# 行政院國家科學委員會專題研究計畫 成果報告

## 探討在遠端肌激痛點做乾針刺激對近端肌激痛點活性之影響的神經通路/一種可能的針灸之神經機制

## 研究成果報告(精簡版)

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計 畫 主 持 人：洪章仁
共 同 主 持 人：謝悅齡、周立偉
計畫參與人員：其他-兼任助理人員：楊舜安

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# 行政院國家科學委員會補助專題研究計畫成果報告
## 探討在遠端肌激痛點做乾針刺激對近端肌激痛點活性之影響的神經通路－一種可能的針灸之神經機制
## 第一年結案報告

計畫類別：☑ 個別型計畫　　□ 整合型計畫
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共同主持人：周立偉醫師
　　謝悅齡副教授
計畫參與人員：楊舜安

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執行單位：弘光科技大學 物理治療系

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# INTRODUCTION

Myofascial pain is one of the most common examples of musculoskeletal pain. An accumulating body of evidence suggests that unique hypersensitive loci and soft tissue tenderness, called myofascial trigger points (MTrP), are intimately associated with the pathophysiology and clinical manifestation of myofascial pain (Simons, 2004). Typically, the pain begins with the patient having only one MTrP (key MTrP) in the affected muscle, but easily expand to other regions due to the development of additional MTrPs (satellite MTrPs) if it is not appropriately treated (Simons, 2004). In the MTrP region, electromyographic (EMG) activity of endplate noise (EPN) can be recorded. Both the prevalence and amplitude of EPN are highly correlated with the irritability of an MTrP (Kuan, et al., 2007; Chou, et al., 2009) and can be used as indicators to assess the effectiveness of MTrP therapy (Hong, 2001, 2002).

The practice of dry needling directly into the key MTrP to alleviate myofascial pain has long been established and widely used in treating patients (Fernandez-Carnero et al., 2010b; Hong, 2006; Hsieh et al., 2007; Srbely et al., 2010). Clinicians can adopt either the orthodox approach of injection or the medical acupuncture approach of dry needling. It is possible that the strong pressure stimulation of needling to the MTrP units (loci) can elicit strong nociceptors stimulation and provide very strong afferent impulses to the dorsal horn cells and inhibitory interneuron in the spinal cord, which can then break the vicious cycle of the "MTrP circuit" (Hong, 2002).

Moreover, in addition to direct dry needling at key MTrP, clinical studies have demonstrated a similar effect occurring at the key MTrP but dry needling at a satellite MTrP (Srbely et al., 2010). A single case report described the successful suppression of severe myofascial pain in the upper trapezius muscle by remote dry needling of MTrPs in the ipsilateral forearm and hand muscles (Tseng et al., 2008). Recently, it has been also reported that the irritability of a proximal MTrP of upper trapezius muscle can be reduced after dry needling at a distal MTrP in the extensor carpi radialis longus muscle in patients (Tsai et al., 2010). In addition, several studies have also revealed that dry needle-evoked inactivation of a key MTrP can suppress activity in satellite MTrPs situated in its zone of pain referral (Hong, 2006; Hong and Simons, 1993; Hsieh et al., 2007; Lewit, 1979). It appears that remote effect of dry needling can occur either from distal to proximal or from proximal to distal.

In acupuncture therapy, similar remote effectiveness in pain control has been documented (Carlsson, 2002; Chou et al., 2009; Rho et al., 2008). The effects of acupuncture may also spread to the contralateral side (Miura et al., 2007). Studies of acupuncture needle stimulation in anesthetized animals have identified a wide variety of reflex responses in remote modification of various organ functions (Sato et al., 2002 ). However, although clinical and experimental evidence of the remote influences of dry needling and acupuncture have been reported in various studies, its underlying neuronal control mechanism remains unclear and still needs to be further investigated using the animal study.

The animal model with myofascial trigger spots (MTrS, similar to human MTrP) has been well established previously (Chen et al., 2008 ; Hong and Torigoe, 1994) . In this study, it is used to investigate the neural control mechanism of remote effect after dry needling at distal MTrS further. A recent study has also found that the changes in EPN

amplitude was significantly correlated with the changes in MTrP irritability (Chou et al., 2009). Thus, the EPN amplitude can be used as an indicator for the irritability in the MTrS region in the study on the spinal neural pathways and mechanisms of remote effects of dry needling. This remote effect may depend on whether or not the control neural circuits (including afferent corresponding spinal segments and higher spinal segments) are intact.

The present study has three main aims. Initially (the 1st year study), we aim to determine whether dry needling stimulation to a distal MTrS at gastrocnemius (GAS) muscle can influence the irritability of a proximal MTrS at biceps femoris (BF) in anesthetized rabbits. Next (the 2nd year study), we aim to determine peripheral afferent pathways involved in this responses by transection of tibial nerve (denervation of GAS). Finally (the 3rd year study), we examined the possible contribution of spinal cord at different levels to the responses of proximal MTrS irritability elicited by dry needling into distal MTrS by transection of lumbar segments (corresponding to BF innervation) and thoracic segments (supra-segment of BF innervation).

## MATERIALS AND METHODS

### *General design*

To investigate the needling-induced remote effects on MTrS irritability (assessed with EPN amplitude changes in the eletromyographic recordings) at BF muscle (i.e., proximal-muscle recording), the effects were examined before, during and after dry needling at the MTrS of ipsilateral or contralateral GAS muscle (i.e., distal-muscle stimulation) in anesthetized animals (the 1st study). Animals in each group were divided further into experimental and control subgroups. In the control animals, sham needling was performed without special needling manipulation as performed in the experimental animals. Continuous tracings of EPN were recorded from BF throughout the entire experimental periods (before, during, and 3 min after dry needling). Control animals were treated with sham needling. Figure 1 demonstrates the procedure of this study.

### *Animal care*

The experiments were performed on adult New Zealand rabbits (body weight of 2.5–3.0 kg). Each animal was housed individually in a standard polycarbonate tub cage lined with wood chip beddings, and had free access to food and water. The cage was placed in an air-conditioned room (25±1 °C), with 40 dBA and 12 h alternating light-dark cycle (6:00 a.m. to 6:00 p.m.). The ethical guidelines of the International Association for Study of Pain in animals were followed (Zimmermann, 1983). All animal experiments were conducted with the procedure approved by the Animal Care and Use Committee of a university in accordance with the Guidelines for Animal Experimentation.

### *Experimental groups, subgroups, and controls*

Animals in each group were randomly divided further into four subgroups based on the condition of treatment on GAS: ipsilateral dry needling (n=8), contralateral dry needling (n=8), ipsilateral sham needling (n = 4), and contralateral sham needling (n = 4). Sham needling was performed with insertion of needle into GAS without the special manipulation of the needle.

