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## The Neural Bypass: New Hope for Spinal Cord Injury Patients

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### Letter to Editor

The staggering report on restoring cortical control of functional movement in a human with quadriplegia has reached worldwide scientific attention [1,2]. It stirs up ultimate hope for spinal cord injury (SCI) patients. The new method may not only be useful for quadriplegians but also for paraplegians, and the sensory input from ascending damaged corticospinal tracts should be the next step. The platform is developed (e.g. finger sensors, deep brain stimulation systems), and why not develop an additional connection to the sensory cortex?

Regarding the sensorimotor dysregulation I am not sure if the degree of reorganization occurring after SCI has been overestimated, as it has been stated in the report [2]. This certainly depends on a number of parameters, such as the level and extent of damage, secondary disinhibition of sensorimotor regions, brain plasticity, and time from SCI etc.

For an answer to this, functional neuroimaging, e.g. by using positron emission tomography, functional magnetic resonance imaging or magnetoencephalography, plays a key role.

In conclusion, for the described new method clinical studies are needed and many challenges on the medical and on the engineering side will have to be faced. The first breathtaking neuroprosthetic milestone, however, from the machine to muscles and from non-human primates to human, is reached: the era of a 'neural bypass'.

### References

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2. Geddes L (2016) First paralysed person to be 'reanimated' offers neuroscience insights. *Nature*. doi:10.1038/nature.2016.19749