Sten Grillner

His research has focused on the extraordinary capability of the brain to control movement. Early on he demonstrated that networks within the mammalian spinal cord can produce the detailed motor pattern of locomotion involving the coordination of hundreds of different muscles. In a paper published in 1987, he and James Buchanan provided a putative network scheme of interacting interneurons in the lamprey spinal cord, a model vertebrate system ¹⁾

The significance of the spinal circuitry in controlling postural and locomotor functions largely reemerged in the mid-1970s under the leadership of Sten Grillner, demonstrating key phenomena of "central pattern generator" and "fictive locomotion" with an evolutionary perspective. These concepts raised the question of how much function can be recovered after paralysis, given the intrinsic automaticity of spinal networks in injured and uninjured states in adults.

A review explores biological mechanisms governing spinal control of movements such as posture and locomotion. They focused on concepts that have evolved from experiments performed over the past decade. Rather than a comprehensive review of the vast literature on the neural control of posture and locomotion, they focused on the various mechanisms underlying functional automaticity, and their clinical relevance.

They proposed that multiple combinations of sensory mechanoreceptors linked to proprioception generate an infinite number of different sensory ensembles, having species-specific meaning and extensive influence in controlling posture and locomotion. These sensory ensembles are translated as a probabilistic phenomenon into highly specific but indeterminate actions. Therefore, they opined that spinal translation of these ensembles in real-time plays a central role in the automaticity of motor control in individuals with and without severe neuromotor dysfunction ².

1)

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