### *Animal preparation*

Before anesthesia, the most tender spots (i.e., MTrS) of BF and GAS were identified

by finger pinching. The animal's reaction to the pinch stimulation were observed (withdrawal of the lower limb, turning its head, screaming, etc) to confirm the exact location of an MTrS. These painful regions were marked on the skin with an indelible marker and were designated for electrophysiological assessment or dry needling. The animals were anesthetized with 2% isoflurane (AErrane, Baxter Healthcare Corp., PR, USA) in oxygen flow for induction followed by a 0.5% maintenance dose (Wood, 1984). Body temperature was monitored by a thermistor probe of a thermometer (Physiotemp Instrument, Clifton, NJ, USA) in the rectum and maintained at approximately 37.5 °C using a body temperature control system consisting of thermostatically regulated DC current heating pad and an infrared lamp. The hind limbs of anesthetized rabbits were shaved and cleaned with povidone-iodine solution. The skin of the lateral thigh in one randomly selected side was incised to expose the BF, which served as an EPN recording site. The marked spot region in the BF muscle was grasped between two fingers from behind the muscle and the muscle palpated by gently rubbing (rolling) it between the fingers to discover a taut band. A taut band felt like a clearly delineated "rope" of muscle fibers and was roughly 2–3 mm or more in diameter. The fibers of the taut band were unmistakably firmer in consistency than the surrounding muscle.

## *Dry needling manipulation*

All needling procedures were performed by the same investigator. Dry needling stimulation was performed with a disposable 30G acupuncture needle (300 μm in diameter, 1.5 inches in length, Yu-Kuang Industrial Co., Ltd., Taiwan) at ipsilateral or contralateral GAS (Figure 2). Each needle is individually packed. The technique of dry needling was similar to that suggested by Hong (Hong, 1994a; Hong, 1994b, d; Hong and Torigoe, 1994; Simons et al., 1999) with multiple needle insertions to elicit R-LTRs as much as possible. For needling in MTrS of GAS, the needle was first inserted through the skin perpendicularly at the center of the marked spot and advanced slowly and gently into the muscle until the needle tip touched the bone surface to estimate the thickness of the muscle. The needle was withdrawn back to the subcutaneous layer, and rapidly moved in and out for insertion of multiple sites in different directions (in a cone shape with the center at the initial needle insertion of a perpendicular direction, and the angle of the cone margin was about 20°). For each needle insertion, the needle was advanced into the depth near the bone surface. Simultaneous needle rotation was performed to facilitate fast "in-and-out" needle movement as suggested by Chou et al. (Chou, et al., 2009) in order to elicit as many LTRs as possible. LTRs, when elicited, could be palpable (feeling of muscle twitch) and sometimes visible in the MTrS region.

## *Recording of endplate noise*

### 1. Electromyography setting

For EPN assessment, a two-channel digital EMG machine (Neuro-EMG-Micro, Neurosoft, Ivanovo, Russia) and monopolar needle electrodes (37 mm disposable Teflon-coated model, 902-DMF37-TP; VIASYS/Cardinal Healthcare, Dublin, OH, USA) were used. The gain was set at 20μV per division for recordings from both channels. Low-cut frequency filter was set at 100 Hz and the high-cut at 1,000 Hz. Sweep speed was 10 ms per division. The search needle for EPN recording was inserted into the MTrS region and connected to the first channel of the EMG machine. The control needle was inserted into the non-taut band region near the MTrS in the same muscle and connected to the second channel. A common reference needle electrode for each channel was placed on

the incised skin and connected to both channels via a y-connector.

**2. Search for endplate noise**

This procedure was performed by an investigator who was blind to the group assignment. The search needle was inserted into the MTrS region in a direction parallel to the muscle fibers at an angle of approximately 60° to the surface of the muscle. After initial insertion just short of the depth of the MTrS or to a comparable depth in the case of control sites, the needle was advanced very slowly with simultaneous slow rotation to prevent it from 'grabbing' and releasing the tissue suddenly to advance in a large jump. Each advance was of minimal distance (~1 mm). When the needle approached an active locus (EPN locus), the continuous distant electrical activity, i.e., EPN, can be heard. A site was an active locus when EPN was identified if: (1) EPN-like potentials persisted continuously for more than 3000 msec, (2) the potentials had an amplitude of >10 μV (more than twice the instrumentation noise level of 4 μV observed in control recordings taken at the beginning and at completion of each track), and (3) the adjacent control channel was not recording potentials greater than the instrumentation noise level. As soon as the EMG activity (EPN) with amplitude higher than 10 μV can be recorded, the examiner stopped moving and kept the needle in place to ensure that this EPN can run continuously on the recording screen with constant amplitudes. Continuous EPN tracing was recorded throughout the entire course of the needling treatment (either dry needling or sham needling) and provided the opportunity for continuous visual observation of EPN changes on the EMG screen. The entire EPN tracing found in MTrS of BF were recorded for the analysis of amplitude changes.

**3. Measurement of the amplitude of endplate noise**

Five randomly selected samples of EPN recordings (10 msec each) were taken before, during, and 3 min after the completion of the needling treatment for all groups. The mean amplitude of EPN was analyzed and calculated through the embedded software in the Neuro-EMG-Micro equipment.

### *Date analysis*

Data were expressed as the mean ± standard error of the mean (SEM). The differences in EPN amplitude during different time courses in each group were carried out using a repeated measure of ANOVA followed by a Bonferroni post-hoc analysis. The differences in EPM amplitudes at each time course (before, during, and after needling) among four subgroups (dry needling at ipsilateral and contralateral GAS, and sham needling at ipsilateral and contralateral GAS) were analyzed using two-way ANOVA (side x time) followed by a Bonferroni post-hoc analysis for each group. A p value of $<0.05$ was considered to be statistically significant. All data was analyzed using SPSS ver. 12.0 for Windows.

## RESULTS

### *Stability of EPN amplitudes before treatment*

For each rabbit, 10 min serial of the EPN amplitude recorded from the MTrS of BF was monitored and 10 samples were taken every 60 seconds at the beginning of the experiment, before any dry needling stimulation and surgery. There were no significant differences in EPN amplitudes among data taken at different recording times (repeated measures of ANOVA, $F= 0.27$, $P>0.05$, Figure 3A). Figure 3B shows an example of a typical EMG activity recorded from MTrS of BF (EPN in the top tracing) and recorded

from the control needle which was inserted into the non-taut band region near the MTrS in the same muscle (baseline activity in the bottom tracing). The mean EPN amplitude at the last recording (at 10 min) measured before each treatment was 17.72 ±0.24μV (n = 96, range of 16.90 to 18.65μV).

### *Effects of dry needling of distal MTrS in intact rabbits*

The serial alterations of the mean EPN amplitude before, during, and after dry needling at ipsilateral and contralateral GAS for Group I are demonstrated in Figure 4. Before needling treatment, there was no significant difference among the four subgroups treated differently with dry or sham needling at ipsilateral side or those at contralateral side (two-way ANOVA, $F=0.10$, $P>0.05$). However, significant differences were found among the subgroups during dry needling (two-way ANOVA, $F=5.47$, $P<0.05$) and after needling manipulation (two-way ANOVA, $F=5.68$, $P<0.05$) as described in detail below.

**1. Dry needling at ipsilateral GAS**

In Group I, the mean amplitudes of EPN recorded from BF before, during, and after dry needling at ipsilateral GAS were 18.20±0.70μV, 27.71±0.47μV, and 13.15±0.59μV, respectively. The mean EPN amplitudes recorded before, during, and 3 min after dry needling treatment were significantly different (repeated measures of ANOVA, $F=45.99$, $P<0.05$). Compared with the data in the pre-needling level, the EPN amplitudes were significantly increased during the dry needling treatment (Bonferroni post-hoc test, $P<0.05$), and then significantly decreased to a much lower level after completion of the needling treatment (Bonferroni post-hoc test, $P<0.05$) as shown in Figure 4. However, these serial alterations of EPN amplitudes were not found in the comparable sham needling subgroup (repeated measures of ANOVA, $F=0.026$, $P>0.05$). There were significant differences in EPN amplitudes recorded either during or after needling between dry needling and sham needling subgroups (Bonferroni post-hoc test, $P<0.05$).

