

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
Photocopy this page or follow this format for each person.

NAME JOHN CHAE, M.D., M.E.		POSITION TITLE ASSISTANT PROFESSOR OF PM&R	
EDUCATION/TRAINING (<i>Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.</i>)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(S)	FIELD OF STUDY
DUKE UNIVERSITY, DURHAM, N.C.	B.S.E.	1984	BIOMEDICAL ENGINEERING
DARTMOUTH COLLEGE, HANOVER, N.H.	M.E.	1986	BIOMEDICAL ENGINEERING
NEW JERSEY MEDICAL SCHOOL, NEWARK, N.J.	M.D.	1990	MEDICINE
R. W. JOHNSON MEDICAL SCHOOL, PISCATAWAY, N.J.		1991	INTERN, INTERNAL MEDICINE
NEW JERSEY MEDICAL SCHOOL, NEWARK, N.J.		1994	RESIDENT, PM&R

RESEARCH AND PROFESSIONAL EXPERIENCE: Concluding with present position, list, in chronological order, previous employment, experience, and honors. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. If the list of publications in the last three years exceeds two pages, select the most pertinent publications. DO NOT EXCEED TWO PAGES.

PROFESSIONAL EXPERIENCE

1992-1993 Research Enrichment Program for Physiatrists, NIDRR.
 1994-present Attending physician, MetroHealth Center for Rehabilitation, Cleveland, OH
 1994-present Assistant Professor of PM&R, Case Western Reserve University, Cleveland, OH
 1996-2001 Director, Stroke Rehabilitation, MetroHealth Center for Rehabilitation, Cleveland, OH
 1998-present Attending physician, Orthopedics, MetroHealth Medical Center, Cleveland, OH
 2000- present Assistant Professor of Biomedical Engineering, Case Western Reserve University

BOARD CERTIFICATION

1991 Diplomate, National Board of Medical Examiners
 1995 Diplomate, American Board of PM&R

HONORS AND AWARDS

1992 Research Award, New Jersey Society of PM&R
 1992 Research Enrichment Program for Physiatrists Scholarship, NIDRR
 1993 Academic Chief Resident, Department of PM&R, New Jersey Medical School
 1994 Research Award, Department of PM&R, New Jersey Medical School.
 1995 Teaching Award, Center for PM&R, Case Western Reserve University
 1995 New Investigator Award, PM&R Education & Research Foundation
 1995 Excellence in Research Writing Award, Association of Academic Physiatrists
 1995 Rehabilitation Medicine Scientist Development Program Award (K12), NIH-NICHHD
 1998 FIRST Award (R29), NIH-NICHHD

PUBLICATIONS (Last 3 years and relevant publications prior to 3 years)

Chae JC, Johnston MV, Kim H. and Zorowitz RD. Admission Motor Impairment as a Predictor of Physical Disability after Stroke Rehabilitation. *American Journal of Physical Medicine and Rehabilitation* 1995; 74: 218-223.
Chae J, Zorowitz R, Johnston M. Functional Outcome of Hemorrhagic and Nonhemorrhagic Stroke Survivors After Inpatient Rehabilitation: A Matched Comparison. *Am J Phys Med Rehabil* 1996; 75: 177-182.
Chae J, Kilgore K, Triolo R, Creasey G. Functional Neuromuscular Stimulation. In: DeLisa, J., Gans, D., eds. *Rehabilitation Medicine: Principles and Practice*. 4th ed. Philadelphia: J. B. Lippincott Company, 1998: 611-634.
Chae J, Hart R. A comparison of discomfort associated with surface and percutaneous intramuscular electrical stimulation for persons with chronic hemiplegia. *Am J Phys Med Rehabil* 1998; 77: 516-522.
Chae J, Zorowitz R, Johnston M. Role of lesion laterality on the functional status of cortical and subcortical nonhemorrhagic stroke survivors. *Am J Phys Med Rehabil* 1998; 77: 415-420.
Chae J, Bethoux F, Bohinc T, Dobos L, Davis T, Friedle A. Neuromuscular stimulation for upper extremity motor and functional recovery in acute hemiplegia. *Stroke* 1998; 29: 975-97.

