

# Not Just a Prostheses But a Bodypart

## A New Way of Bidirectional Communication

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**Goal:** This poster presents the targeted muscular reinnervation of neural prostheses. Neural prostheses should facilitate the bidirectional communication between the amputated part and the prosthesis.

**Result:** If the amputation is made closer to the hand, the remaining muscles can be extracted. But, if the amputation is near the shoulder, the muscles that control the hand are lost. When this happens, a targeted muscular reinnervation (TMR) is performed. This is an operation in which nerves are redirected towards other muscles (1), they grow into the new muscle and there they can excite the tissue (2). When the user now moves his hand, nerve signals stimulate the muscles (4) and this produces an electrical signal (5), which is then picked up by sensors on the skin (6). Those sensors then convert the signal into movement of the robot prosthesis (7).

**Relevance:** Through targeted muscle movement, communication difficulties between the user and the prosthesis can be improved and serious problems such as risk of falling or reduced mobility can be overcome. In addition, the prosthesis is perceived more as a part of the body.

**Glossary:** Bidirectional communication = prostheses provide both motor control and tactile sensitivity