**2. Dry needling at contralateral GAS**

The mean EPN amplitudes (±SEM) recorded from BF before, during, and after dry needling at contralateral GAS were 17.96±0.69μV, 24.66±1.47μV, and 14.01±0.86μV, respectively. Figure 4 shows that the mean EPN amplitudes recorded before, during, and 3 min after dry needling treatment were significantly different (repeated measures of ANOVA, $F=113.98$, $P<0.05$). There was a significant increase in the mean EPN amplitude during the needling treatment (Bonferroni post-hoc test, $P<0.05$), and a significant decrease after needling treatment (Bonferroni post-hoc test, $P<0.05$) compared to the pre-needling level. These serial alterations of EPN amplitudes were not found in the comparable sham needling subgroup (repeated measures of ANOVA, $F=0.026$, $P>0.05$). There were significant differences in EPN amplitudes recorded either during or after needling between dry needling and sham needling subgroups (Bonferroni post-hoc test, $P<0.05$). In addition, alterations in ENP amplitudes in response to dry needling at contralateral GAS were similar to those at ipsilateral GAS. The magnitude or time-dependent alteration of EPN amplitude following dry needling of GAS at the contralateral side was not significantly different from that at the ipsilateral side (Bonferroni post-hoc test, $P>0.05$).

## DISCUSSION

To our knowledge, the present study is the first animal study to investigate the neural mechanism of the remote effects of dry needling. In this study, we found that an intact afferent nerve from the remote stimulation site and normal spinal cord segments

corresponding to the innervation of the affected proximal muscle are essential for the remote effect from either ipsilateral or contralateral stimulation.

### *Technical issues on dry needling*

The dry needling used in this study is a technique of MTrP injection with multiple high-speed needle insertions into different loci in an MTrP region suggested by (Hong, 1994a; Hong, 1994c)). High speed needling can provide high-pressure stimulation to the sensitive loci in the MTrP region to elicit LTRs. It is essential to elicit LTRs during needling of an MTrP in order to obtain immediate and complete pain relief (Hong and Simons, 1998; Hong, 2006; Hong, 2008). Dry needling at the MTrS was effective in diminishing spontaneous electrical activity (i.e., EPN) of MTrS of rabbit skeletal muscle if LTRs were elicited (Chen et al., 2001). After several LTRs had been elicited by the needling of an MTrS of rabbit skeletal muscle, no more LTRs could be elicited from the same region (Hong and Torigoe, 1994) and the irritability of the MTrS could be suppressed (Chen et al., 2001). Needling-elicited LTRs are involuntary discharges of muscle fiber mediated through the nervous system and integrated at the spinal cord level (Hong and Torigoe, 1994; Hong et al., 1995). Therefore, it is important to apply this needling technique to achieve the best needling effect or remote needling effect for the study on the neural mechanism.

### *Electrophysiological confirmation of the remote effect in normal neural circuits*

Changes in the EPN amplitude in the MTrS region of the BF were found during and after dry needling at the distal MTrSs in the group with intact neural circuits (Group I). These electrophysiological findings demonstrate that dry needling to MTrSs of distal muscles (either ipsilateral or contralateral GAS) could initially increase the irritability of MTrS in the proximal muscle (BF), followed by a suppression effect after cessation of needling. In a recent human study, Fernandez-Camero, et al. (Fernandez-Carnero et al., 2010a) also found an increase in spontaneous electrical activity at an MTrP region during a persistent noxious stimulation (a bolus injection of glutamate) at another MTrP in a distant muscle, followed by a suppression of electrophysiological irritability after cessation of dry needling (elimination of nociceptive inputs). The two findings above strongly support clinical observations related to the interaction between a key-primary MTrP and its satellite-secondary MTrPs in the muscles located in the region of the referred pain (referred zone) of a key MTrP (Hsieh et al., 2007).

## CONCLUSION

As demonstrated this study, the irritability of MTrSs at BF (proximal MTrS) could be modulated by the remote effect of dry needling either ipsilateral or contralaterally at MTrS of GAS (distant MTrSs). However, influences from higher spinal and supraspinal levels such brainstem and midbrain structures involved in the descending pain inhibitory system still requires further investigation.

