

MINUTES OF THE HOUSE HEALTH AND HUMAN SERVICES COMMITTEE

The meeting was called to order by Chairperson Brenda Landwehr at 1:30 P.M. on February 5, 2008 in Room 526-S of the Capitol.

All members were present except:  
Representative Patton

Committee staff present:  
Dianne Rosell, Revisor of Statutes Office  
Melissa Calderwood, Kansas Legislative Research Department  
Cindy Lash, Kansas Legislative Research Department  
Chris Haug, Committee Assistant

Conferees appearing before the committee:  
Dr. Paul Wooley, PhD, Via Christi Research Institute

Others Attending:  
See Attached List

The minutes of the February 4th meeting were e-mailed for review prior to the meeting. Vice Chairperson Mast made the motion to approve the minutes, Representative Neighbor seconded the motion. The motion carried.

Bill Introduction -  
Representative Quigley introduced a bill that will not allow a pharmacist to substitute a generic pill for epilepsy. Representative Neighbor seconded the motion and the motion carried.

Dr. Paul Wooley, PhD Director of Research with Via Christi Research Institute gave a presentation on Aerospace meets Medicine. The presentation is attached. (Attachment 1)

Representative Crum wondered if this had any application for artificial limbs. Dr. Wooley stated, yes absolutely. We can expand out to the joint all the way to the pariparel limb. An interesting situation has evolved in the Olympics where individuals who have these blades that allow them to run have been banned from competing because they are faster with the blades. The blade type limbs are made from composite materials.

Chairperson Landwehr asked Dr. Wooley to elaborate on the tier 1 and tier 2 suppliers that exist among the aircraft suppliers and who they were. Dr. Wooley stated he was too new to say, so Dave McDonald, Associate Provost of Research at Wichita State University answered the question. Tier 1 and Tier 2 folks are the composite manufacturers mentioned in the presentation. Right now they are making specific parts solely for the aircraft industry. We are hoping to inject into their product flow some of these medical devices. Tier 2 manufacturers make the individual pieces and these are supplied to the Tier 1 manufacturers, which do a little more assembly and they supply to the OEM's, the Original Equipment Manufacturers. These are the Boeing's and Beachcrafts and they do the major assembly at their plants. Dr. Wooley made one further comment on these smaller companies. He said, "Of course the Boeing's of the world are too large to apply for small business grants, particularly from NIH where I believe some of the smaller companies, if they were interested in going in a medical direction we could put forward SBIS phase 1 and Phase 2 and get federal funding". Chairperson Landwehr mentioned she asked them to come to tell us what is happening in the state of Kansas to show we are a lot more than a flat state with cows and grass. When 911 occurred we were the 3<sup>rd</sup> hardest hit city in the country because of reliance on the aircraft industry. 2 years later we were number 1. These smaller tier 1 and tier 2 manufacturers are largely impacted by the effects of the economy. So I think to see us have the ability for these tier 1 and tier 2 manufacturers to have the ability to make something besides aircraft parts is a very exciting thing, not only for the Wichita community but also for the state of Kansas. Then maybe we can level off the economic roller coaster that our community seems to drive down there. You can look at the school districts and see the effects. When the aircraft industry numbers are up the enrollment in schools are up and when the industry is down, enrollment is down.

Chairperson Landwehr adjourned the meeting at 2:22 p.m.

**HOUSE HEALTH AND HUMAN SERVICES  
COMMITTEE GUEST LIST**

**DATE: February 5, 2008**

<b>NAME</b>	<b>REPRESENTING</b>
Paul Wooley	Via Christi
David McDonald	Wichita State University
Eric Sexow	wsu
Mary Ellen Conlee	Via Christi
Robert Snoot	
Kari Prasley	Hearney & Associates, Inc.
John Peterson	Capitol Strategies
Lars Olson	WCGME
Julie Hein	HCA

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# Aerospace meets Medicine: Bringing New Jobs to Kansas

**Paul H. Wooley, Ph.D.  
Research Director,  
Orthopaedic Research Institute**

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# Create the Future

**An opportunity to bring lasting  
medical relevance to orthopedic  
medicine for generations to come**

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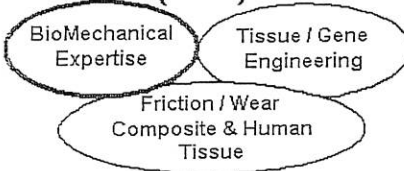


# Leading the Future of Research



Via Christi Research + Wichita State University

(ORI)



(NIAR)

composite research projects since 1995  
bone cement composite testing  
and fixation devices

70% of FAA budget in 2006 for  
composite testing spent at NIAR

## Kansas Bioscience Initiative

March 27, 2004

**Kansas Bioscience Authority**

\* Grant Decisions Made by BOD

**KansasBio**

\* Marketing/PR Function

## Center of Innovation for Biomaterials in Orthopaedic Research

**VCR/ORI + WSU/NIAR = CIBOR**

Translating Aerospace Composites to Orthopaedic Applications  
WATC (near Jabara Airport) plus bricks and mortar donated

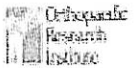
- Sedgwick County Commission
- City of Wichita
- Chamber of Commerce
- Greater Wichita Economic Development Corp.
- Big 5 Aerospace Companies
- WSU Animal Lab

