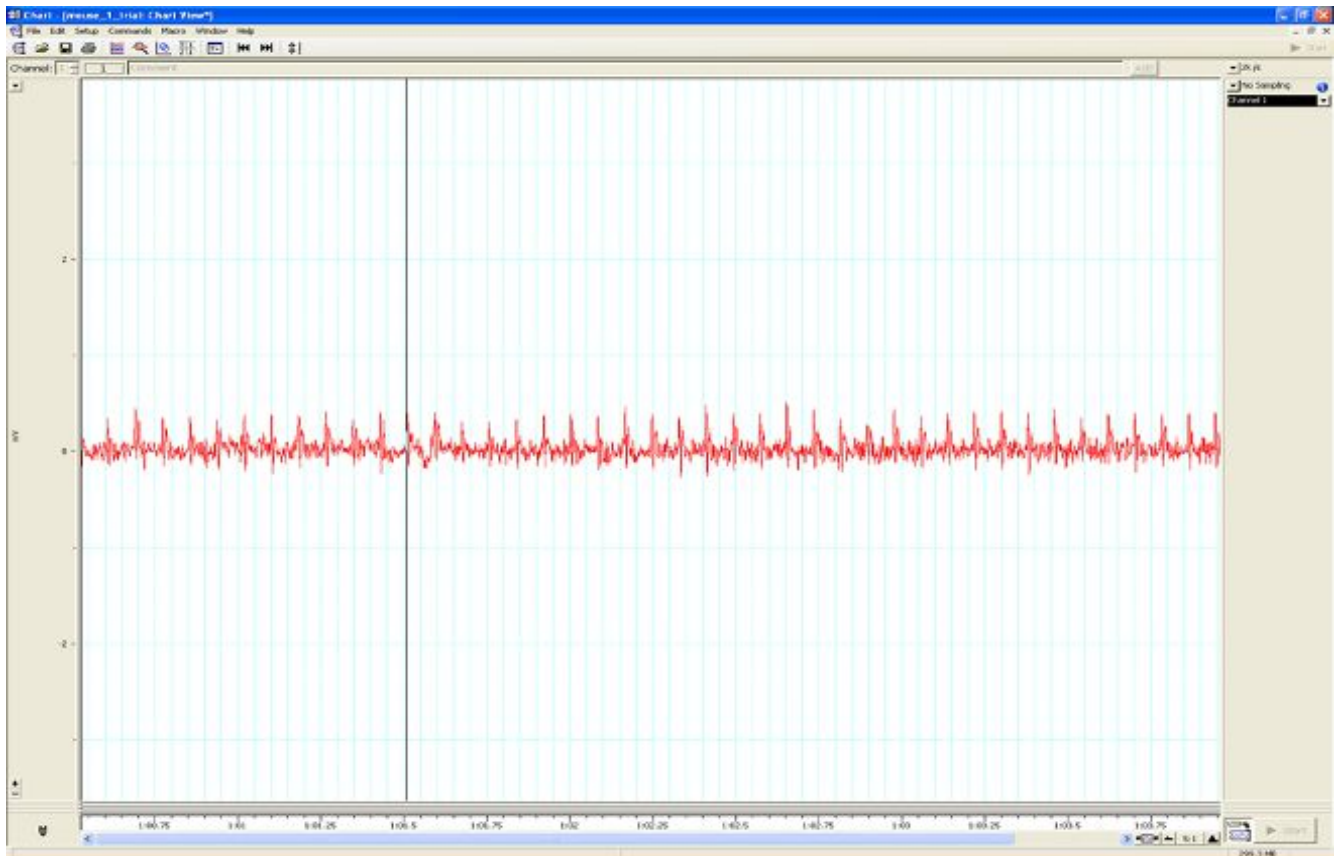


Figure B. Saving a section of the reading