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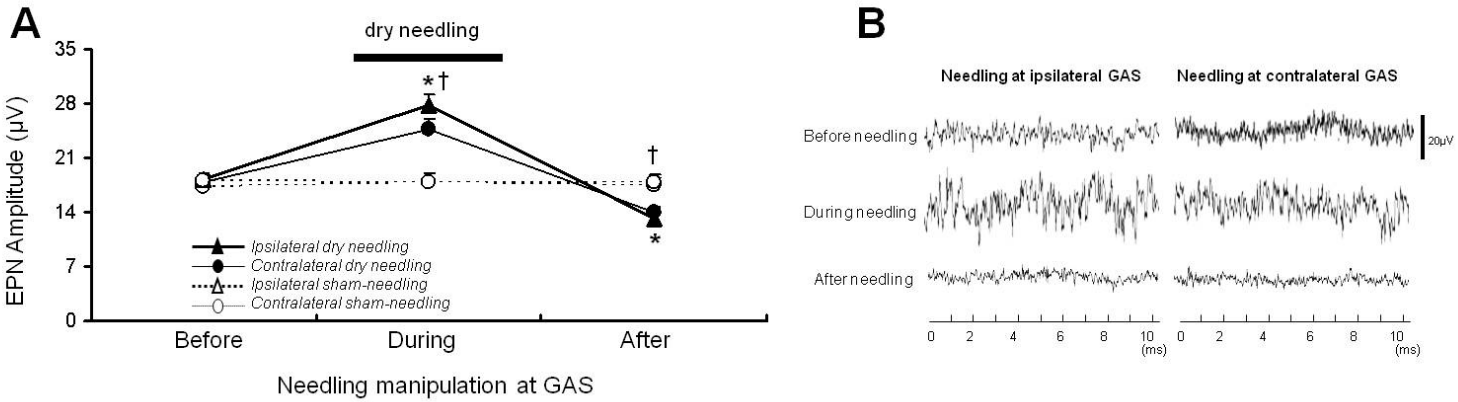
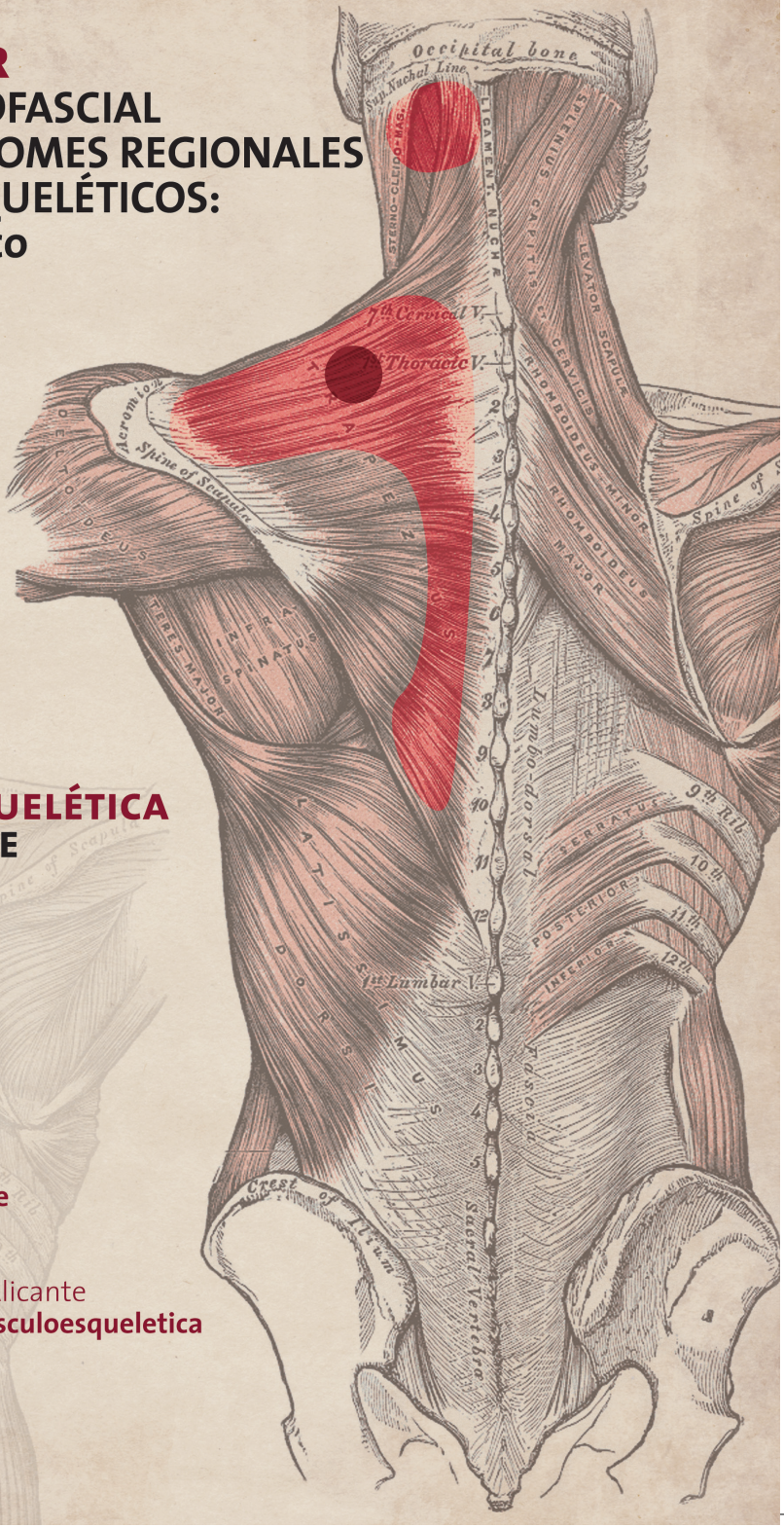



**Fig 1.** A series of changes in the EPN amplitude measured at MTrS of biceps femoris before, during, and after dry needling manipulation at gastrocnemius (GAS) in the Group I. (A) Time course of EPN amplitude. (B) Sample recordings of EPN responses in two rabbits of Group I. †: P<0.05, showed significant differences among the four subgroups. *: P<0.05 showed the significant differences compared to the values at pre-needling level in subgroups with dry needling at ipsilateral and contralateral GAS.

心得報告

本人在抵達會場後，先於大會服務台取得通行證後，正式接受一場科學的盛會的洗禮。這次的會議有眾多來自世界各地的生物學家及醫師參與，大會每天安排了許的大大小小不同主題的研討會、看板論文、參展的場商也有百家之眾，其中也包含知名科學期刊雜誌的展出、與會的生技廠商也舉辦多場實用的實驗講解，因此在整個會場不但可以與各國學者分享實驗的想法及成果外也，可以對當下最先進的實驗輔助器材有所瞭解。在為期 5 天的大會裡我參加了多場的研討會，這次的大會真是令我獲益非淺。

# CURSO-TALLER
# EL DOLOR MIOFASCIAL EN LOS SINDROMES REGIONALES MUSCULOESQUELÉTICOS: Enfoque Clínico




# IV JORNADA DE MEDICINA MUSCULOESQUELÉTICA 2010 ALICANTE

## PROGRAMA PRELIMINAR

**29 y 30 de Septiembre**
**1 de Octubre**
Aula de Docencia,
Hospital General de Alicante
**www.geyseco.es/musculoesqueletica**


SECRETARÍA TÉCNICA
GEYSECO.es
TEL 902 369 497
FAX 902 369 498
EMAIL musculoesqueletica@geyseco.es

## PRESENTACIÓN

### Fundamentos del Curso

Los síndromes dolorosos regionales musculoesqueléticos más conocidos se asocian con frecuencia a dolor y disfunción miofascial (SDM). El hallazgo de puntos gatillo (PG) permite enriquecer la semiología clínica, perfilar diagnósticos complementarios a los más clásicos y establecer nuevos objetivos terapéuticos mediante procedimientos específicos miofasciales.

El dominio de las habilidades clínicas necesarias para reconocer, identificar y tratar el dolor regional desde el punto de vista miofascial, permite enriquecer la práctica clínica cotidiana y puede ayudar a mejorar los resultados terapéuticos.

### Objetivos

· Conocer los avances en la fisiopatología y el diagnóstico del SDM;
· Aprender los criterios diagnósticos generales del SDM;
· Conocer los SDM asociados a los dolores musculoesqueléticos más frecuentes;
· Aprender las habilidades palpatorias para discriminar los PG, la banda tensa y la respuesta de espasmo local;
· Conocer los patrones de dolor referido miofascial, cervical y lumbar;
· Aprender la ruta del diagnóstico clínico miofascial;
· Conocer los procedimientos terapéuticos miofasciales;
· Aprender las técnicas básicas de infiltración miofascial, con punción seca, anestésico local o toxina botulínica.

### Técnicas y Procedimientos

Las técnicas y procedimientos que se aprenderán durante el curso:

**Punción seca:** Trapecio, esplenios, angular, romboides, multifido, logisimos, cuadrado lumbar, glúteos, TFL, piramidal. Técnicas de Hong y de Baldry , As shi points).

