

# Scisense Pressure Publication Brief

## Validation of a New Micro-Manometer Pressure Sensor for Cardiovascular Measurements in Mice

Trevino RJ, et al. Biomedical Instrumentation & Technology 2010

### OBJECTIVE

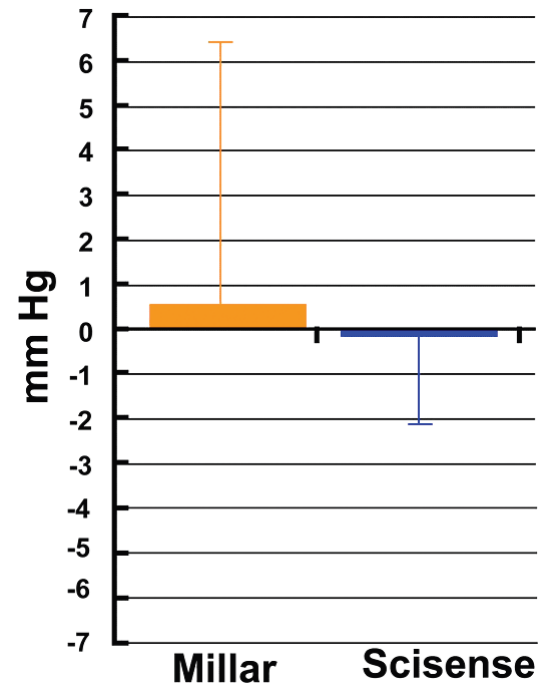
Compare the performance of the 1.2F Scisense Pressure Catheter to the 1.4F Millar Catheter in a series of *in vitro* and *in vivo* experiments.

### METHODS

- A total of nine 1.4F Millar and eleven 1.2F Scisense Catheters were used for all experiments. Each protocol used between 3 -6 Catheters of each brand.
- *In Vitro* assessments were made for Temperature Drift and Frequency Response up to 250 Hz.
- A Pop Test was used to determine natural frequency and damping coefficient.
- *In Vivo* Isoproterenol Dose Response and Dobutamine Dose Response tests were used to assess dP/dt performance.
- Pressure Drift post intervention was examined over a 45 minute period.
- Simultaneous Left-Ventricular Pressure Measurements were taken from both Catheters in the same LV during steady state, transient occlusion of the inferior vena cave, aortic pinch and arrhythmias.

### RESULTS

- There was no significant difference in Frequency Response or the amount of Temperature Drift, though Millar tended to overestimate pressures while Scisense underestimated pressures.
- The natural frequency and damping coefficients as determined from the Pop Test were not significantly different.
- There was no significant difference in how the Catheters measured + dP/dt or -dP/dt in either dose response study.
- The pressure drift over 45 minutes was very low and not significantly different between the Catheters.
- There was no significant difference in the measurements of left ventricular peak systolic pressure, left ventricular end-diastolic pressure, +dP/dt, or -dP/dt for any condition.



Pressure drift over 45 minutes for a Scisense Catheter and a Millar Catheter.

# Scisense Pressure Publication Brief Cont.

## CONCLUSIONS

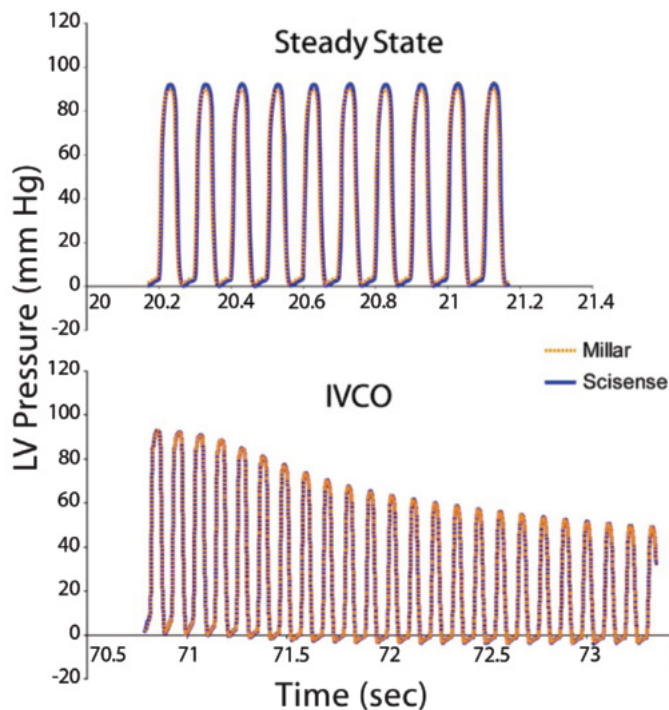
"We conclude that both sensors are equivalent, and that the Scisense pressure sensor represents an alternative to the current gold standard, the Millar micro-manometer pressure sensor for *in vivo* pressure measurements in the mouse."

## TRANSONIC® SCISENSE COMMENTS

The Scisense Pressure Sensor recessed inside protective housing gives the same performance with smaller diameter (1.2F instead of 1.4F) and smoother Catheter tip profile.

## REFERENCE

Trevino RJ, Jones DL, Escobedo D, Porterfield J, Larson E, Chisholm GB, Barton A, and Feldman MD (2010) "Validation of a New Micro-Manometer Pressure Sensor for Cardiovascular Measurements in Mice." Biomedical Instrumentation & Technology: January/February 2010, Vol. 44, No. 1, p. 75-83.



Simultaneous pressure measurements in a mouse LV by 1.2F Scisense Catheter and 1.4F Millar Catheter during steady state and IVC occlusion.