

# Interoceptive C-Tactile stimulation for Heart Rate Variability enhancement

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Traditionally, neuroscience and psychology have studied the body from outside, i.e. how the external senses (vision, hearing etc.) affect our behaviour, cognition and health. This approach misses a crucial aspect of the experience, which is 'interoception', defined as the sense of the physiological state of our inner body. Recently, interoception has reshaped thinking about wellbeing and health. However, despite increasing evidence of the fundamental role interoceptive processing plays in every aspect of our life, there have been almost no attempts to develop scientifically-grounded interoceptive protocols that can manipulate the interoceptive system and thus enhance human wellbeing. To address the challenges, we have recently developed a first-iteration technological prototype (iStim) that stimulates the interoceptive system, through non-invasive inputs directed at highly specialised C-Tactile afferents on the skin. Intriguingly, human and animal models show that this stimulation can reduce acute and chronic stress, anxiety and pain; while enhancing, parasympathetic autonomic responses, emotional bonding and affiliation, also reducing feelings of social exclusion. We will therefore discuss the role of the interoceptive system, and we will review the effect of the CT stimulation both in healthy and clinical population, highlighting how this specific afferent system can serve as a gateway to our health. Lastly, we will present preliminary data where CT stimulation successfully artificially enhanced parasympathetic heart rate variability (HRV) in healthy participants, discussing therefore potential applications of heart rate variability enhancement on different domains.