## BioComposites Planning Grant (KBA RFP)

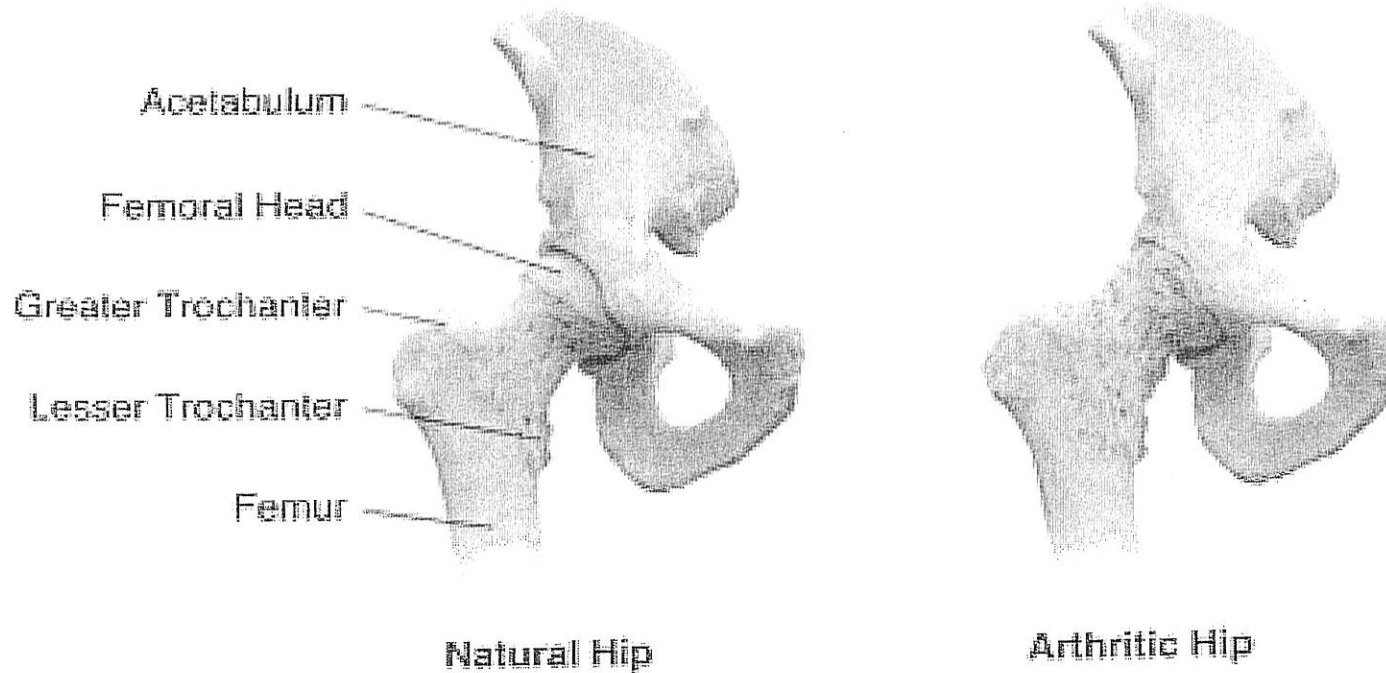
- \$200,000
- Proposal due 10/13/07; award date is 12/21/07
- \$1/\$1 match or in-kind

## Center of Innovation Grant

- Seven bioscience specialty clusters in Kansas
- KBA will fund no more than one proposal from each cluster
- \$20M potential KBA support over 10 years per center
- The best cluster for our skill set is biomaterials/biocomposites



# Osteoarthritis



# Arthritis Demographics

American Academy of Orthopaedic Surgeons

1999 - 2004 Physician Visits for Arthritis

ICD-9-CM	Description	Year	Total Number of Physician Visits	Female Patients:		Male Patients:	
				Total	%	Total	%
715.xx	Osteoarthritis and Allied Disorders	1999	13,853,000	10,294,000	74%	3,559,000	26%
		2000	15,084,000	10,490,000	70%	4,595,000	30%
		2001	19,726,000	12,176,000	62%	7,550,000	38%
		2002	18,020,000	11,781,000	65%	6,240,000	35%
		2003	18,943,000	12,725,000	67%	6,218,000	33%
		2004	17,426,000	10,727,000	62%	6,699,000	38%

# The History of Joint Replacement

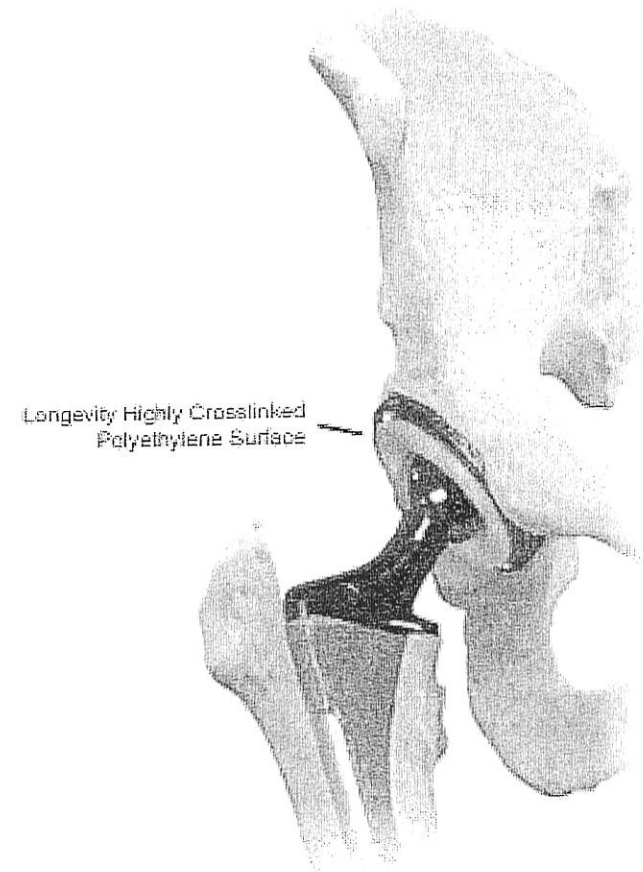
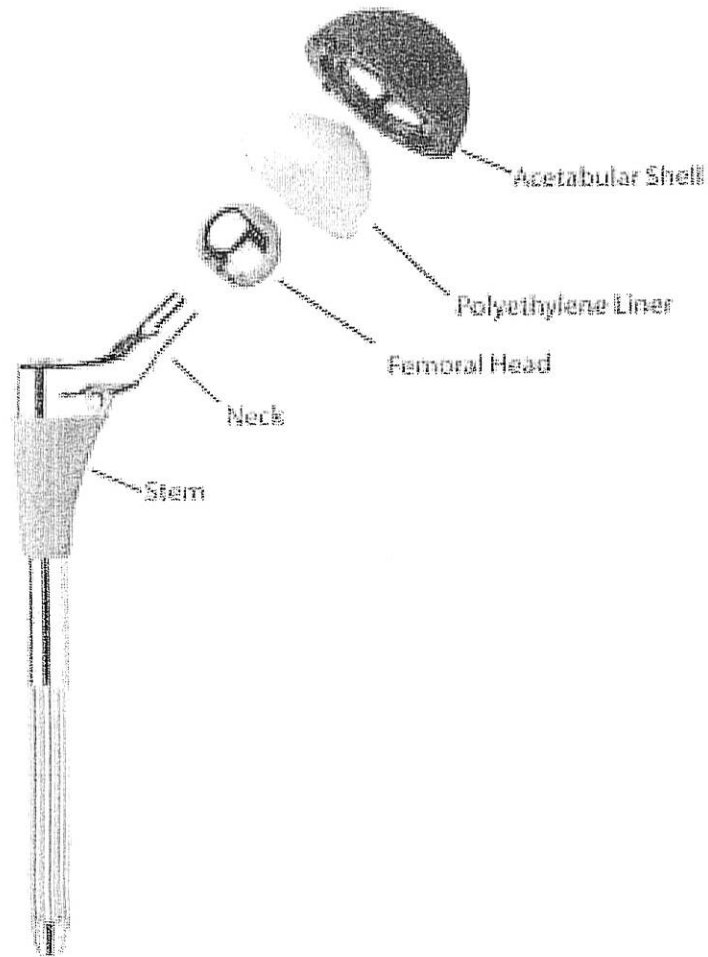


