

CURRICULUM VITAE

David L. Brumfield

EDUCATION

November, 1978: B.S. Biomedical Engineering, Louisiana Tech University,
Ruston, LA
Curriculum Emphasis: Mechanical Engineering

HONORS

Cum Laude Graduate
Tau Beta Pi—Engineering Honor Fraternity
Alpha Epsilon Delta—Premedical Honor Society
Medtronic Technical Contributor of the Year Award – 1999; Team award 2000, 2001, 2002
Bakken Society – Medtronic’s highest technical honor – 2004
Louisiana Tech University Biomedical Engineering Distinguished Alumnus of the Year - 2007

EMPLOYMENT

May 2014-present Consultant, Product Development –
Orthopaedics, Extremities, & Spine

Apr 2010–Apr 2014 Senior Vice President – Research and Development
Custom Spine, Inc.
Parsippany, NJ

Jan 2006–Feb 2010 Vice President – Research & Development
Smith & Nephew, Inc. Trauma Division
Memphis, TN

March 2005-Dec 2005 Vice President-Strategic Development
Medtronic Spine and Biologics

July 1999-March 2005 Vice President-Product Development
Medtronic Spine and Biologics
Memphis, TN

August 1991-July 1999 Group Director-Product Development
Sofamor Danek Group

February 1991-August 1991 Director-Product Development
Sofamor Danek Medical, Inc.
Memphis, TN

April 1988-February 1991	Director of Engineering-Orthopaedic Trauma Smith & Nephew Richards Medical, Inc.
June 1986-April 1988	Engineering Manager-Orthopaedic Trauma Smith & Nephew Richards Medical, Inc.
July 1982-June 1986	Senior Product Engineer Smith & Nephew Richards Medical, Inc.
May 1979-June 1982	Product Development Engineer Smith & Nephew Richards Medical, Inc. Memphis, TN
January 1979-April 1979	Construction Engineer H. B. Zachry Co. Lone Star, TX

U.S. PATENTS (not including foreign equivalents)

1. U.S. Patent #4,554,915 Bone Fixation Frame, November 26, 1985
2. U.S. Patent #4,827,917 Femoral Fracture Device, May 9, 1989
3. U.S. Patent #5,032,125 Intramedullary Hip Screw, July 16, 1991
4. U.S. Patent #5,062,844 Method and Apparatus for the Fixation of Bone fractures, Limb Lengthening and the Correction of Deformities, November 5, 1991
5. U.S. Patent #5,129,899 Bone Fixation Apparatus, July 14, 1992
6. U.S. Patent #5,167,663 Femoral Fracture Device, December 1, 1992
7. U.S. Patent #5,312,406 Method of Treating an Intertrochanteric Fracture, May 17, 1994
8. U.S. Patent #5,209,751 Spinal Fixation System, May 11, 1993
9. U.S. Patent #5,352,231 Nut Starter Wrench for Orthopaedic Fixation System, October 4, 1994
10. U.S. Patent #5,396,880 Endoscope for Direct Visualization of the Spine and Epidural Space, March 14, 1995
11. U.S. Patent #5,527,314 Spinal Fixation System, June 18, 1996
12. U.S. Patent #5,534,002 Spinal Fixation System, July 9, 1996
13. U.S. Patent #5,562,662 Spinal Fixation System and Method, October 8, 1996
14. U.S. Patent #5,562,666 Method for Treating Intertrochanteric Fractures Utilizing a Femoral Fracture Device, October 8, 1996

