DSI™
An Affiliate of Harvard Bioscience, Inc.

DSI Pressure Sensing Technology

Recent clinical blood pressure guidance from the FDA is driving uncertainty in the preclinical drug discovery and development process. Know you're in good hands when you partner with DSI, an innovator in physiologic monitoring and pressure sensing technology. Delivering quality, dependability, and superior performance has been fundamental to DSI's wide acceptance as the "gold standard" for chronic physiologic monitoring. It's why DSI telemetry products are routinely used by virtually all the world's top drug developers and academic research centers.

DSI's High-Performance Pressure Sensing

DSI's pressure sensing capabilities are referenced in the American Heart Association Blood Pressure Measurement recommendations as a "…powerful methodology for investigating short-term and long-term regulation of BP and its variability." [1]The advent of DSI pressure sensing technology with best-in-class chronic sensor stability, biocompatibility, and easier surgical deployment has allowed scientists to conduct chronic telemetry studies that were previously impossible.

5,000+
Pressure publications cite use of DSI Technology

10,000+
DSI pressure implants are used annually around the world

Accurate Dynamic Pressure Waveform Reproduction

When using a digital system to accurately reproduce any waveform, the sample rate must be at least two times greater than the highest frequency component within the signal.[2,3] Geddes has validated that a frequency response of six times the heart rate (highest cardiac frequency) allows for good reproduction of an arterial blood pressure waveform, (this same rule does not apply for good reproduction of a left ventricular pressure waveform).[4] For a rat with a heart rate of 360 BPM, the main frequency content is 6 Hz, therefore good reproduction of the arterial blood pressure waveform would require a frequency response of 36 Hz. Our most recently developed 8 cm rat catheter has a frequency response more than 15 times the typical heart rate of a rat (>100Hz at -3dB) and has been demonstrated to offer equivalent performance to a Millar catheter in controlled comparisons of systemic pressure signals (Figures 1 and 2).

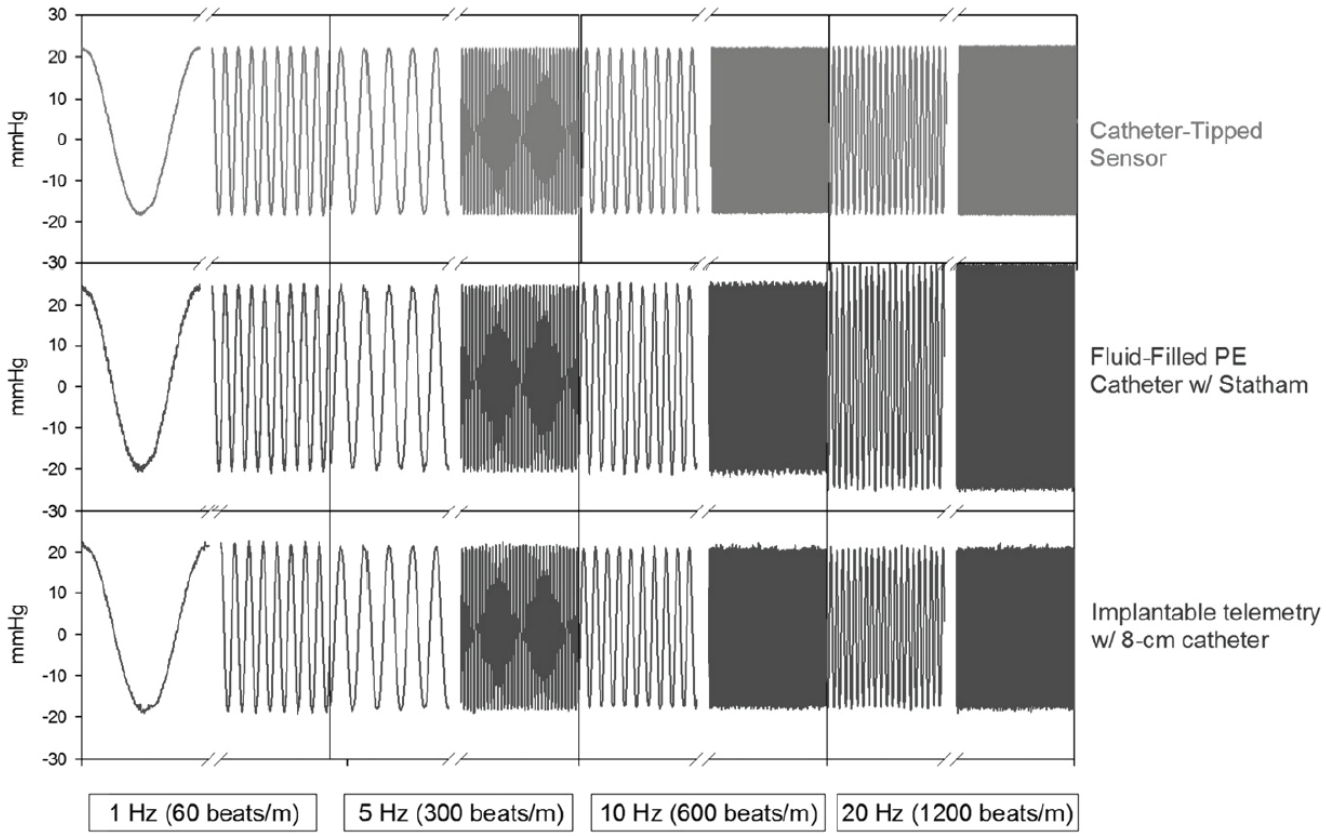

Figure 1: Plot demonstrating signal amplitude of three different pressure-sensing technologies at various simulated heart rates.[5]

