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INTERNET-BASED RESEARCH RESOURCE FOR EMG DECOMPOSITION: SOFTWARE, DATA, AND MORE

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AIMS: EMG decomposition is a powerful tool for investigating issues related to muscle structure and function, but it is not used as widely as it could be. One reason is the lack of widely available software. Although several labs have developed decomposition programs, there has been little intercommunication, standardization, or dissemination. Another reason is skepticism about accuracy. Since decomposition involves complicated algorithms and possibly human supervision, its results cannot be easily verified. The aim of this project is to promote the wider use and acceptance of EMG decomposition by fostering a greater exchange of discussion, software, and data among investigators in this field.

METHODS: We have obtained NIH funding to establish an internet website to serve as a public forum for discussing issues related to EMG decomposition and for exchanging algorithms, software, and sample EMG signals. The website is intended to be a collaboration tool to aid the work of all researchers interested in EMG decomposition and signal processing. The initial content will include a downloadable version of EMGLAB -an EMG viewer and decomposition program written in Matlab- and several illustrative needle and fine-wire EMG signals. Future content will include standards for storing/sharing signals and annotations (spike firing times and motor unit identities), standards for assessing and reporting decomposition accuracy, EMG experiment databases, EMG signal-processing software, and a discussion forum. The website is planned to be launched in June, 2006.

DISCUSSION: We are seeking the involvement of other investigators, both as users and as contributors, who are interested in advancing the field and practice of EMG decomposition. This involvement will include contributing to the development of standards for exchanging EMG signals and annotations; contributing EMG signals to a public database to illustrate the variety of recording and protocol methodologies that are of interest within the community; reviewing decomposition results of a selected subset of signals to establish a consensus about their true full compositions; helping establish standards for assessing and reporting the accuracy of decomposition results; and helping specify and implement open-source programs and toolboxes for EMG decomposition.