15. U.S. Patent #5,609,592 Spinal Fixation System, March 11, 1997
16. U.S. Patent #5,810,878 Rod Introducer Forceps, September 22, 1998
17. U.S. Patent #5,910,141 Rod Introduction Apparatus, June 8, 1999
18. U.S. Patent#5,947,966 Device for Linking Adjacent Rods in Spinal Instrumentation, September 7, 1999
19. U.S. Patent #6,036,692 Rod Introducer Forceps, March 14, 2000
20. U.S. Patent#6,113,600 Device for Linking Adjacent Rods in Spinal Instrumentation, September 5, 2000
21. U.S. Patent#6,136,003 Device for Linking Adjacent Rods in Spinal Instrumentation, October 24, 2000
22. U.S. Patent#6,146,386 Cable Operated Bone Anchor Compressor, November 14, 2000
23. U.S. Patent#6,176,861 Modular Spinal System, January 23, 2001
24. U.S. Patent#6,235,028 Surgical Guide Rod, May 22, 2001
25. U.S. Patent#6,248,107 B1 System for Reducing the Displacement of a Vertebra, June 19, 2001
26. U.S. Patent#6,280,442 B1 Multi-Axial Bone Screw Assembly, August 28, 2001
27. U.S. Patent#6,379,357 B1 Modular Spinal System, April 30, 2002
28. U.S. Patent#6,402,751 B1 Device for Linking Adjacent Rods in Spinal Instrumentation, June 11, 2002
29. U.S. Patent#6,436,099 B1 Adjustable Spinal Tether, August 20, 2002
30. U.S. Patent#6,660,004 B2 Multi-axial Bone Screw Assembly, December 9, 2003
31. U.S. Patent#7,367,978 B2 Adjustable Spinal Tether, May 6, 2008
32. U.S. Patent#7,575,587 B2 Top-tightening Side-locking Spinal Connector Assembly, August 18, 2009
33. U.S. Patent#7,625,376 B2 Reducing Instrument for Spinal Surgery, December 1, 2009
34. U.S. Patent#7,727,261 B2 Multi-axial Bone Screw Assembly, June 1, 2010

35. U.S. Patent#7,744,598 B2 Reducing Instrument for Spinal Surgery, June 29, 2010
36. U.S. Patent#8,105,329 B2 Reducing Instrument for Spinal Surgery, January 31, 2012
37. U.S. Patent#8,298,274 B2 Multi-axial Bone Screw Assembly, October 30, 2012
38. U.S. Patent#8,529,604 B2 Multi-axial Bone Screw Assembly, September 10, 2013
39. U.S. Patent#8,617,216 B2 Fully-Adjustable Bone Fixation Device, December 31, 2013
40. U.S. Patent#8,715,283 B2 Fracture Fixation Device, May 6, 2014
41. U.S. Patent #9,232,955 B2 Methods and Devices for Installing Standard and Reverse Shoulder Implants, January 12, 2016
42. U.S. Patent #9,668,784 B2 Facet Screw System and Method, Jun 6, 2017
43. U.S. Patent #9,770,534 B2 Graft Fixation, September 26, 2017
44. U.S. Patent #9,925,068 B2 Bone Harvester and Bone Marrow Removal System and Method, March 27, 2018
45. U.S. Patent #10,245,088 B2 Bone Plating System and Method, April 2, 2019
46. U.S. Patent #10,314,622 B2 Facet Screw System and Method, June 11, 2019
47. U.S. Patent #10,426,495 B2 Methods and Devices for Installing Standard and Reverse Shoulder Implants, October 1, 2019
48. U.S. Patent #10,653,467 B2 Intra-osseous Plate System and Method, May 19, 2020
49. U.S. Patent #10,842,512 B2 Methods and devices for Installing Standard and Reverse Shoulder Implants, November 24, 2020
50. U.S. Patent # 11,020,244 B2 Bone Harvester and Bone Marrow Removal System and Method, June 1, 2021
51. U.S. Patent # 11,154,340 B2 Bone Plating System and Method, October 26, 2021
52. U.S. Patent # 11,426,219 B2 Intra-Osseous Plate System and Method, August 30, 2022
53. U.S. Patent # 11,883,040 B2 Methods and devices for Installing Standard and Reverse Shoulder Implants, January 30, 2024
54. U.S. Patent # 11,925,491 B2 Sterile Surgical Implant Holder, March 12, 2024

55. U.S. Patent # 11,969,193 B2 Intra-osseous Plate System and Method, April 30, 2024

PUBLICATIONS AND PRESENTATIONS (asterisk indicates presentation made by D.L. Brumfield)