Sir John Charnley (1911-1982)

- In November 1962 the Charnley hip replacement became practical reality and has become the gold standard for this form of treatment.
- Clinical and radiographic success of this procedure is now approaching 46 years of follow-up.
- "The total hip replacement operation has been seen as a landmark in 20th-century surgery, and is now one of the most performed elective surgical procedures in the world."

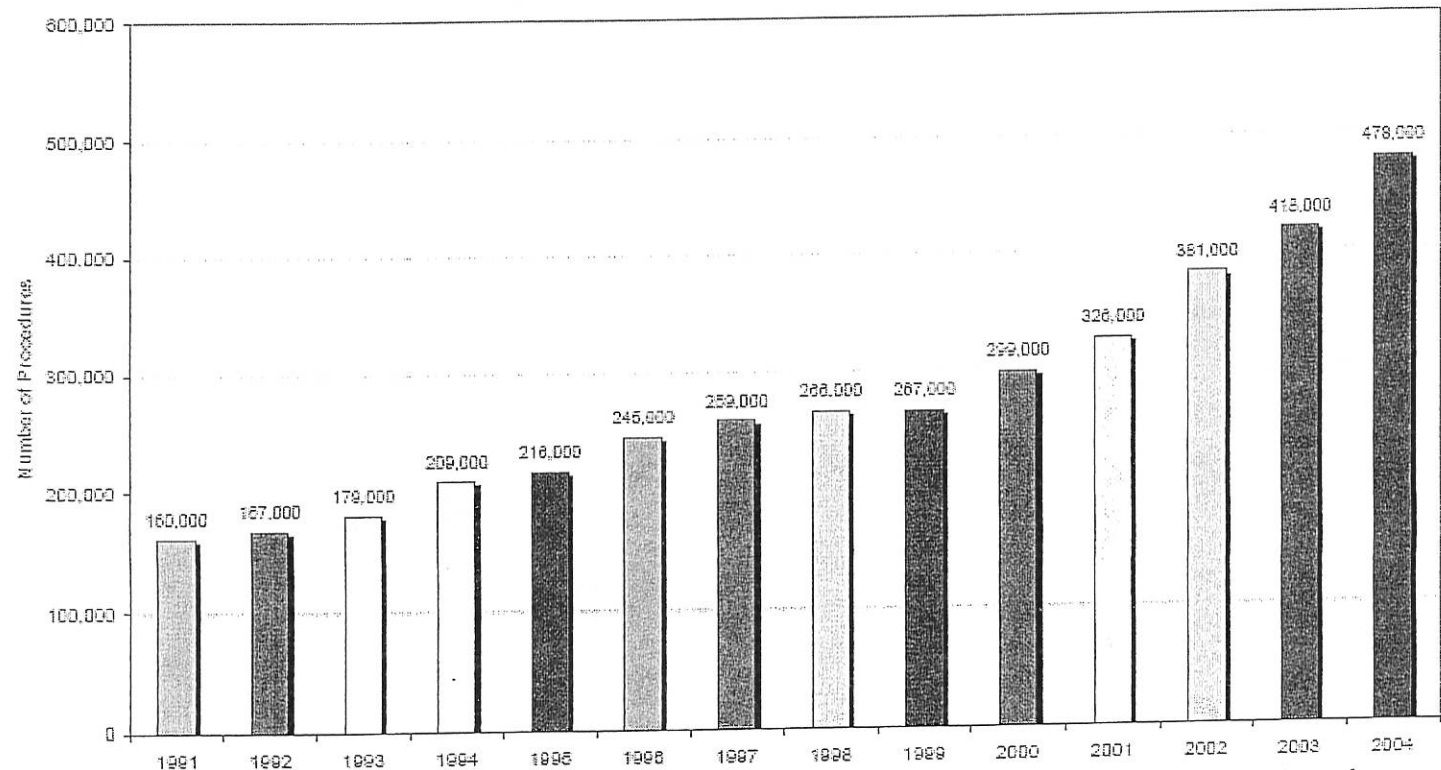


# Total Hip Replacement



# Number of Joint Replacements

Number of Total Knee Replacement Procedures  
(ICD-9-CM Procedure Code: 81.54)



Source: National Hospital Discharge Survey, 1991 - 2004; available from the U.S. Department of Health and Human Services; Centers for Disease Control and Prevention; National Center for Health Statistics