**Infiltración con toxina botulínica:** Trapecio, angular, cuadrado lumbar, glúteo, piramidal, fascia plantar.

**Infiltración miofascial anestésica con la técnica de Hong.**

Se introducirán técnicas colaborativas:

**Liberación miofascial:**
· Compresión
· TINI
· Técnicas postisométricas

**Técnicas articulares:**
· Rotación sacra
· Iliaco anterior
· Iliaco posterior

**Ejercicios postisométricos**

## PROFESORES

**Prof. Dr. Chang Zern Hong**
*Physical Medicine & Rehabilitation.*
*University of California. Irvine. USA.*
*Taichung University. Taiwan.*

**Dr. José M. Climent**
*Servicio de Rehabilitación. Hospital*
*General Universitario de Alicante.*

**Dr. Pedro Fenollosa**
*Unidad del Dolor Hospital La Fe. Valencia.*

**Dr. Ismael Díaz**
*Servicio de Rehabilitación. Hospital*
*General Universitario de Alicante.*

**Dr. César Margarit**
*Unidad del Dolor. Hospital General*
*Universitario de Alicante.*

**Dr. Gerardo Pastor**
*Servicio de Rehabilitación. Hospital*
*General Universitario de Alicante.*

**Dr. Vicente Marimón**
*Servicio de Rehabilitación. Hospital*
*General Universitario de Alicante.*

## PROGRAMA PRELIMINAR

### MIERCOLES, 29 DE SEPTIEMBRE DE 2010

| | |
|---|---|
| 08h45 — 11h00 | **Introducción al síndrome. Actualización fisiopatológica. Consenso sobre los criterios diagnósticos** |
| 11h00 — 11h30 | **Descanso** |
| 11h30 — 12h00 | **Patrones de dolor referido** |
| 12h00 — 13h00 | **Taller de exploración general** |
| 13h00 — 14h00 | **Dolor cervical: enfoque miofascial** |
| 14h00 — 16h00 | **Descanso** |
| 16h00 — 17h00 | **Diagnóstico miofascial en el contexto de los síndromes cervicales** |
| 17h00 — 17h30 | **Descanso** |
| 17h30 — 20h00 | **Taller de exploración e infiltraciones: región cervical** |

### JUEVES, 30 DE SEPTIEMBRE DE 2010

| | |
|---|---|
| 08h45 — 11h00 | **Prácticas clínicas: exploración e infiltración.** |
| 11h00 — 11h30 | **Descanso** |
| 11h30 — 14h00 | **Dolor lumbar y pélvico: enfoque miofascial.** |
| 14h00 — 16h00 | **Descanso** |
| 16h00 — 17h00 | **Diagnóstico miofascial en el contexto de los síndromes lumbo-pélvicos** |
| 17h00 — 17h30 | **Descanso** |
| 17h30 — 19h00 | **Taller de exploración e infiltraciones: región lumbar** |

### VIERNES, 1 DE OCTUBRE DE 2010

| | |
|---|---|
| 08h45 — 11h00 | **Workshop on myofascial pain** |
| 11h00 — 11h30 | **Descanso** |
| 11h30 — 13h00 | **Fascitis plantar: enfoque miofascial** |
| 13h00 | **Conferencia Magistral, abierta al público: New trends on Myofascial Pain**<br>**Dr. Chang Zern Hong** |

## INFORMACIÓN GENERAL

### Fechas
29 y 30 de Septiembre y 1 de Octubre 2010.

### Sede
Aula de Docencia Hospital General de Alicante.
Pintor Baeza s/n 03010 Alicante.

### Horas
20 horas

### Dirigido a
Médicos residentes de Medicina Física y Rehabilitación o Anestesia y Reanimación.
Médicos especialistas interesados en el dolor musculoesquelético.

### Plan del curso
Clases teóricas
Talleres prácticos de exploración
Asistencia clínica
Talleres de infiltración

### Inscripciones
La cuota de inscripción incluye la asistencia a cursos-taller, la documentación oficial del congreso, los cafés, comida de trabajo y traducción simultánea.
Será imprescindible para acceder a las sesiones científicas disponer de la acreditación que se entregará con la documentación. Las inscripciones pueden realizarse desde la página web: www.geyseco.es/musculoesqueletica

### Cuota de Inscripción
350 €
7% de i.v.a. no incluído. 8% a partir del día 1 de Julio de 2010.

### Forma de Pago
**Tarjeta de Crédito:** Las inscripciones y reservas pueden abonarse mediante tarjeta de crédito rellenando el boletín de la página web del congreso o enviando el boletín adjunto cumplimentado y firmado al fax: 902 369 498
**Transferencia Bancaria:** Las inscripciones y reservas pueden abonarse mediante transferencia bancaria a la cuenta de La Caixa: 2100 3461 46 22 00029803. Deberá remitir el boletín de inscripción junto con la transferencia al fax: 902 369 498.

### Cancelaciones
Con posterioridad al 29 de agosto no se aceptará ningún cambio o anulación en las inscripciones efectuadas. Cualquier anulación hecha con anterioridad a esta fecha tendrá unos gastos de gestión del 50%. Todas las cancelaciones deberán ser remitidas a la Secretaría Técnica por escrito. El reembolso de los servicios anulados se efectuará a partir del 29 de octubre de 2010.

### Secretaría Técnica
Grupo Geyseco, S.L.
TEL 902 369 497
FAX 902 369 498
E-MAIL musculoesqueletica@geyseco.es
www.geyseco.es/musculoesqueletica

## BOLETIN DE INSCRIPCIÓN

### DATOS PERSONALES

**Apellidos** .....
**Nombre** .....
**Dirección** .....
..... **C.P.** .....
**Población** ..... **País** .....
**E-mail** .....
**Titulación académica** .....
**Centro de trabajo** .....

### CUOTAS DE INSCRIPCIÓN

☐ **350€**

**7% I.V.A. NO INCLUIDO,**
**8% A PARTIR DEL 1 DE JULIO**

### FORMA DE PAGO

☐ Autorizo a cargar en mi tarjeta de crédito el importe total del Boletín
☐ VISA ☐ Mastercard
Nombre del titular .....
N.º Tarjeta .....Fecha de Caducidad .....
Firma .....

☐ Transferencia bancaria: 2100 3461 46 22 00029803 por _____€
(imprescindible enviar copia de la transferencia y boletín al fax: 902 369 498 y ).

# MYOPAIN 2010 [128285]

## Advance Registration Form

Registration form must be postmarked by SEPTEMBER 3, 2010 to qualify you for Advance Fees.

Please refer to and complete fee schedule below
**Please type or print legibly**

Name_____
Degree_____
Telephone_____
FAX_____
E-mail_____
Profession/Specialty_____
Address_____
City, State, Country_____
Zip or Postal Code_____
Do you have special requirements? _____Yes _____No


*[If yes, you will be contacted by the CME Staff to see how we can assist.]*

## Accompanying Guests Information

Names

_____
_____
_____
_____

## Registration Instructions

**Four Easy Ways to Register -**

**1. Online: http://cme.uthscsa.edu/coursecatalog.asp**
Visit our website, choose MYOPAIN '10 and follow instructions.

**2. By Fax: 1-210-567-6964**
Complete the registration form and include credit card payment information. We accept Visa, MasterCard, Discover, and American Express.

**3. By Mail:** Mail your completed registration form & payment [payable to "UTHSCSA-CME 128285"] to: The University of Texas Health Science Center at San Antonio, MSC 7980 - Continuing Medical Education, 7703 Floyd Curl Drive, San Antonio, TX 78229-3900

**4. By Phone: 1-210-567-4446 or call [toll-free] 1-866-601-4448.** Please have your information ready as requested on the registration form and credit card information to expedite process.

Registrations received by September 24, 2010, are confirmed by email. If you do not receive a confirmation, call 1-210-567-4446, 1-866-601-4448 [toll free] or send email to cme@uthscsa.edu.