- Francisco G, **Chae J**, Chawla H, Kirsblum S, Zorowitz R, Lewis G, Pang S. EMG triggered neuromuscular stimulation for improving the arm function of acute stroke survivors: A randomized pilot study. *Arch Phys Med Rehabil* 1998; 79:570-575.
- Chae J**, Yu D. Neuromuscular stimulation for motor relearning in hemiplegia. *Critical Reviews in Physical Medicine and Rehabilitation* 1999;11:279-298.
- Chae J**, Kilgore K, Triolo R, Creasey G. Neuromuscular Stimulation in Spinal Cord Injury Rehabilitation. *North American Clinics of Physical Medicine and Rehabilitation*. Ed. M. Hammond. 2000;11: 209-226.
- Chae J**, Yu D. Neuromuscular stimulation for neuroprostheses in hemiplegia. *Critical Reviews in Physical Medicine and Rehabilitation* 2000; 12: 1-23.
- Chae J**, Yu D. Application of Neuromuscular Electrical Stimulation for Rehabilitation and Functional Assistance in Hemiplegia. *Assistive Technology* 2000; 12: 33-49.
- Chae J**, Yu D, Walker ME. Percutaneous, Intramuscular Neuromuscular Electrical Stimulation for the Treatment of Shoulder Subluxation and Pain in Chronic Hemiplegia: A Case Report. *Am J Phys Med Rehabil* 2001; 80: 296-301.
- Yu DT, **Chae J**, Fang Z-P, Walker ME. Percutaneous intramuscular neuromuscular electrical stimulation for treating shoulder subluxation and pain in chronic hemiplegia: A pilot study. *Arch Phys Med Rehabil* 2001; 82:20-5.
- Chae J**, Hart R, Knutson J, Fang Z-P. Sensitivity and Selectivity of Intramuscular and Transcutaneous Recording Electrodes in Detecting EMG Signals from Adjacent Forearm Muscles. *Am J Phys Med Rehabil* 2001; 80: 374-379.
- Yu DT, **Chae J**, Walker ME, Hart RL, Petroski GG. A comparison of pain associated with percutaneous intramuscular and transcutaneous neuromuscular electrical stimulation for treating shoulder subluxation in hemiplegia. *Arch Phys Med Rehabil* 2001; 82: 756-60.
- Chae J**, Fang Z-P, Walker M, Pourmedhdi S, Knutson J. Intramuscular EMG Controlled Neuromuscular Electrical Stimulation for Ankle Dorsiflexion Recovery in Chronic Hemiplegia. *Am J Phys Med Rehabil* 2001; 80: 842-847.
- Chae J**, Fang Z-P, Walker M, Pourmehdi S. Intramuscular EMG Controlled Neuromuscular Electrical Stimulation for Upper Extremity Recovery in Chronic Hemiplegia. *Am J Phys Med Rehabil* 2001; 80: 935-941.
- Chae J**, Triolo R, Kilgore K, Creasey G. Functional Electrical Stimulation in Spinal Cord Injury. In: Kirshblum S, Campagnolo D, Delisa J., eds. *Spinal Cord Injury Medicine*. *In-press*.
- Yu DT, **Chae J**. Neuromuscular stimulation for shoulder dysfunction in hemiplegia. *Critical Reviews in Physical Medicine and Rehabilitation*. *In-press*.
- Chae J**, Yu, D. Neuromuscular electrical stimulation for motor restoration in hemiparesis. *Top Stroke Rehabil* *In-press*.
- Chae J**, Yang, G, Park BK, Labatia I. Delay in initiation and termination of muscle contraction, motor impairment and physical disability in upper limb hemiparesis. *Muscle Nerve* *In-press*.

OTHER SUPPORT (Approved future grants and all grants active during the period 6-98 to 5-01)

1R01HD39913-01 (PI: Chae)

1-1-01 to 12-30-04

NIH-NICHD

\$225,000/year

Electrostimulation for hemiplegia

The objective of this study is to demonstrate the efficacy of EMG-controlled neuromuscular electrical stimulation in enhancing the upper limb motor recovery of chronic stroke survivors as reflected by objective measures of motor impairment and physical disability. The study consists of a double-blinded, placebo controlled, randomized clinical trial with follow-up of up to one-year post completion of treatment.

1 R43 NS36484-01A2 (PI: Fang)

4-1-00 to 3-30-02

NIH-NINDS

\$223,000/year

EMG-controlled stimulator for stroke rehabilitation

This SBIR phase II project 1) further develops and tests the tripolar electrode introduced in phase I and 2) evaluates the efficacy of EMG-controlled neuromuscular stimulation in facilitating the motor recovery of acute stroke survivors.

822 E1962G (PI: Ruff)

7-1-99 to 6-30-01

Veterans Affairs

\$25,000/year

Upper and lower extremity FNS for Hemiplegia

The objective of this pilot study is to assess the feasibility of using both upper and lower extremity

neuromuscular stimulation to facilitate motor recovery of chronic stroke survivors.

1 R43HD34996-02 (PI: Fang)
NIH-NICHD

8-1-98 to 7-30-00
\$222,700/year

Stimulator for Preventing Post Stroke Shoulder Subluxation

The goals of this SBIR Phase II project are to complete a prototype development of a miniaturized, microcontroller-based stimulation system and complete a limited randomized clinical trial.

1 R29 HD35616-01 (PI: Chae)
NIH-NICHD

7-1-98 to 6-30-03
\$ 67,191/year

Electrostimulation for stroke rehabilitation: Effects and mechanisms.

The goal of this FIRST award project is to assess the efficacy of EMG-controlled neuromuscular stimulation in facilitating the motor recovery of chronic stroke survivors as reflected by neurophysiologic measures of central motor function.

1 R43 NS36484-01A1 (PI: Fang)
NIH-NINDS (SBIR-Phase I)

7-1-98 to 12-30-98
\$61,500/year

EMG-controlled stimulator for stroke rehabilitation

The long-term objective of this SBIR Phase I project is to develop and commercialize an electrical stimulation device for facilitating motor relearning for stroke survivors.

1K12HD01097-0A1 (Lieberman; Chae PI on subcontract)
NIH-NICHD

7-1-95 to 6-30-98
\$72,000/year

Rehabilitation Medicine Scientist Development Program

The goals of this project are 1) facilitate research training relevant to PM&R, 2) stimulate productivity academic physiatrists PM&R and 3) increase the attractiveness and awareness of academic PM&R

OVERLAP