L. RUSSELL ALBERTS

President, Alberts BIOMECHANICS LLC
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AREAS OF RESEARCH SPECIALIZATION

Viscoelastic Properties of Cartilage
Tribology of Total Joint Arthroplasty
Orthopedic Biomechanics
Orthopedic Biomedical Materials

EDUCATION

Ph.D. 1982 Iowa State University, Ames, IA Biomedical Engineering/Engineering Mechanics
M.S. 1978 Iowa State University, Ames, IA Biomedical Engineering/Engineering Mechanics
B.S. 1975 Columbia University, New York, NY Bioengineering/Chemical Engineering
B.S. !974 Nebraska Wesleyan University, Lincoln, NE Physics

PROFESSIONAL EMPLOYMENT

7/1/2001 to present	President, Alberts Biomechanics Omaha, NE 68135
9/1/95 to 6/30/2001	Director, Orthopaedic Biomechanics Laboratory, Department of Orthopaedic Surgery and Rehabilitation, University of Nebraska Medical Center, Omaha, NE
7/1994 to 8/31/95	Full time consultant to manage and setup biomechanics laboratory, Department of Orthopaedic Surgery and Rehabilitation, University of Nebraska Medical Center, Omaha, NE
2/1993 to 5/1994	Visiting Assistant Professor, Department of Orthopaedic Surgery and Rehabilitation, University of Nebraska Medical Center, Omaha, NE
8/1987 to 5/1994	Assistant Professor, Department of Engineering Mechanics, University of Nebraska-Lincoln, Lincoln, NE
9/1986 to 5/1987	Visiting Assistant Professor, Department of Engineering Mechanics, University of Nebraska-Lincoln, Lincoln, NE
7/1986 to 8/1989	Visiting Assistant Professor, Department of Orthopaedic Surgery and Rehabilitation, University of Nebraska Medical Center, Omaha, NE
8/1982 to 3/1986	NIDR Postdoctoral Trainee in Biomaterials at Rensselaer Polytechnic Institute (after 8/1985 Research Associate), Troy, NY

PROFESSIONAL AND HONORARY SOCIETIES

American Society of Biomechanics, Member

American Society of Mechanical Engineers, Member

American Society for Testing of Materials, Member

Biomedical Engineering Society, Member

Orthopedic Research Society, Member

Society for Biomaterials, Member

PROFESSIONAL ACTIVITIES and SERVICE

American Society for Testing Materials
Task force Chair, F04.15.10, Acrylic Bone Cement Test Methods

National Center for Supercomputing Application
Ad hoc reviewer for proposals.

American Society of Mechanical Engineers
Reviewer for *Innovative Approaches for Teaching Descriptive Geometry with CADD* by John G. Ghering

GRANTS and CONTRACTS

External Funding

Encore Orthopaedics, $29,100
Wear Simulation Tests of a Mobile Bearing Knee, 2000-2001
Investigators: L. Russell Alberts, James R. Neff and Hani Haider

Encore Orthopaedics, $5,124
Knee Stability Test II, 2000
Investigators: L. Russell Alberts, James R. Neff and Hani Haider

Encore Orthopaedics, $6,588
Knee Stability Test, 2000
Investigators: L. Russell Alberts and James R. Neff

Zimmer, Inc., $51,400
Wear Simulation Comparison between AMTI and Stanmore Simulators, 1999-2000
Investigators: L. Russell Alberts and James R. Neff

Smith & Nephew, Inc. $4,370
Kinematics of Knee Implants, 1999
Investigators: L. Russell Alberts and James R. Neff

Advance Biosurfaces, Inc., $35,000
Wear Simulation Tests of *In-Vitro* Polymerized Knee Implant Surfaces, 1999-2000
Investigators: L. Russell Alberts and James R. Neff

Weibe Foundation, $73,750
Stair-step Platform and Force Plates for Gait Analysis, 1999
Investigators: L. Russell Alberts and Glen Ginsburg

Encore Orthopaedics, $35,750

Wear Simulation Tests of Ceramic on UHMWPE Knee Implants, 1999
Investigators: L. Russell Alberts and James R. Neff

Wright Medical, Inc. $160,00
Studies to Improve Polymethylmethacrylate Bone Cement. May 1996 to May 1998
Investigators: L. Russell Alberts and James R. Neff

Howmedica, Inc. $29,267
Study of a Hinged Knee Design, Jan. 1996 to Dec. 1996
Investigators: L. Russell Alberts and James R. Neff

University of Nebraska Medical Center, 25% FTE, December 1993 to May 1994, $8,447
Was funded by the Department of Orthopedic Surgery at UNMC to set up an orthopedic biomechanics laboratory.