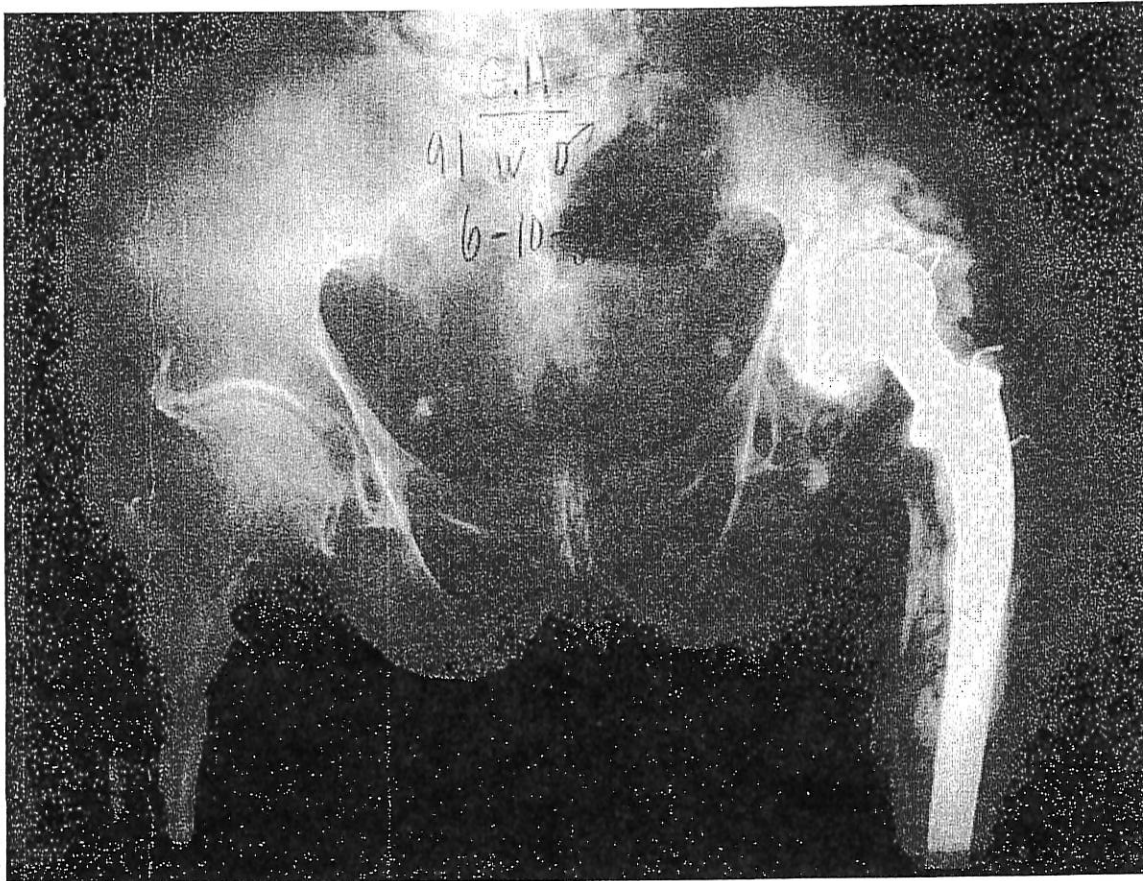
# Outcome of Joint Replacements

- Excellent pain relief and restoration of function in >90% of patients at 7 years
- Implants can fail in less than 2 years due to material issues
- Patients are receiving implants at a younger age and requiring high performance materials
- In the younger patients, 30% of implants will require revision ~15 years after surgery\*

□ \* Keener et al, JBJS 2003

# Failure of current implants

## (1) Stress shielding



- Bone requires activity to be healthy; 'use it or lose it' properties.
- Metals shield bone from the benefits of stress.
- Using most current implants, bone loss will occur.

# Failure of current implants

## (2) Material Wear Debris

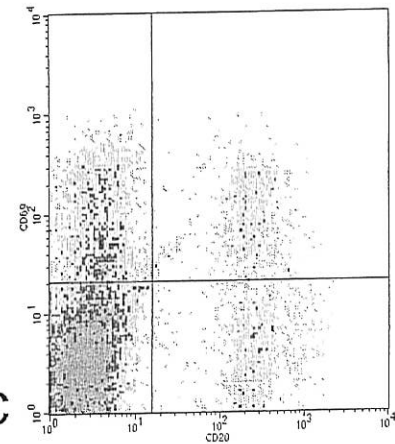
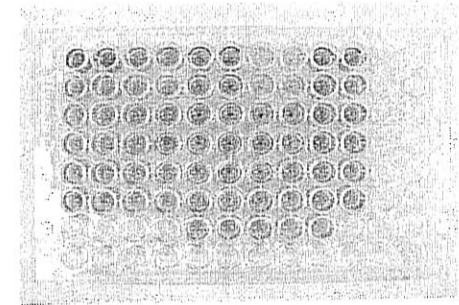
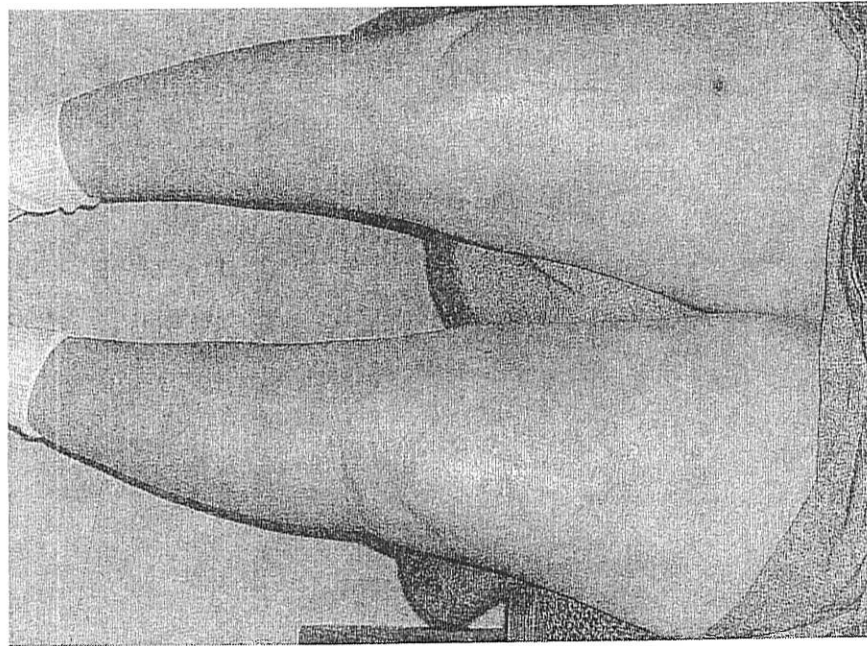