1. E. C. Hills, R. A. Calandruccio, M.D., D. L. Brumfield, T. W. Sander: "An In Vitro Mechanical Evaluation of the Rigidity of Two External Fixation Clamps for Ankle Fusion". Southern Biomechanical Engineering Conference, San Antonio, TX, September 1983.
- 2.* E. C. Hills, R. A. Calandruccio, M.D., D.L. Brumfield, T. W. Sander: "An In Vitro Mechanical Evaluation of the Rigidity of Two External Fixation Clamps for Ankle Fusion". Orthopaedic Trauma Hospital Association Meeting, Houston, TX, October 1983.
- 3.* M. H. Pope, Ph.D., T. Kristiansen, M.D., B. C. Fleming, D. L. Brumfield: "A Biomechanical analysis of Various Half Pin Fixators", Orthopaedic Trauma Hospital Association Meeting, Baltimore, MD, October 1984.
- 4.* D. L. Brumfield: "Biomechanics of Intramedullary Nail Fixation". Symposium: Current Concepts in Locked Intramedullary Nailing, Memphis, TN, August 1987.
- 5.* D. L. Brumfield: "Biomechanics of Intramedullary Nail Fixation". Symposium: Current Concepts in Locked Intramedullary Nailing, Los Angeles, CA, September 1987.
- 6.* D. L. Brumfield: "Biomechanics of Intramedullary Nail Fixation". Symposium: Current Concepts in Locked Intramedullary Nailing, Norfolk, VA, October 1987.
- 7.* D. L. Brumfield: "Biomechanics of Intramedullary Nail Fixation". Symposium: Current Concepts in Locked Intramedullary Nailing, Biloxi, MS, November 1987.
8. John M. Cuckler, M.D., Indong Oh, M.D., D. L. Brumfield, R. Georgette, K. P. Spindler, M.D.: "Ti-6Al-4V Cable: A New Orthopaedic Device for Internal Fixation", Poster Exhibit-55th Annual Meeting of the American Academy of Orthopaedic Surgeons, Atlanta, GA, February 1988.
- 9.* D. L. Brumfield, M. H. Pope, Ph.D., D. Paley, M.D., B. Fleming: "Biomechanics of the Ilizarov System". Memphis in May Orthopaedic Trauma Symposium, Memphis, TN, May 1988.
- 10.* D. L. Brumfield: "Design and Manufacturing Considerations of Intramedullary Nails". Memphis in May Orthopaedic Trauma Symposium, Memphis, TN, May 1988.
11. Thomas A. Russell, M.D., J. Charles Taylor, M.D., David G. Lavelle, M.D., Neil B. Beals, David L. Brumfield, and A. Glenn Durham: "Mechanical Characterization of Femoral Interlocking Intramedullary Nailing Systems", Journal of Orthopaedic Trauma, Vol. 5, No. 3, pp. 332-340, 1991 Raven Press, Ltd., New York.
- 12.* D. L. Brumfield: "The Biomechanics of Spinal Implants", Curso de Cirugia de Columna Vertebral, Mexico City, Mexico, January 1993.

- 13.* D. L. Brumfield: "The Biomechanics of Spinal Implant Systems", Actualizacion en Cirugia de Columna Vertebral, Mexico City, Mexico, July 1993.
- 14.* D. L. Brumfield: "Engineering/Materials Science-Technical Considerations for Spinal Implants". Second International Meeting on Advanced Spine Techniques, Curacao, Netherlands Antilles, April 1995.
15. Eduardo R. Luque, M.D., David L. Brumfield, and Marvin N. Anderson: "The GDLH Posterior Spinal System". Lumbosacral and Spinopelvic Fixation, pp. 309-321, 1996 Lippincott-Raven.
- 16.* D. L. Brumfield: "Biomechanics of Intrasacral Fixation and the LIBERTY Spinal System". Total Spine: Advanced Concepts and Constructs, Cancun, Mexico, January 1997.
- 17.* D. L. Brumfield: "Design Rationale and Biomechanics of the CD HORIZON Spinal System". Total Spine: Advanced Concepts and Constructs, Cancun, Mexico, January 1997.
- 18.* D. L. Brumfield: "A Biomechanical Analysis of Posterior Spinal Instrumentation Constructs". Fourth International Meeting on Advanced Spine Techniques, Bermuda, July 1997.
- 19.* D. L. Brumfield: "Results of Biomechanical Testing of Spinal Implant Systems". Total Spine: Advanced Concepts and Constructs, Cancun, Mexico, February 1998.
- 20.* D. L. Brumfield, Dennis J. Buchanan, David W. Polly, M.D., William R. Klemme, M.D., "A Biomechanical Analysis of Posterior Thoracic Spinal Instrumentation Constructs Using a Sagittally Contoured Model"-Fifth International Meeting on Advanced Spine Techniques, Sorrento, Italy, May 1998.
21. David W. Polly, Theodore J. Choma, David L. Brumfield: "Increased Rod Diameter or Number of Hooks: Which is Stiffer?"- Thirty-third Annual Meeting of the Scoliosis Research Society, New York, NY, September 1998.
22. David W. Polly, M.D., William R. Klemme, M.D., David L. Brumfield, Dennis J. Buchanan: "A Biomechanical Analysis of Posterior Thoracic Spinal Instrumentation Constructs Using a Sagittally Contoured Model". Poster Exhibit – Thirty-third Annual Meeting of the Scoliosis Research Society, New York, NY, September 1998.
23. Lawrence G. Lenke, M.D., Stewart Young, Chris Johnson, David L. Brumfield: "A Biomechanical Comparison of a Single vs. Dual Rod Anterior Long Segment Constructs". Poster Exhibit- Eighth International Meeting on Advanced Spine Techniques, Paradise Island, Bahamas, July 2001.
24. James L. Chappuis, M.D., Terry J. Orme, Ph.D., David L. Brumfield, David Smith, Matt Morrison, Michael Veldman, Rick A. Chappuis: "Fixation Strength Studies With Fenestrated Cemented Pedicle Screw in Human Cadaver"-Poster Exhibit - Sixteenth Annual Meeting North American Spine Society, Seattle, Washington, October 2001.
25. James L. Chappuis, M.D., Terry J. Orme, Ph.D., Rick A. Chappuis, David L. Brumfield, Matt Morrison, Michael Veldman, Brianne Landmann, Lucas Wison, David Smith: "Anterior Plowing