Biomet, Inc., equipment grant $15,000
"*In vitro* strains in the intact human maxillary"
Principal Investigator: L. Russell Alberts
Co-Investigator: Harold Tu.

National Center for Supercomputing Applications, 13 Service Units (about $13,000)
"A Finite Element Analysis of Retained and Removed Orthopedic Screws" and "Finite Element Analysis of the Growth Plate in Bone" December 1, 1992 to November 31, 1993
Principal Investigator: L. Russell Alberts

National Center for Supercomputing Applications (NCSA), 4.0 Service Units (value about $4,000) Dec. 1991 to Dec. 1992.
"Finite element studies of the growth plate in bones and finite element study of removed and retained orthopedic screws."
Principal Investigator: L. R. Alberts

National Science Foundation, $130,649 ($87,649 NSF, $43,000 UNL matching)
"Engineering Research Equipment Grant: Workstation Laboratory"

September 1, 1991 to February 28, 1993
Principal Investigator: Mehrdad Negahban
Co-investigators: L. R. Alberts, M. S. Wu, C. W. Martin

National Center for Supercomputing Applications (NCSA), 5.0 Service Units (value about $5,000) Sept. 1990 to Sept. 1991.
"Finite element studies of the growth plate in bones"
Principal Investigator: L. R. Alberts

National Science Foundation, $34,180 Equipment Grant, July 1, 1989 to Dec. 31, 1990
Awarded an equipment grant as Principal Investigator (with Y. C. Pao as co-Investigator) on July 1, 1989 from the National Science Foundation entitled "Equipment for

Mechanical Analysis of Growth Plate Cartilage.
Principal investigator: L. R. Alberts

University of Nebraska Medical Center, 10% FTE, April 1988 to August 1989, $5,307
Funded as a Visiting Assistant Professor in Biomechanics for the Department of Orthopedic Surgery, University of Nebraska Medical Center.
Principal investigator: John Connolly

University of Nebraska Medical Center, 20% FTE, June 1987 to March 1988, $7,333
Was funded by the Department of Orthopedic Surgery at UNMC from an NIH grant entitled "Biophysical Effects of Epiphyseal Traction"
Principal investigator: John Connolly.

FULL LENGTH PUBLICATIONS AND ABSTRACTS IN REFEREED JOURNALS

1987: 1) L. R. Alberts: Effects of periosteal activation on bone repair and ingrowth. *Journal of Biomedical Materials Research, Vol. 21,* 429-442.

1989: 1) R. Guse, J. Connolly, R. Alberts, and L. Lippiello: Use of chondrodiatasis to prevent post-traumatic growth deformity: Definition of chondrostatic tension in an animal model. *Journal of Orthopedic Research, Vol. 7*, 667-673.

1992: 1) L. R. Alberts and W. A. Abdul-shafi: Biphasic creep indentation studies of bovine growth plate cartilage. *Journal of Biomechanics, Vol. 25*, 660. (Abstract)

2) L. R. Alberts and W. A. Abdul-shafi: Biphasic creep indentation studies of bovine growth plate cartilage from animals near skeletal maturity. *Journal of Biomechanics Vol. 25*, 799. (Abstract)

3) L. R. Alberts: Use of instructional CAD software in a freshman class on computer-aided graphics. *Computers in Education (COED), Vol. 11(2),* 26-32.

1993: 1) L. R. Alberts, Y. C. Pao, and L. Lippiello: A large-deformation finite-element study of the canine distal femoral epiphyseal plate. *Journal of Biomechanics Vol. 26,* 1291-1305.

1994: 1) L. Lippiello, A. Idouraine and R. Alberts Stress resistance engineering in cellular trauma: Application to articular cartilage. *Annals of Biomedical Engineering 22 (Supplement 1):* 37, 1994. (Abstract)

1998: 1) L. R. Alberts, C. Mahoney and J. R. Neff Comparison of the Nebraska Collar, a New Prototype Immobilization Collar, with Three Standard Models. *J.*

Orthopaedic Trauma 12(6):425-430.