Particles from the metal and plastic cause inflammation leading to bone loss and failure of the implant



# Failure of current implants

## (3) Material Sensitivity



Allergic-like reactions to orthopaedic metals and plastics can lead to bone loss and failure of the implant

# Revision Surgery:

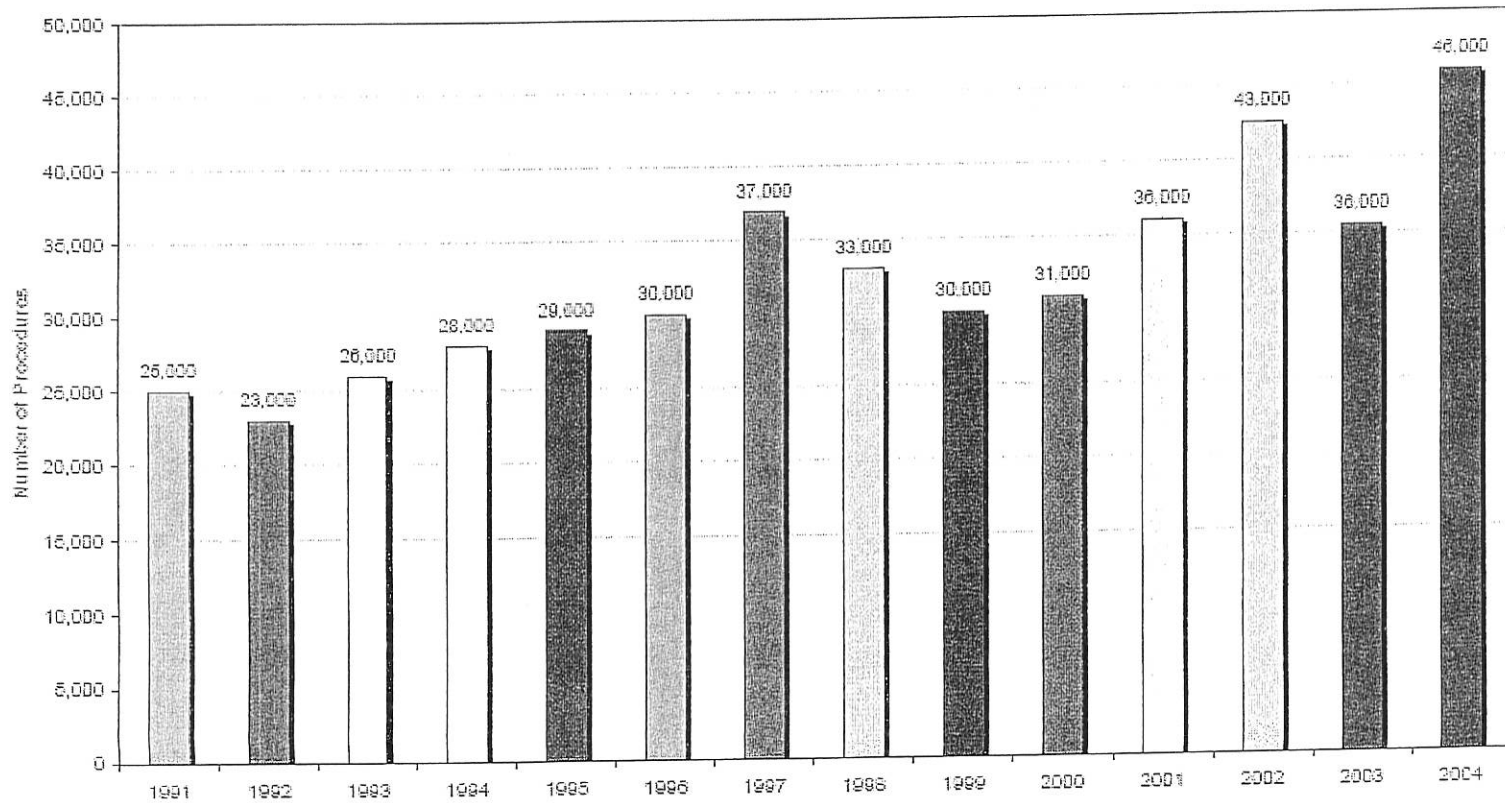
## Replacement of the original device

- Orthopaedic devices need to last a lifetime.
- The operative cost of revision surgical procedures are 41% higher than primary surgery
- Hospital stays are 2 days longer, and rehabilitation is significantly slower
- The complication rate (particularly infections) is 32% higher than primary surgery
- Patient pain and suffering

□ Bosiz *et al*, JBJS 2005

# Number of Revision Surgeries

Number of Revision Hip Replacement Procedures  
(ICD-9-CM Procedure Code: 81.53)



Source: National Hospital Discharge Survey, 1991-2004; available from the U.S. Department of Health and Human Services; Centers for Disease Control and Prevention; National Center for Health Statistics



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# Why we need a new generation of implants

- The baby-boomer population is not tolerant of health situations that limit their activities
- They demand early surgical intervention and outcomes that preserve their quality of life
- Current implants are limited in lifespan and do not permit high activity levels

# Objectives for the new generation of orthopaedic devices

- Long lifespan
- Low revision rate
- Performs like natural bone
  - Biocompatible in material & modulus
- Rapid recovery
  - Fast implant integration
- Adaptable across a broad range of devices

