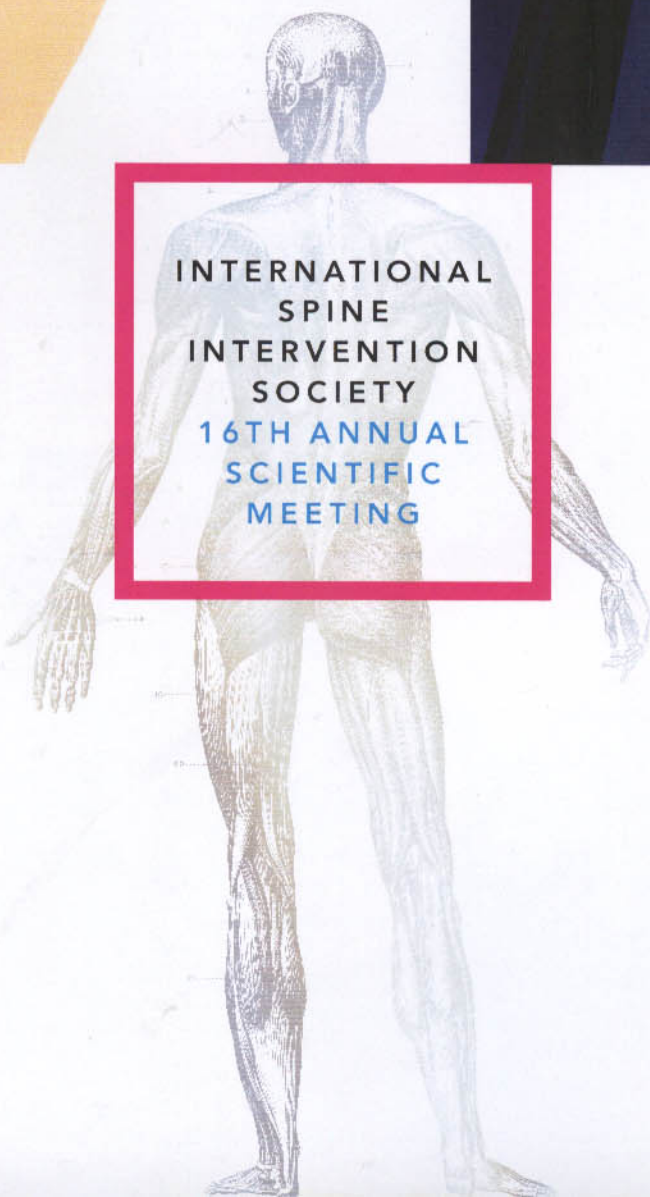


ANSWERS TO THE
OPPOSITION

JULY 23-26, 2008
LAS VEGAS, NEVADA

RIO ALL-SUITE
HOTEL & CASINO



INTERNATIONAL
SPINE
INTERVENTION
SOCIETY
16TH ANNUAL
SCIENTIFIC
MEETING



David Weber MD

Dr. David Weber is current medical director at Lake Cumberland Pain Center in Somerset, Kentucky. He has three office locations in Kentucky-Somerset, Bowling Green and Louisville. He is board certified by the American Board of Anesthesiology in both anesthesia and pain management. He has been an Assistant Clinical Professor of Anesthesiology at the University of Louisville.

He originally graduated from the University of Kentucky in 1981 with a degree in Civil Engineering. He returned to medical school in 1995 at University of Louisville. He completed a residency in anesthesia at the University of Louisville in June of 2005, serving as Chief Resident during his last year. He completed his pain fellowship at Massachusetts General Hospital in June 2006.

He resides in Louisville, Kentucky with his wife—Dr. Glenna Major, a child and adolescent psychiatrist, and his daughter Olivia.

Michael Whitworth MD

M L Whitworth is in private practice in Indiana performing advanced endoscopic disc and foraminal decompression procedures and annulus fibrosis modification procedures. He is active in physician education and pain research, and is a board member of ISIS.

Christopher Zarembinski MD

Christopher Zarembinski MD is an attending physician at the Pain Center at Cedars-Sinai Medical Center in Los Angeles. Specializing in anesthesiology, Dr. Zarembinski is board certified and holder of additional training certificates in pain management. He has practiced at Cedars-Sinai Medical Center for the past 17 years practicing exclusively in pain management, and is one of the original founders of the Pain Center. The Pain Center has become a model program for the hospital with respect to comprehensive management.