2001: 1) M. W. Beatty, A. K. Ojha, J. L. Cook, L. R. Alberts, G. K. Mahanna, L. R. Iwasaki, J. C. Nickel Small intestinal submucosak versus salt-extracted PGA-PLLA: A comparison of neo-cartilage derived from two scaffold materials. *Tissue Engineering* in press

2002: 1) S. D. Scholten, N. Sterrgiou, C. Blenke, L. R. Alberts A dynamical systems examination of intralimb coordination during running over obstacles of differrent heights. *Medicine and Science in Sports Exercise* in press, expected publication date Jan., 2002

Manuscripts in Progress

1) L. R. Alberts, K. O. Phillips, H. K. Tu, W. Stinson, A. Friedman A standard biologic model for assessment of osseous strain patterns and plating systems in the human maxilla. Submitted to *Journal of Oral and Maxillofacial Surgery*.

2) D. Tomes, L. C. Helllbusch, L. R. Alberts Stretching and breaking characteristics of cerebrospinal fluid shunt tubine. To be submitted to *Journal of Neurosurgery* or *Journal of Pediatric Neurobiology,Nneurology and Neurosurgery.*

3) W. A. Abdulshafi, Y. C. Pao, L. R. Alberts and G. Ledder: Analytical Solution to the Biphasic Creep-Indentation Problem Adapted to Growth Plate Cartilage.

4) R. Alberts, L. Lippiello, and A. Idouraine Chondroprotective effect of essential fatty acids in a rabbit model. .

PUBLICATIONS IN CONFERENCE PROCEEDINGS AND PRESENTATIONS

1984: 1) L. R. Alberts: Effects of periosteal activation on bone repair and bone growth into porous implants. *Transactions of the Second World Congress on Biomaterials and 10th Annual Meeting Society of Biomaterials, Vol. 7*, 246.

1988: 1) R. Guse, R. Alberts, J. Connolly and L. Lippiello: Definition of chondrostatic tension in an animal model. *Transactions of the 34th Annual Meeting Orthopaedic Research Society, Vol. 13*, 292.

2) L. R. Alberts and Y. C. Pao: Microcomputer applications of AUTOLISP and COMMON LISP. *ASME Computers in Engineering 2:*447-453.

1990: 1) L. R. Alberts: Plane-strain finite element study on the developing canine distal femoral growth plate. *Proceedings of the First World Congress of Biomechanics, Vol. 2*, 81. August 30 - September 4, 1990.

2) L. R. Alberts: Use of Instructional CAD software in a freshman class on computer-aided graphics. Part 2: Codes for Student Use. *Proceedings of the American Association of Engineering Education Annual Conference. Vol. 2*:1376-1379. June 26, 1990.

3) L. R. Alberts: Use of Instructional CAD software in a freshman class on computer-aided graphics. *Proceedings of the American Association of Engineering Education Annual Conference. Vol. 2:*1507-1510. June 26, 1990.

1991: 1) L. R. Alberts and W. A. Abdul-shafi: Biphasic Creep Indentation Studies of Bovine Growth Plate Cartilage. *Proceedings of the 15th Annual Meeting of the American Society of Biomechanics.* pp. 72-74. October 16-18, 1991.

2) L. R. Alberts and W. A. Abdul-shafi: Biphasic Creep Indentation Studies of Bovine Growth Plate Cartilage. *13th Annual Meeting of the International Society of Biomechanics: Book of Abstracts.* pp. 491-492. December 9-13, 1991.

1992: 1) Y. C. Pao, Xing Gu, Qi-Sun Yuan, and L. R. Alberts: Bicubic-spline Parametric Representation of the 3-D Surface of a Growth Plate. *ASME, 1992 Winter Annual Meeting*, Anaheim, CA, Nov. 8-13, 1992.

1994. 1) L. Lippiello, A. Idouraine and R. Alberts Stress resistance engineering in cellular trauma: Application to articular cartilage. Podium presentation at the meeting of the Biomedical Engineering Society in Phoenix, October 1994.

1995 1) L. R. Alberts, H. K. Tu., K. O. Phillips, W. W. Stinson and A. Friedman A standardized biological model to assess the response of maxillofacial plating systems due to static loads. Bioengineering conference of the American Society of Mechanical Engineers, June 30, 1995.