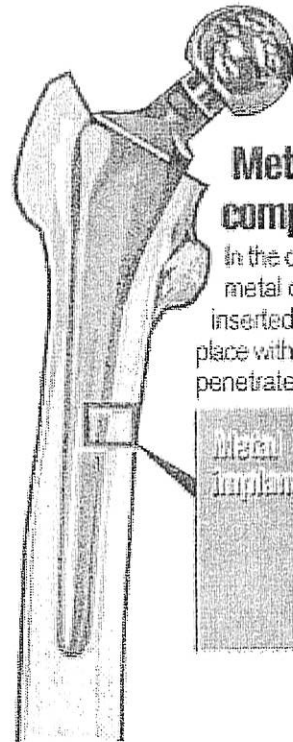
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# Properties of an Ideal Implant

- Close match to the physical properties of bone.
- Close match to the biological properties of bone
- Allows native bone cells to integrate and solidify the interface of the bone to implant
- Highly biocompatible – supports cell and tissue survival

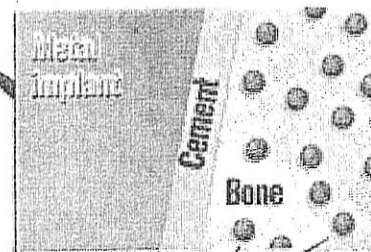
# Composites and tissue engineering

Composite materials like those engineered in Wichita for aviation use have already revolutionized orthopedic medicine. Wichita's composite engineering experts will join forces with Paul Wooley's team of experts in tissue engineering to develop new hybrid implants.

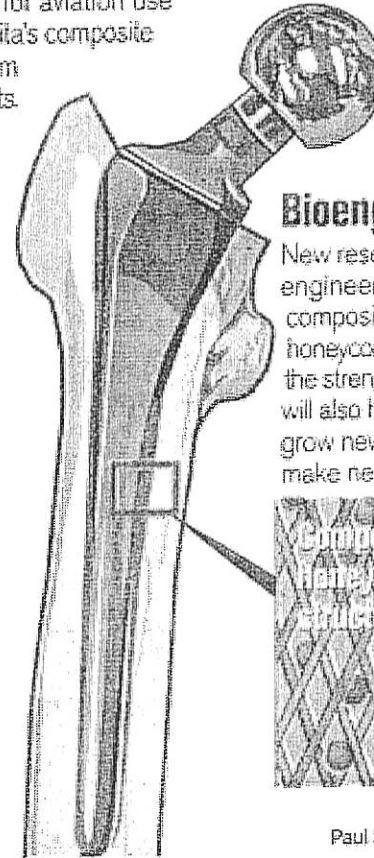


## Metal or solid composite implant

In the conventional implant, a solid metal or composite stem is inserted into the bone and held in place with cement. Bone cells cannot penetrate the solid stem.

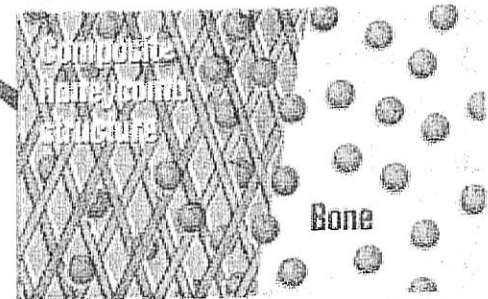


Bone cells



## Bioengineered implant

New research using composites and tissue engineering may truly blend manmade composites and human tissue. A composite honeycomb implant is engineered to preserve the strength of the bone. The new composite will also have biochemical attractants to help grow new bone cells in the composite to make new bone.



Source: Paul Wooley

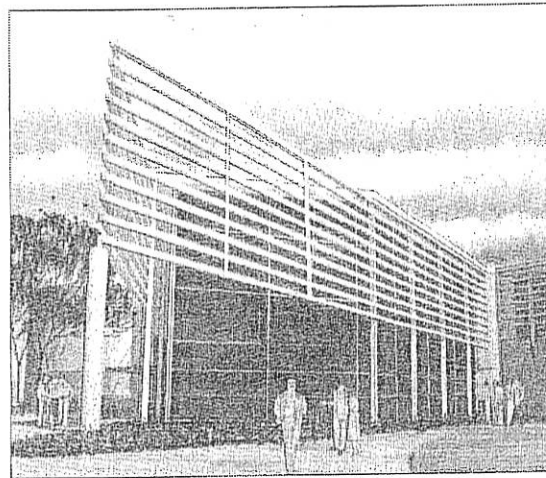
Paul Soutar and Mike Sullivan/The Wichita Eagle

# What is needed for the new generation of composite implants?

- Composite materials expertise
  - *biomaterials*
- Evaluation of biological properties
  - *biocompatibility*
- Testing of material properties
  - *bioengineering*
- Leading Orthopaedic Surgeons
  - *Biodesign*
- Experienced implant manufacturing
  - *Bioproduction*

# These experts are in Wichita.

wichitabusinessjournal.com | JANUARY 4, 2008



The Center for Aviation Training at Jabara Airport is designed to support Wichita's aviation/manufacturing industry.



## Training center contractor to be chosen soon; ground broken in March

BY ADAM HOPP

Wichita already boasts being Air Capital of the World, but the Center for Aviation Training at Jabara Airport is expected to cement that reputation.

It is being billed as a world-class campus with a



Sedgwick County is also anticipating \$3 million from Wichita Area Technical College, which it named a managing partner for Jabara last year.