Dr. Zarembinski previously served as Assistant Clinical Professor of Anesthesiology at the University of California, Los Angeles (UCLA) Pain Management Center and at the University of Southern California (USC) Department of Anesthesiology. He was also a staff anesthesiology at the Huntington Memorial Hospital in Pasadena. Dr. Zarembinski received his medical degree from the University of Arizona School of Medicine. He completed his internship at St. Joseph's Hospital in Phoenix and his anesthesiology residency at Washington University in St. Louis. He also completed a fellowship in pain management at UCLA's Anesthesiology Department. Areas of interest include stem cell research as applied to spine and joint pain, telemedicine, and education.

Time / Place	Event	Speaker	
12:00 Brasilia 2, 6	LUNCH-Presentation: Spinal cord stimulation papers Sponsored by a grant from: Boston Scientific	Moderator: Harries Weber	Page 142
	TECHNOLOGY UPDATE	Moderator: Whitworth	
1:20	Lysis of Adhesions	Hammer	Page 144
1:40	Vertebroplasty	Whitworth	Page 156
2:00	Pulsed RF	Gorback	Page 160
2:20	Cryotherapy	Trescott	Page 161
2:35	Advanced Disc Therapies	Kapural	Page 162
2:50	Discussion		
3:00 Amazon A-F Exhibit Hall	Break in Exhibit Hall		
	RESEARCH	Moderator: Dreyfuss	
3:40	Transforaminal Etanercept Best Clinical Paper	Cohen	Page 170
3:47	Adult Stem Cell Best Basic Science Paper	Zarembinski	Page 172
3:54	Does Discography predict treatment response?	Cooper	Page 174
4:01	Infection present with modic changes	Aprill	Page 180
4:08	Biaculoplasty	Bogduk	Page 184
4:15	Medial Branch Blocks	Verrills	Page 186
4:22	Discussion		
	TECHNOLOGY UPDATE: An Engineering Update	Moderator: Baker	
5:30	Pulsed RF	Rittman	Page 178
5:45	Cooled RF	Harrison	Page 179
6:00	Spinal Cord Stimulation 1	Bradley	Page 182
6:15	Spinal Cord Stimulation 2	Cameron	N.S.
6:30	Spinal Cord Stimulation 3	Deyo	N.S.
6:45	Discussion		

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Saturday, July 26

Time / Place	Event	Speaker	
7:00 Amazon A-F Exhibit Hall	Continental Breakfast - Exhibit Hall		
7:55 Amazon GH	Announcements – General Session		
	RESEARCH	Moderator: Dreyfuss	
8:00	Spineology	Depalma	Page 195
8:07	Contrast Flow	Furman	Page 197
8:14	Hylan	Depalma	Page 199
8:21	Pain Vertebral Fracture	Bogduk	Page 201
8:28	Peripheral Stimulation	Verrills	Page 203
8:49	Functional Restoration	Bogduk	Page 205
8:42	Ganglion Block	Zarembinski	Page 207
8:49	Sacral Lateral Branch Blocks	Dreyfuss	Page 209
9:00	Discussion		

Injectable Adult Stem Cells as a Novel Therapeutic Platform for Anterior and Posterior Spinal Fusion

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Introduction

Spinal fusion has become a popular surgical technique used to provide segmental fixation of the spine. We have previously shown that stem cell-based therapy using safe, non-virally genetically engineered adult stem cells (ASCs), that express bone morphogenetic protein (BMP) genes, could induce bone formation *in vivo*. Therefore, we hypothesized that primary adult stem cells, nucleofected with human BMP-6 gene, directly injected into the intervertebral disc (IVD) or its vicinity could induce posterior or anterior spinal fusion.

Methods

Porcine ASCs were isolated from freshly harvested adipose tissue. Overexpression of hBMP-6 was achieved using nucleofection, an electroporation-based technique (Fig. 1). Engineered ASCs were labelled with luciferase or GFP marker genes prior to injection. 24 hours post nucleofection the cells were injected into the caudal intervertebral disc of immunodeficient rats or into the lumbar paraspinal muscle of immunodeficient mice. Spinal fusion was monitored using real time, non-invasive micro-CT, *in vivo*. Cell survival was monitored on tissue level using a non-invasive, quantitative, bioluminescence imaging system (Fig. 2A), and on cellular level using a novel *in vivo* fibered confocal microscope (Fig. 2B).