1996 1) James R. Neff and L. R. Alberts Stiffness of VSP Plates and ISOLA Rod Systems Roy Jacobs Lecture, Kansas City

1997 1) L. R. Alberts, Craig Mahoney, James R. Neff and Hassan Sirhan Stiffness of VSP Plates and ISOLA Rod Systems Nebraska Academy of Sciences, Lincoln, Nebraska

1998 1) L. R. Alberts Poisson s Ratio of Vacuum Mixed CMW-1 and CMW-3 Polymethylmethacrylate Bone Cement. Orthopaedic Research Society, New Orleans, March 16-19, 1998

1999: 1) L. R. Alberts, Kenneth E. Barnes and James R. Neff Molded Waisted Cylinders for Fatigue Tests of Vacuum-Mixed PMMA Bone Cement. Orthopaedic Research Society, Anaheim, February 1-4, 1999.

2) L. R. Alberts, Kenneth E. Barnes and James R. Neff Mechanical and Strength Properties of a Low and High Viscosity PMMA Cement, Vacuum Mixed, Room Temperature and Pre-Chilled Components. Society for Biomaterials, Providence, April 28-May 2, 1999

3) L. R. Alberts, C. R. Mahoney, J. R. Neff and H. Serrhan Fatigue Failure of Posterior Spinal Implants under Torsion and Compressive Loads. Society for Biomaterials, Providence, April 28-May 2, 1999.

2000: 1) J. M. Mahalek, L. R. Alberts, W. Ante, J. R. Neff, W. W. Stinson Biomechanical stability testing of posterior spinal instrumentation in human cadaveric spines. Sixth World Biomaterials Congress, Kamuela, HI, May 15-20, 2000

2) N. B. Bruggeman, L. R. Alberts, R. C. Ramaekers, J. R. Neff Viscoelastic properties of human articular cartilage. Sixth World Biomaterials Congress, Kamuela, HI, May 15-20, 2000

3) M. W. Beatty, A. K. Ojha, J. L. Cook, L. R. Alberts, G. K. Mahanna, L. R. Iwasaki, J. C. Nickel Small intestinal submucosa versus salt-extracted PGA-PLLA: A comparison of neo-cartilage derived from two scaffold materials. Third SIS Symposium, Orlando, FL, November 29-30, 2000

4) G. M. Ginsburg, C. Trease, L. R. Alberts Slip-out behavior of traditional pedicle hooks vs. A new serrated hook design. Scoleosis Research Society, Sydney, Australia

2001: 1) L. R. Alberts, J. R. Neff, N. B. Bruggeman, S. M. Keenan Effect of preservation technique on the viscoelastic properties of cartilage. Orthopaedic Research Society, San Francisco, CA, Feb. 25-28, 2001. (Poster)

2) L. R. Alberts, J. R. Neff, J. D. Webb Wear simulation comparison of a zirconia and cobalt chrome femoral knee implant. Orthopaedic Research Society, San Francisco, CA, Feb. 25-28, 2001. (Poster)

3) L. R. Alberts, J. R. Neff, N. B. Bruggeman, S. M. Keenan Effect of preservation technique on the viscoelastic properties of cartilage. Society for Biomaterials, St. Paul, MN, April 24-29, 2001. (Podium presentation)

4) L. R. Alberts, J. R. Neff, J. D. Webb Wear simulation comparison of a zirconia and cobalt chrome femoral knee implant. Society for Biomaterials, St. Paul, MN, April 24-29, 2001. (Podium presentation)

5) A. K. Ojha, L. R. Alberts, M. W. Beatty, J. L. Cook, G. K. Mahanna, L.

R. Iwasaki, J. C. Nicke. Differences in neo-cartilage derived from two scaffold materials. Society for Biomaterials, St. Paul, MN, April 24-29, 2001.

2002: 1) H. Haider, L R Alberts, M. P Laurent, T. S. Johnson, Jian Yao, L. N. Gilbertson, P. S. Walker, J. R. Neff, K. L Garvin, Comparison between force-controlled and displacement-controlled in-vitro wear testing on a widely used TKR implant. Orthopaedic Research Society, Dallas, TX Feb. 10-13, 2002