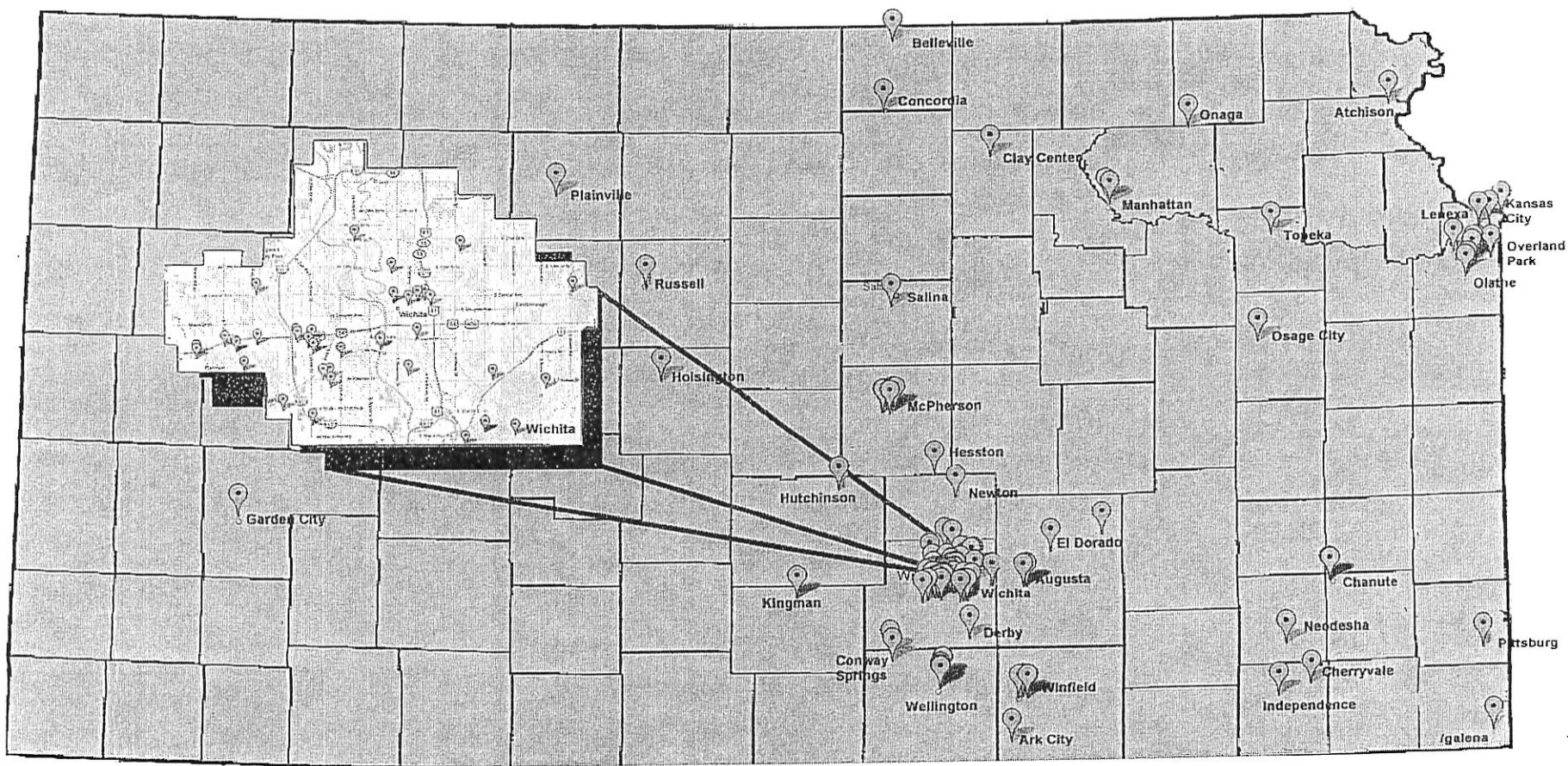
That in essence reduces the cost to about \$37 million.

The facility will be built on a two-parcel, 30-acre site at the Col. James Jabara Airport. The finalized square footage of the

1-20



# A Unique Cluster of Composite Manufacturing Facilities



RESEARCH AND DEVELOPMENT  
COMPOSITE MATERIALS  
ADVANCED TECHNOLOGIES

Raytheon manufactured the all-composite Beech Starship turboprop in the 1980s



Spirit Aerosystems is building the forward fuselage of the Boeing 787 from composite material



PHOTO COURTESY OF CESSNA AIRCRAFT COMPANY



Cessna's Citation X is recognized for its innovative incorporation of composite materials

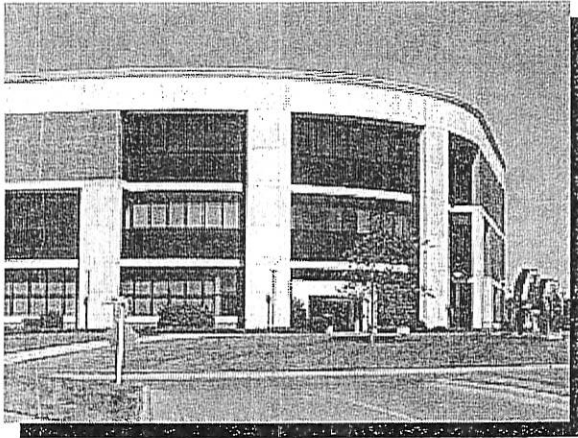
About 20% of Bombardier's CSeries Regional Jet will be of composite construction



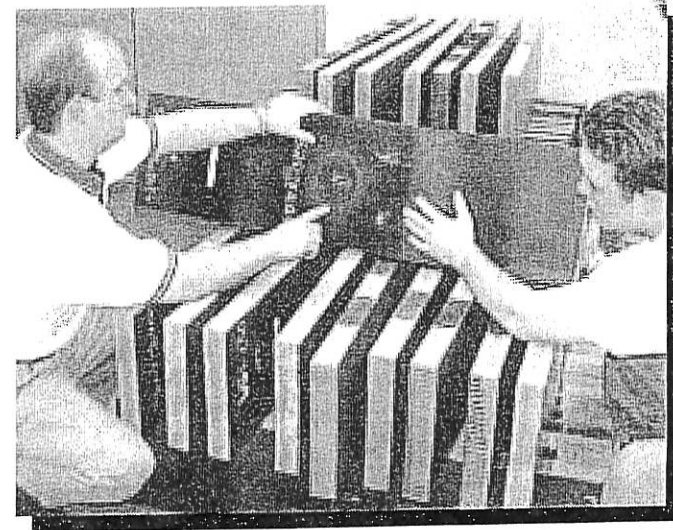
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# Composite materials expertise

WSU is home to  
the National Institute  
of Aviation Research (NIAR)



NIAR houses the  
Center for  
Composites and  
Advanced Materials  
Performance



# Bringing a new industry to Kansas

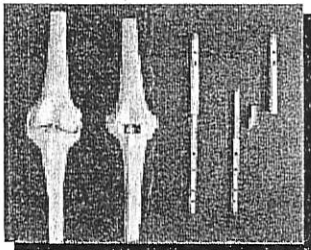
- NIAR is already well-configured to conduct composite research. As one measure of its activity in this area. It currently accounts for over 70% of all FAA-related composite research spending. No other US research institute is over 10%.
- WSU life sciences and engineering has a good core of faculty working in the basic research foundations and is moving to add more strength in key areas as they are identified.