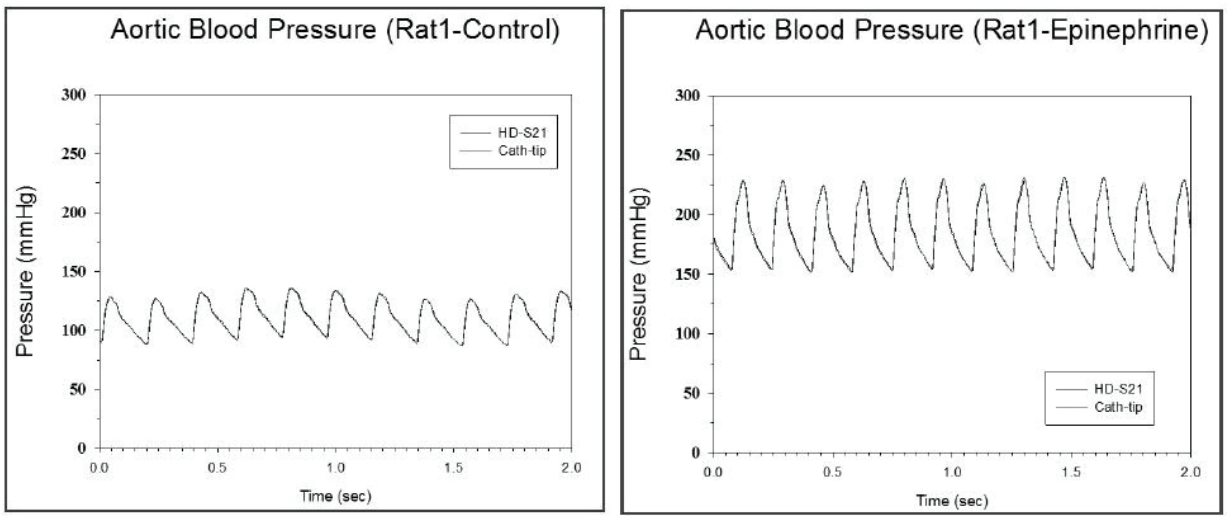

Figure 2: Superimposed arterial blood pressure signals from an implanted DSI HD-S21 and a Millar catheter-tipped sensor.[6]

Your Partner in Effective Drug Discovery and Development

DSI's pressure sensing technology offers equivalent performance to Millar catheters in conscious, freely moving animals in acute and chronic studies. By housing the pressure sensor within the implant body, rather than at the catheter tip, researchers experience less risk of sensor damage during implant and explant surgeries. This enables higher quality data, fewer experimental delays, a reduction in animal use, and ultimately, better results.

References

[1]Kurtz TW, Griffin KA, Bidani AK, Davisson RL, Hall, JE. Recommendations for Blood Pressure Measurement in Humans and Experimental Animals. Part 2: Blood Pressure Measurement in Experimental Animals. Hypertension. 2005; 45:299-310.

[2]Sarazan, R.D., Kroehle, J.P. and Main, B.W. Left ventricular pressure, contractility and dP dtmax in nonclinical drug safety assessment studies. Journal of Pharmacological and Toxicological Methods, 66:71-78. 2012.

[3]H. Nyquist, "Certain topics in telegraph transmission theory," Trans. AIEE, vol. 47, pp. 617-644, Apr. 1928.

[4]Geddes, L.A. "Handbook of Blood Pressure Measurement." Clifton: The Humana Press, 1991.

[5]Sarazan RD. Cardiovascular pressure measurement in safety assessment studies: technology requirements and potential errors. J Pharmacol Toxicol Methods. 2014 Nov-Dec;70(3):210-23. doi: 10.1016/j.vascn.2014.06.003. Epub 2014 Jun 14. PMID: 24933393.

[6]Data generated from a study conducted by DSI's Scientific Services team to evaluate the HD-S21 implant model.

Data Sciences International

119 14th St NW, Suite 100
St. Paul, MN 55112 U.S.A.
Tel: 651-481-7400
Fax: 651-481-7404

Sales: sales@datasci.com

Technical Support: support@datasci.com

Web: www.datasci.com

European Sales: sales@datasci.com

Asia Pacific Sales: sales@datasci.com