

Data Services: Understanding Heart Rate Variability

A biotechnology company working with a mouse model wanted to collect autonomic nervous system parameters. Although this group has experience with collecting cardiovascular parameters with telemetry, this long-time customer contacted DSI Data Services seeking guidance on conducting a heart rate variability study (HRV) – an area of research where they lacked practical experience. HRV is the physiological phenomenon of the variation in the time interval between heartbeats, measured by the variation in the beat-to-beat interval.

THE CHALLENGE. The researcher planned to collect data from 20 mice for a seven day study. However, since some HRV parameters are derived from complex equations, analyzing and interpreting heart rate variability data can be difficult, especially without prior experience.

THE SOLUTION. DSI Data Services proposed modifications to the study design including:

- Study duration and amount of data needed to meet study objectives
- Number of animals required
- Analysis of ECG data to derive HRV results

THE OUTCOME. The researcher collected data from 20 mice for a period of one month. DSI calculated the necessary HRV parameters. DSI reported what each parameter signified in terms of its impact on the autonomic nervous system. The customer benefited in the following ways:

- **Quick start:** DSI's comprehensive proposal allowed the researcher to quickly decide where help was most needed and initiate the study immediately thereafter.
- **Unexpected findings:** To the surprise of the researcher, DSI identified arrhythmia events that would have otherwise gone unnoticed.
- **Rapid results:** The data collected for one month in 20 animals was analyzed and summarized in just a few weeks.

DSI developed a solution that best met the customer's needs, allowing the biotech to complete their study quickly and affordably, with the necessary evidence to support the mouse model phenotype.

Since the creation of this case study, DSI Data Services has supported several subsequent HRV analysis projects for this customer, in addition to similar services with several additional pharmaceutical companies.