Resistance Studies with Fenestrated Cemented Pedicle Screws in Human Cadaver”- Ninth International Meeting on Advanced Spine Techniques, Montreux, Switzerland, May 2002.

26. Phillippe Maxy, David W. Polly, M.D., Michael F. O’Brien, M.D., Timothy R. Kuklo, M.D., Lawrence G. Lenke, M.D., David L. Brumfield. “Finite Element Modeling of Thoracic Pedicle Screw Constructs” E-Poster Exhibit-Tenth International Meeting on Advanced Spine Techniques, July 2003, Rome, Italy.
27. David W. Polly, M.D., Philippe Maxy, Michael F. O’Brien, M.D., Timothy R. Kuklo, M.D. Jack Engsborg, Ph.D., David Brumfield: “Finite Element Modeling of Thoracic Pedicle Screw Constructs”. Poster Exhibit-Thirty Eighth Annual Meeting Scoliosis Research Society September 2003, Quebec, Canada.
28. Emre R. Acaroglu, M.D., Vedat Deviren, M.D., Joe Lee, BS, Michael F. O’Brien, M.D., Timothy R. Kuklo, M.D., David Brumfield, BS, Lawrence G. Lenke, M.D., David W. Polly, M.D., Christian Puttlitz, Ph.D.: “Thoracic Spine Construct Stability Is Dependent Upon the Number and Configuration of Pedicle Screws”. Poster Exhibit-Thirty Ninth Annual Meeting Scoliosis Research Society, September 2004, Buenos Aires, Argentina.
29. Vedat Deviren, MD, Emre Acaroglu, MD, Joe Lee, BS, Masaru Fujita, MD, Serena Hu, MD, Lawrence G. Lenke, MD, David Polly, Jr., MD, Timothy R. Kuklo, MD, Michael O’Brien, MD, David Brumfield, MS, and Christian M. Puttlitz, PhD. “Pedicle Screw Fixation of the Thoracic Spine: An *In Vitro* Biomechanical Study on Different Configurations”, SPINE, Vol. 30, Number 22, pp 2530-2537, 2005 Lippincott Williams & Wilkins, Inc.

PROFESSIONAL AFFILIATIONS

Member, American Society for Testing and Materials-Committee F-4, 1986 - 1992

Chairman, Louisiana Tech University Department of Biomedical Engineering Advisory Board, June, 1992-June, 1993

Member, Louisiana Tech University Department of Biomedical Engineering Advisory Board, April, 1989-June, 1993

Board of Directors, Southeast BIO (regional nonprofit organization that fosters the growth of the life sciences industry in the Southeastern United States), 2007- 2010

Science Advisory Board, Juvent Regenerative Technologies Corporation, 2016-present

PERSONAL

Citizenship: USA

Other: President - Porsche Club of America, Mid-South Region, 2006
Vice President - Porsche Club of America, Mid-South Region, 2005
Auto Racer, Porsche Club of America, National Points Championship
2nd Place 2014, 2018
High-Performance Driving Instructor, Porsche Club of America
Other Hobbies: Scuba Diving, Woodworking, Flyfishing, Guitar, RV
camping, Hiking, Watersports