

Research offers insights into nervous system control of leg movements

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New research from a team at Marshall University Joan C. Edwards School of Medicine gives unexpected insights into how the nervous system controls leg movements in walking.

These findings could aid in directing rehabilitation in stroke patients as well as the design of artificial, or prosthetic, legs.

The research team of Sasha N. Zill, Ph.D., and Sumaiya Chaudhry, in collaboration with Chris J. Dallmann, Ph.D., and Josef Schmitz, Ph.D, at Bielefeld University and Ansgar Büschges, Ph.D., at the University of Cologne, applied forces and joint torques to the legs of stick insects to determine their impact on muscle activation. Their findings were published on July 18, 2018, in the *Journal of Neurophysiology*.

"Our research shows that dynamic signals from sense organs that detect changes in load are critical in producing normal [leg movements](#)," said Zill, senior author and professor of anatomy in the department of biomedical sciences at the Joan C. Edwards School of Medicine.

"Current prosthetic devices for leg amputees incorporate sensors and microprocessors to regulate joint stiffness. The new findings suggest mechanisms for making these joints more adaptable, permitting more natural leg movements."

More information: Sasha N. Zill et al, Force dynamics and synergist muscle activation in stick insects: the effects of using joint torques as mechanical stimuli, *Journal of Neurophysiology* (2018). [DOI:](#)

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Provided by Marshall University Joan C. Edwards School of Medicine

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