Enclosed is my check for $_____in US currency.
**Checks must be in US funds, drawn on a US bank** and made payable to: UTHSCSA-CME #128285
Charge $_____
to my _____VISA _____ MasterCard
_____ Discover _____ AMEX

Card Number_____
Expiration Date_____
Name as it appears on card _____

Card holder's signature _____

**Forms Without Payment Will Not Be Processed**

## Type of Registration/Fee Categories

| | Advance Fees Postmarked by September 3, 2010 | After September 3, 2010 or On-Site | Circle Session | | Totals |
|---|---|---|---|---|---|
| **Scientific/Poster Sessions** IMS Active Member [Dues Paid 2010] * | $545 | $600 | | | _____ |
| **Scientific/Poster Sessions** Non-Members/Others | $630 | $685 | | | _____ |
| **Fibromyalgia Workshop** Thursday, October 7, 2010 A1 8 am-9:30 am A2 9:45 am-11:15am | $ 60 **[Session A2 is a repeat of Session A1]** | $ 70 | A1 | A2 | _____ |
| **Myofascial Workshop** Thursday, October 7, 2010 B1 8 am-9:30 am B2 9:45 am-11:15 am | $ 60 **[Session B2 is a repeat of Session B1]** | $ 70 | B1 | B2 | _____ |

**Fees for Guests**

Opening Reception
Number of guests _____ x $15 = _____

de las Mercedes el cigarral Dinner Event
Total Count for yourself and Number of guests _____ x $125 = _____

**TOTAL Fees Enclosed** **TOTAL FEE** $_____

* Become an IMS Member in time to take advantage of lower conference registration fees! You may apply at the IMS Website: www.myopain.org

### Payment of Full Scientific Registration Fee Entitles You To:

- Name Badge/Attendee Materials
- Entrance to Plenary, Scientific, and Poster Sessions [excluding workshops which require separate fees]
- Welcome Reception
- Refreshment Breaks and Lunches [Monday-Wednesday]

### Payment of Reception or Dinner Fee[s]

Guest Fees do **not** include attendance at Scientific Sessions, Refreshment Breaks, and Lunches. Tickets will be issued:
For guests - Opening Reception
For all - Dinner Event

# SOCIAL EVENTS

## Welcome Reception
On Sunday evening, October 3, 2010, a Welcome Reception at the Beatriz Hotel will take place from 7:30 to 9:00 p.m.

## De Las Mercedes El Cigarral Por Excelencia [Additional Fee]
You haven't experienced one of the most exceptional venues in Toledo, until you experience the de las Mercedes el cigarral por excelencia.
On Tuesday evening, October 5, 2010 congress attendees and their guests will have an opportunity to enjoy this venue. A few minutes from the center of Toledo there is this magnificent dining establishment built with much effort, imagination, and creativity. An old cigarral [country house] area has been transformed into an area of great natural beauty with stunning views - boasting the best views of the city. Upon this property overlooking Toledo we will be served a welcome drink [outside - weather permitting] and we will be able to view the lights of the city in this pleasant and relaxed atmosphere. A gourmet meal will be served inside the exquisite restaurant site.
Join your fellow attendees and their guests for an unforgettable evening at the de las Mercedes el cigarral por excelencia. We will depart on buses from the lobby of the Beatriz Hotel and return to the Beatriz.

## Toledo, Spain On Your Own
Free time during the meeting will allow you to explore the Toledo, Spain area on your own. Consider spending some pre-or post Congress vacation time in this world heritage site city. For additional information, visit this website: www.t-descubre.com.

## Food Service
Your congress registration fee provides morning and afternoon coffee and a luncheon buffet. These will be offered daily Monday-Wednesday for scientific registrants only.

## Weather
August temperatures range from 50F to 66F
[or 10C to 19C]

## Official Congress Language
The official language for the Congress and all scientific, poster, and commercial presentations is English.

# Registration Information Deadline/Advance Registration

**Postmarked by September 3, 2010**
Everyone must register. Discounts for advance registration will end on **September 3, 2010**. See registration form for fees, policies, and instructions.

Registrants must pay registration fees with credit cards [VISA, MasterCard, Discover, or AMEX], checks in US funds, or US bank money orders.

## Registration Confirmation
will be mailed. If you have not received your confirmation by September 24, 2010 please call the CME office at 1-210-567-4446, 1-866-601-4448 [toll free], or e-mail cme@uthscsa.edu. Confirmation will include your registration receipt[s]. NO REFUNDS AFTER September 23, 2010. All refund requests must be received in writing prior to September 23. Request must include the registration receipt[s]. Refunds are subject to a $50.00 processing fee. Please allow 30 days for refund processing. There will be no refunds for workshops.

## Hotel Accommodations
A block of rooms has been reserved at the site of the MYOPAIN 2010 conference, the Hotel Beatriz, Carretera de Avila, km 2,750, 45005 Toledo, Spain. Conference rates are available these dates: September 30-October 9, 2010. The deadline for guaranteed hotel rates is September 15, 2010. Hotel reservations received after this cutoff are subject to rate and space availability. **Please make your reservations directly with the hotel by going to the following website and following the directions given. www.beatrizhoteles.com/en/myopain.html**

## Conference Check-In
Check-in and site registration will begin Sunday, October 3, 1:00 p.m. – 7:30 p.m. Thereafter, the Congress registration desk hours will be 7:30 a.m. – 5:30 p.m. Monday through Wednesday, and 7:30 a.m. – 1:00 p.m. on Thursday. The name tags for scientific registrants must be worn for admittance to congress sessions and congress meals.

## Transportation
Please Google the phrase: Travelling to Toledo - and then click on that exact phrase where it appears. Here you will find comprehensive information regarding travel to Toledo from the Madrid Barajas International Airport [MAD], the closest airport to Toledo. [Prices listed are dated and will differ minimally from current prices.]

## Terms And Conditions Of Attendance
As a registered attendee of the Eighth World Congress on Myofascial Pain Syndrome and Fibromyalgia Syndrome, you agree:

- to assume full risk and responsibility for all bodily injury [including personal injury or death] or damage to your personal property that may arise or be sustained during your participation in this event.
- to waive and release the International MYOPAIN Society [IMS] and its representatives, directors, officers, employees, agents, successors and assigns [collectively, "Released Parties"] from any and all claims, demands, injuries, damages, actions, and causes of action, whatsoever, and from any and all liability for any loss of property or property damage, or personal injury of any kind, nature or description, including death, that may arise or be sustained during participation in the referenced event.
- to hold the Released Parties free and harmless from any and all claims, demands, injuries, actions, suits, or causes of action whatsoever arising out of or in any way connected with the participation in the Eighth World Congress on Myofascial Pain Syndrome and Fibromyalgia Syndrome.

# International Myopain Society [IMS]

# Eighth World Congress on Myofascial Pain Syndrome and Fibromyalgia Syndrome

October 3-7, 2010
Hotel Beatriz
Toledo, Spain

Registration Information

**Abstract Deadline**
**May 3, 2010**
**Electronic Submission Only: www.myopain.org**

UT Health Science Center San Antonio
Continuing Medical Education - MC 7980
7703 Floyd Curl Drive
San Antonio, TX 78229 - 3900 USA

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# WELCOME TO TOLEDO, SPAIN: A WORLD HERITAGE SITE

The International MYOPAIN Society's Congress Program Committee, its Board, its Officers, and the Department of Continuing Medical Education at the UT Health Science Center San Antonio School of Medicine welcome you to the Eighth World Congress on Myofascial Pain Syndrome and Fibromyalgia Syndrome. Like its predecessors in Minneapolis, Minnesota; Copenhagen, Denmark; San Antonio, Texas; Silvi Marina, Italy; Portland, Oregon; Munich, Germany, and Washington, D.C., the 2010 meeting in Toledo, Spain promises to provide new information about myofascial pain syndrome, fibromyalgia syndrome, and other similar syndromes.