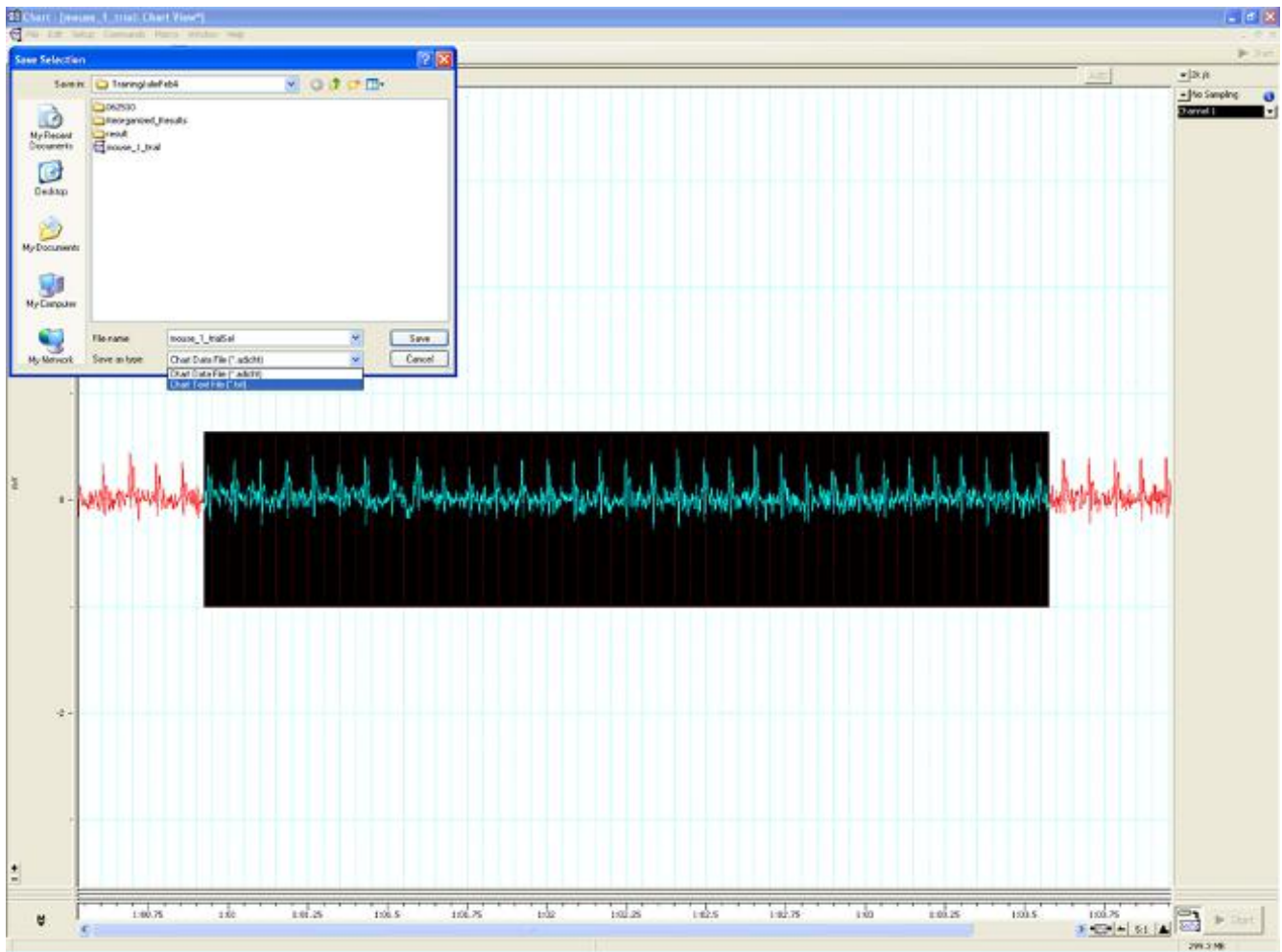
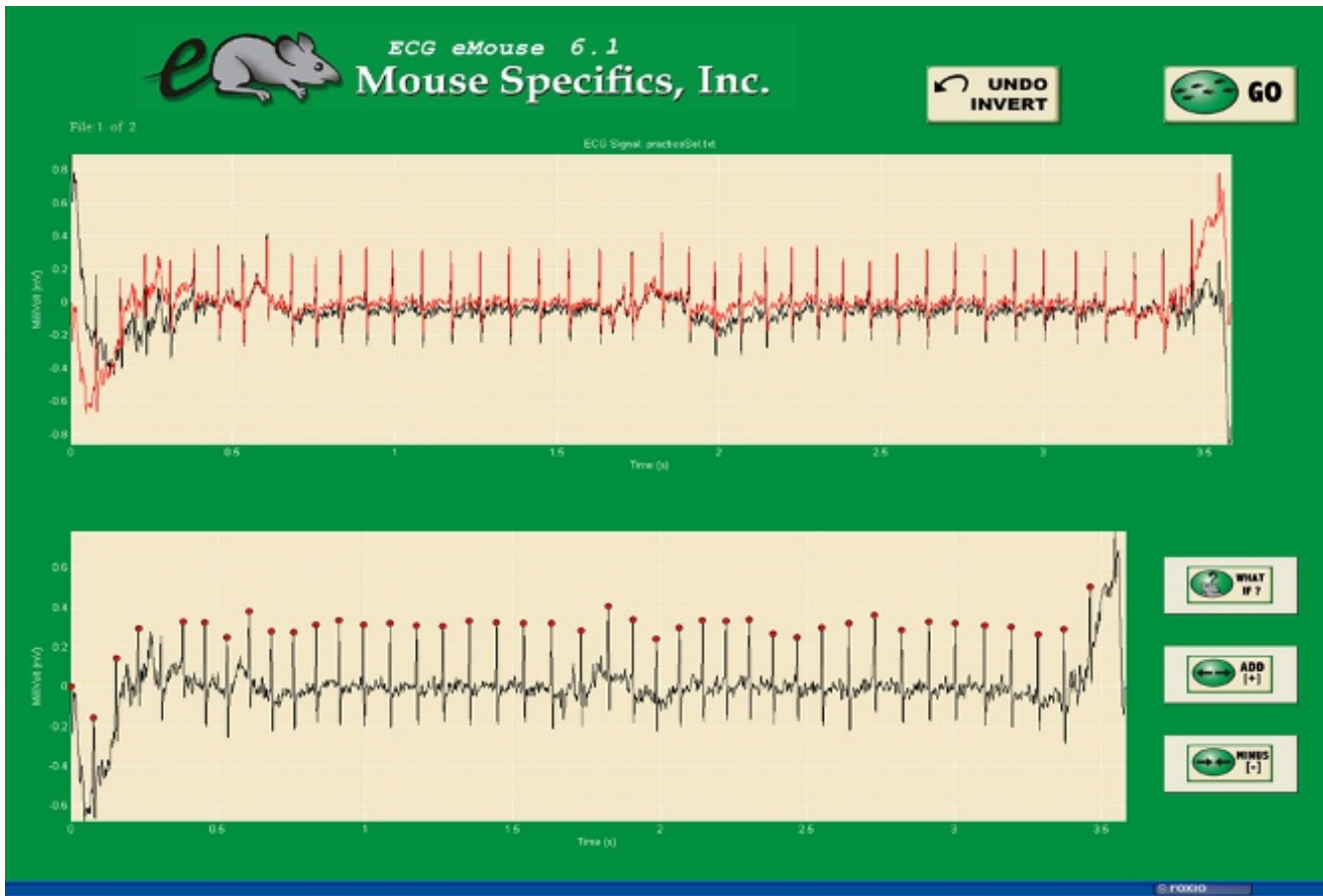


