Supporting Information

Appendix A. Explanation of Dominant and Harmonic Frequencies

Most signals contain energy at both a fundamental ('dominant') frequency, as well as at 'harmonic' frequencies, which occur at multiples of the fundamental frequency at diminishing power. Analysis and interpretation of the harmonics and dominant frequency (from Fourier Transform) of a signal should be undertaken with caution as unwanted noise such as power-line interference could cause artifacts in the resultant frequency domain transformation.

Supplementary Figure 1 presents an illustration of dominant and harmonics frequencies. The first signal is a sine wave, which by definition contains only a dominant frequency and no harmonics, due to the definition of the Fourier Transform (Supp. Inf. Fig. 1A). The second signal is a typical 'saw tooth' signal, in which energy is contained in harmonic frequencies (Supp. Fig. 1B). The sharp negative deflection in the 'saw tooth' signal causes the harmonics at defined multiples of the dominant frequency. The third signal is one where the sine wave and the saw tooth signal are added together, approximating the morphology of extracellular slow wave recordings (Supp. Inf. Fig. 1C).

[Insert Supp. Inf. Figure. A1]

Appendix B. Application of Various Filters in Extracellular Gastric Slow Wave Recordings in Pigs and Humans

[Insert Supp. Inf. Figure. B1]
[Insert Supp. Inf. Figure. B2]
[Insert Supp. Inf. Figure. B3]

Figure Captions

Supp. Inf. Figure. A1: Illustration of dominant and harmonic frequencies. The time domain signal (left panel) and its corresponding frequency domain (computed via a Fourier transform; right panel) are demonstrated. A 3 cpm sine wave is shown in panel (a), and a 3 cpm ‘saw tooth’ signal in panel (b). The frequency domain of the signals reveals the dominant and harmonic spectral components. A third signal (panel (c)) approximates an extracellular gastric slow wave signal, which was created by adding the sine and saw tooth signals, and demonstrates multiple harmonics. (Adapted from Ng J, Goldberger JJ. Understanding and interpreting dominant frequency analysis of AF electrograms. J Cardiovasc Electrophysiol 2007; 18: 680–5).

Supp. Inf. Figure. B1: Application of various filters to a second human extracellular *in-vivo* gastric serosal slow wave recording. The time domain signal (left column) and its corresponding frequency domain (right column, computed vina a Fourier transform) are shown. (a) Raw in-vivo gastric slow wave recording. (b) The same signal after removal of baseline wander using a 20 second moving median filter. All of the remaining plots (in the time domain) are filtered from the baseline removed signal. (a) shows the application of a SG (Savitzky-Golay) filter, while (d) the use of a bandpass FIR filter (17, 18). (e) and (f) is the application of bandpass Bessel (3-100 Hz) and Butterworth (5-100 Hz) filter similar to that of Bayguinov et al (15). In the frequency domain, (a)-(d) are displayed in the 0-100 cycles per minute (cpm) range, while (e) and (f) are displayed in the 0-900 cpm range.

Supp. Inf. Figure. B2: Application of various filters to a pig extracellular *in-vivo* gastric serosal slow wave recording. The time domain signal (left column) and its corresponding frequency domain (right column, computed via a Fourier transform) are shown. (a) Raw in-vivo gastric slow wave recording. (b) The same signal after removal of baseline wander using a 20 second moving median filter. All of the remaining plots (in the time domain) are filtered from the baseline removed signal. (c) shows the application of a SG (Savitzky-Golay) filter, while (d) the use of a bandpass FIR filter (17, 18). (e) and (f) is the application of bandpass Bessel (3-100 Hz) and Butterworth (5-100 Hz) filter similar to that of Bayguinov et al (15).

In the frequency domain, (a)-(d) are displayed in the 0-100 cycles per minute (cpm) range, while (e) and (f) are displayed in the 0-900 cpm range.

Supp. Inf. Figure B3: Application of various filters to another pig extracellular *in-vivo* gastric serosal slow wave recording. The time domain signal (left column) and its corresponding frequency domain (right column, computed via a Fourier transform) are shown. (a) Raw in-vivo gastric slow wave recording. (b) The same signal after removal of baseline wander using a 20 second moving median filter. All of the remaining plots (in the time domain) are filtered from the baseline removed signal. (c) shows the application of a SG (Savitzky-Golay) filter, while (d) the use of a bandpass FIR filter (17, 18). (e) and (f) is the application of bandpass Bessel (3-100 Hz) and Butterworth (5-100 Hz) filter similar to that of Bayguinov et al (15). In the frequency domain, (a)-(d) are displayed in the 0-100 cycles per minute (cpm) range, while (e) and (f) are displayed in the 0-900 cpm range.