The MYOPAIN 2010 Congress will provide an intense learning experience of basic and clinical science with respect to fibromyalgia syndrome and myofascial pain syndrome. The abstract presentations will include all aspects of these and other soft tissue pain disorders. Presentations will feature the latest clinical findings, new forms of treatment, and new ideas for future research. This congress will be of direct interest to physicians, dentists, researchers, physical therapists, and other health care professionals working in this important field.

In addition to the broadly based scientific program, there will be a Myofascial Pain Syndrome Workshop and a Fibromyalgia Syndrome Workshop. There will also be special social events for participants and their guests.

There is something for everyone in beautiful historic Toledo!

Toledo, Spain, a World Heritage Site, is known as the city of three cultures with an impressive natural rock fortress, surrounded by walls and the river Tagus. It is the modern regional capital of Castilla-La Mancha.

Toledo is a must for art lovers. The city is rich in aesthetic details, and displays a valuable heritage of art and buildings. The three cultures that lived together in Toledo: Christians, Arabs, and Jews, enabled the city to reach its cultural peak in the Middle Ages. 'El Greco' stands out among its many illustrious artists, and it is the land of Don Quixote.

Toledo still maintains its heritage of ancient craft guilds, with an immensely rich display of craftwork in its lively market place together with an up-to-the minute range of ultramodern shops. The city has become one of the favorite shopping destinations for international visitors.

The culture of the city is also reflected in its gastronomy. It has fine dining and a lively nightlife. The Tuesday evening dinner event will exhibit that for those that choose to join us at the de las Mercedes el cigarral por excelencia for an unforgettable evening dining experience.

Toledo is easily accessed from the Madrid Barajas International Airport [MAD] - or by the numerous rail lines throughout Europe. Upon landing in Madrid, Toledo is 44 miles south of Madrid - by car. Alternatives include high speed train, bus, or taxi. MYOPAIN 2010 will be held at the Beatriz Hotel, Toledo with its amazing views of the historical center of the Imperial City.

# SCIENTIFIC INFORMATION

## Objectives

MYOPAIN world congresses are dedicated to informational exchange relating to recognition, neurobiology, and management of soft tissue disorders such as myofascial pain and fibromyalgia. MYOPAIN 2010 is planned with this goal in mind, reflecting the needs and interests of members of the medical community providing a forum to address issues of importance for physicians, dentists, researchers, physical therapists, and others working in this important field.

## Accreditation

This activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of The University of Texas Health Science Center at San Antonio [UTHSCSA] School of Medicine and the International MYOPAIN Society. UTHSCSA is accredited by the ACCME to provide continuing medical education for physicians.

UTHSCSA designates this educational activity for a maximum of **16.75** *AMA PRA Category 1 Credits*™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

## Scientific, Poster, Workshop Sessions

The scientific, poster, and workshop sessions will be held at the Hotel Beatriz, Toledo, Spain. The Congress will start Sunday evening, October 3, 2010 and will continue through Thursday afternoon, October 7, 2010.

## Abstracts

DEADLINE: Monday, May 3, 2010. All abstract submissions must be made online at www.myopain.org

# WORKSHOP DESCRIPTIONS [Additional Fee]

## Myofascial Pain Syndrome Workshop

workshop facilitator **Chang-Zern Hong, MD**

**Needle Electromyography as a Gold Standard for the Diagnosis of Myofascial Trigger Points**

Spontaneous electrical activity [SEA] can be recorded from a myofascial trigger point [MTrP] region. SEA consists of low grade continuous electrical activity [endplate noise, EPN] and few sharp spikes [endplate spikes, EPS] with much higher amplitude. EPN is an accumulation of non-propagated miniature endplate potentials as a consequence of excessive release of acetylcholine [not simultaneously], and EPS is propagated action potential generated from the endplate. Recent studies have suggested that the irritability of an MTrP can be assessed with electromyographic study since it is proportional to the prevalence and the amplitude of EPN recorded from that MTrP region.

## Fibromyalgia Syndrome Workshop

workshop facilitator **Sigrid Hørven Wigers, MD, PhD**

**Fibromyalgia Treatment from a Biopsychosocial Perspective**

The biopsychosocial perspective calls for an individualized and multidimensional rehabilitation approach. How to deal with the patient's physical, psychological, and social challenges will be presented in a practical way. The discussion will be based on personal experience from multidimensional treatment of fibromyalgia patients at Jeløy Kurbad and existing evidence-based guidelines. It will include how to provide patients with pertinent information, physical exercise, myofascial pain treatment, and medications, and how to address their cognitions and behavior. The importance of taking into account all the dimensions of a patient's life, as opposed to treating single symptoms only, will be highlighted.

## Exhibits

The exhibits will be open Monday, October 4, 2010 through Wednesday, October 6, 2010. Please take the opportunity to visit the booths and talk to the representatives.

# PRELIMINARY PROGRAM

## Sunday October 3, 2010

| | |
|---|---|
| 1:00-7:30 | Registration |
| 7:30-9:00 | Opening Reception |

## Monday October 4, 2010

Myofascial Pain Syndrome

| | |
|---|---|
| 7:30-5:30 | Registration Continues |
| 8:15-8:30 | Come to Order, Announcements |
| 8:30-9:15 | **Robert D. Gerwin, MD** - Department of Neurology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA<br>**– Presidential Address - The State of Myofascial Pain and Fibromyalgia: Where Do We Stand?** |

9:15-10:00 **Siegfried Mense, Prof. Dr. Med.** - Faculty of Medicine Mannheim, Department of Neuroanatomy, University Heidelberg, Mannheim, Germany - **How do Muscle Lesions such as Active and Latent Trigger Points Influence Central Nociceptive Neurons?**

10:00-11:00 Refreshment Break, Exhibits, Posters

11:00-11:45 **César Fernández-de-las Peas, PT, PhD** - Department of Physical Therapy, University Rey Juan Carlos, Madrid, Spain - **New Evidence for Trigger Point Involvement in Tension - Type Headache**

11:45-12:30 **Kazue Mizumura, MD, PhD** - Department of Neuroscience II, Division of Stress Recognition and Response, Research Institute of Environmental Medicine, Nagoya University, Nagoya, Japan - **Animal Models of Myofascial Trigger Points**

12:30-1:30 Lunch

1:30-2:30 Poster Session # 1 with Presenters and Exhibits

2:30-4:10 **Podium Abstract Presentations**

4:10-5:00 Refreshments, Exhibits, Presenters at Posters

## Tuesday October 5, 2010

**Fibromyalgia Syndrome**

7:30-5:30 Registration Continues

8:15-8:30 Come to Order, Announcements

8:30-9:15 **Jennifer M. Glass, PhD** - Department of Psychiatry, University of Michigan, Ann Arbor, Michigan, USA - **Cognitive Dysfunction in Fibromyalgia Syndrome**