Figure C. Analysis phase, with the options to remove sections on the 'What if?' button below.



## Parameters and Metadata

### Number of signals IMPC\_ECG\_001\_001 | v1.2

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: false

### HR IMPC\_ECG\_002\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: bpm

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**CV** IMPC\_ECG\_003\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: %

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**RR** IMPC\_ECG\_004\_001 | v1.2

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: ms

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**PQ** IMPC\_ECG\_005\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: ms

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## **PR** IMPC\_ECG\_006\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: ms

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## **QRS** IMPC\_ECG\_007\_001 | v1.2

simpleParameter

Req. Analysis: false

Req. Upload: true

Is Annotated: true

Unit Measured: ms

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## **ST** IMPC\_ECG\_008\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: ms

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## **QTc** IMPC\_ECG\_009\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: ms

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## **HRV** IMPC\_ECG\_010\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: bpm

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## **QTc Dispersion** IMPC\_ECG\_011\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: ms

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## **Mean SR amplitude** IMPC\_ECG\_012\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: mV

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## Mean R amplitude IMPC\_ECG\_013\_001 | v1.1

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: mV

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## rMSSD IMPC\_ECG\_014\_001 | v1.0

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: true

Unit Measured: ms

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## pNN5(6>ms) IMPC\_ECG\_015\_001 | v1.2

simpleParameter

Req. Analysis: false

Req. Upload: false

Is Annotated: false

Unit Measured: %

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## Equipment ID IMPC\_ECG\_016\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Equipment Manufacturer IMPC\_ECG\_017\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Options: Mouse Specifics, Inc., AD Instruments, World Precision Instruments, Indus Instruments,

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## Equipment Model IMPC\_ECG\_018\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Options: ECGenie, ML870/p, ML826/FE132, Iso-DAM8A, ECGenie + gel pads, ML866, Mouse MonitorS, PowerLab: 4/35, ML826MS1,

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## Anesthetic IMPC\_ECG\_019\_001 | v1.0

procedureMetadata

Req. Analysis: true

Req. Upload: true

Is Annotated: false

Options: Isoflurane, No anesthesia, Avertin, Tribromoethanol,

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## Experimenter ID IMPC\_ECG\_020\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: true

Is Annotated: false

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## Noise level IMPC\_ECG\_021\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Light level IMPC\_ECG\_022\_001 | v1.0

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Date equipment last calibrated IMPC\_ECG\_023\_001 | v1.1

procedureMetadata

Req. Analysis: false

Req. Upload: false

Is Annotated: false

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## Analysis Software IMPC\_ECG\_024\_001 | v1.0

procedureMetadata

**Req. Analysis:** true

**Req. Upload:** false

**Is Annotated:** false

**Options:** eMouse, Matlab, PowerLab,

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## Waveform Image IMPC\_ECG\_025\_001 | v1.0

seriesMediaParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Increments:** Minimum 1

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## Waveform Image Comment IMPC\_ECG\_026\_001 | v1.0

simpleParameter

**Req. Analysis:** false

**Req. Upload:** false

**Is Annotated:** false

**Description:**

Free text comment on the waveform image. Use parameterAssociation of the image parameter to link to this text.

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