9:15-10:00 **Michael Spaeth, MD** - Private Practice, Internal Medicine /Rheumatology, Graefelfing, Germany - **Fibromyalgia Treatment from a Multidimensional Perspective**

10:00-11:00 Refreshment Break, Exhibits, Posters

11:00-11:45 **Ernest Choy, MD** - King's Musculoskeletal Clinical Trials Unit, King's Health Partners, London, United Kingdom - **Clinical Domains of Fibromyalgia Syndrome: Determination through the OMERACT Process**

11:45-12:30 **Patrick B. Wood, MD** - Pacific Rheumatology Associates, Inc. PS, Renton, Washington, USA - **Imaging in Fibromyalgia Syndrome**

12:30-1:30 Lunch

1:30-2:30 Poster Session # 2 with Presenters and Exhibits

2:30-4:10 **Podium Abstract Presentations**

4:10-5:00 Refreshments, Exhibits, Presenters at Posters

7:00-10:30 Evening Dinner Event [Optional event – by ticket only]

## Wednesday October 6, 2010

**General Muscle Pain**

7:30-5:30 Registration Continues

8:15-8:30 Come to Order, Announcements

8:30-9:15 **Robert Schleip, PhD** - Fascia Research Project, Institute of Applied Physiology, Ulm University, Ulm, Germany - **Biomechanical Properties of Fascial Tissues and Their Role as Pain Generators**

9:15-10:00 **Peter Tiidus, PhD** - Dean of Science, Wilfrid Laurier University, Waterloo, Ontario, Canada - **Skeletal Muscle Damage and Repair**

10:00-11:00 Refreshment Break, Exhibits, Posters

11:00-11:45 **Maria Adele Giamberardino, MD** - Pathophysiology of Pain Laboratory, "G. D' Annunzio University" of Chieti, Italy - **Visceral Referred Pain**

11:45-12:30 **Orlando Mayoral del Moral, PT** - Hospital Provincial de Toledo, Toledo, Spain **– Incoming Presidential Address - Dry Needling Treatments for Myofascial Trigger Points**

12:30-1:30 Lunch

1:30-2:30 Poster Session # 3 with Presenters and Exhibits

2:30-3:50 **Podium Abstract Presentations**

3:50-4:10 IMS Business Meeting

4:10-5:00 Refreshments, Exhibits, Presenters at Posters

## Thursday October 7, 2010

**Workshop Sessions**

7:30-1:00 Registration Continues

8:00-9:30 **Sigrid Hørven Wigers, MD, PhD** - Jeløy Kurbad, Moss, Norway - **Fibromyalgia Treatment from a Biopsychosocial Perspective** [Session A I]

9:45-11:15 Repeat of Session A 1

8:-9:30 **Chang-Zern Hong, MD** - Department of Physical Therapy, Hungkuang University, Tai-Chung, Taiwan - **Needle Electromyography as a Gold Standard for the Diagnosis of Myofascial Trigger Points** [Session B 1]

9:45-11:15 Repeat of Session BI

The best abstracts [as judged by the abstract committee] will be presented in more detail in afternoon plenary sessions. These selections will be posted on the myopain.org website when judging is final.

**Program subject to change**

無研發成果推廣資料

# 99 年度專題研究計畫研究成果彙整表

| 計畫主持人：洪章仁 | 計畫編號：99-2314-B-241-001- |
|---|---|

計畫名稱：探討在遠端肌激痛點做乾針刺激對近端肌激痛點活性之影響的神經通路/一種可能的針灸之神經機制

| 成果項目 | | | 量化 | | | 單位 | 備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等） |
|---|---|---|---|---|---|---|---|
| | | | 實際已達成數（被接受或已發表） | 預期總達成數(含實際已達成數) | 本計畫實際貢獻百分比 | | |
| 國內 | 論文著作 | 期刊論文 | 0 | 0 | 0% | 篇 | |
| | | 研究報告/技術報告 | 0 | 0 | 0% | | |
| | | 研討會論文 | 0 | 1 | 100% | | |
| | | 專書 | 0 | 0 | 0% | | |
| | 專利 | 申請中件數 | 0 | 0 | 0% | 件 | |
| | | 已獲得件數 | 0 | 0 | 0% | | |
| | 技術移轉 | 件數 | 0 | 0 | 0% | 件 | |
| | | 權利金 | 0 | 0 | 0% | 千元 | |
| | 參與計畫人力（本國籍） | 碩士生 | 1 | 0 | 20% | 人次 | |
| | | 博士生 | 0 | 0 | 0% | | |
| | | 博士後研究員 | 0 | 0 | 0% | | |
| | | 專任助理 | 0 | 0 | 0% | | |
| 國外 | 論文著作 | 期刊論文 | 0 | 1 | 100% | 篇 | |
| | | 研究報告/技術報告 | 0 | 0 | 0% | | |
| | | 研討會論文 | 0 | 0 | 0% | | |
| | | 專書 | 0 | 0 | 0% | 章/本 | |
| | 專利 | 申請中件數 | 0 | 0 | 100% | 件 | |
| | | 已獲得件數 | 0 | 0 | 100% | | |
| | 技術移轉 | 件數 | 0 | 0 | 100% | 件 | |
| | | 權利金 | 0 | 0 | 100% | 千元 | |
| | 參與計畫人力（外國籍） | 碩士生 | 0 | 0 | 100% | 人次 | |
| | | 博士生 | 0 | 0 | 100% | | |
| | | 博士後研究員 | 0 | 0 | 100% | | |
| | | 專任助理 | 0 | 0 | 100% | | |

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|---|---|
| 其他成果<br>(無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。) | 重要國際合作: 計畫主持人獲邀參加國際研討會擔任講員,促進國際交流<br>地點: 瓦倫西亞(Valencia) 9/29-10/1； 馬德里(Madrid) 10/2-10/7 |

| | 成果項目 | 量化 | 名稱或內容性質簡述 |
|---|---|---|---|
| 科教處計畫加填項目 | 測驗工具(含質性與量性) | 0 | |
| | 課程/模組 | 0 | |
| | 電腦及網路系統或工具 | 0 | |
| | 教材 | 0 | |
| | 舉辦之活動/競賽 | 0 | |
| | 研討會/工作坊 | 0 | |
| | 電子報、網站 | 0 | |
| | 計畫成果推廣之參與（閱聽）人數 | 0 | |

# 國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

■達成目標

□未達成目標（請說明，以 100 字為限）

□實驗失敗

□因故實驗中斷

□其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文：□已發表 □未發表之文稿 ■撰寫中 □無

專利：□已獲得 □申請中 ■無

技轉：□已技轉 □洽談中 ■無

其他：(以 100 字為限)

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）(以 500 字為限)

探討利用兔子的周邊神經及中樞神經損傷之動物模式，研究遠端乾針肌痛點刺激對於近端肌肉激痛典的終板雜訊電位的影響變化及可能路徑。透過本研究，將可以提供以電生理變化為主的資料，來瞭解遠端穴位針灸的可能療效探討。同時將實驗結果延伸到遠端針灸穴位的針灸治療對於近端肌肉止痛之病理生理機轉，對於傳統醫學與現代醫學的整合，更具有重要的指標意涵。