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# Bringing a new industry to Kansas

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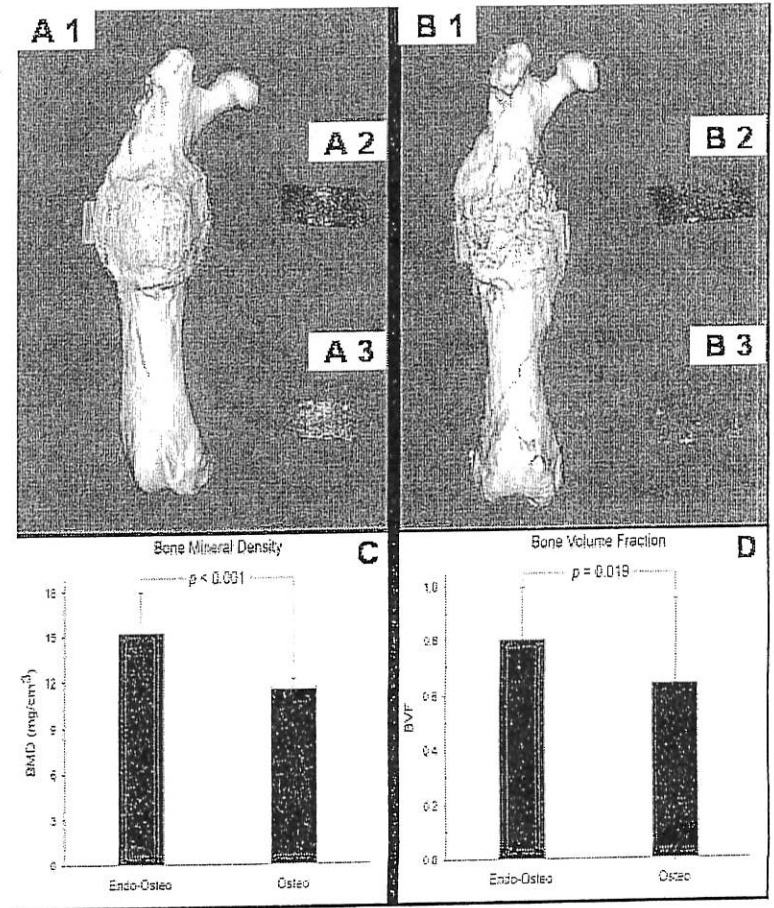
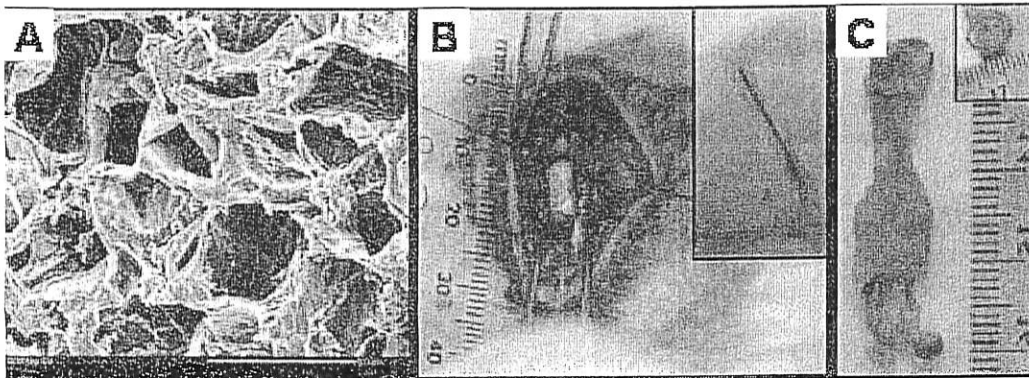
- In Via Christi's Orthopaedic Research Institute, there is an established partnership with Wichita State University to explore the potential of bio-composites for bone and joint repair.



The Wichita Nail

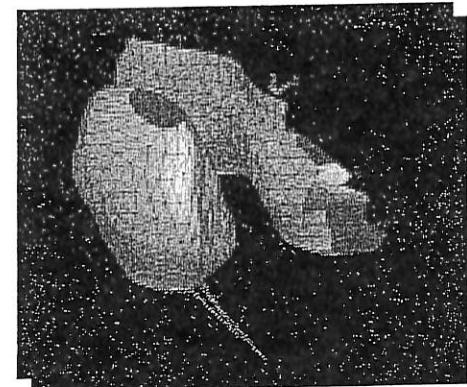
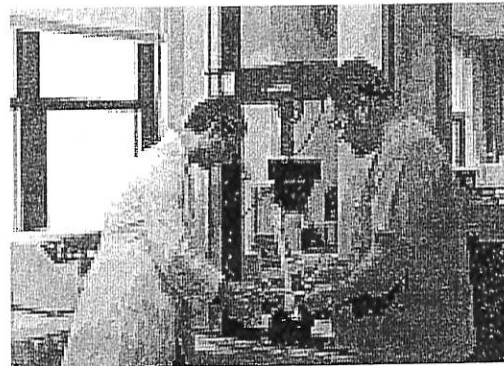
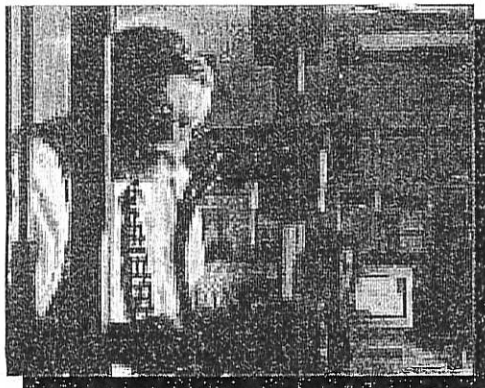
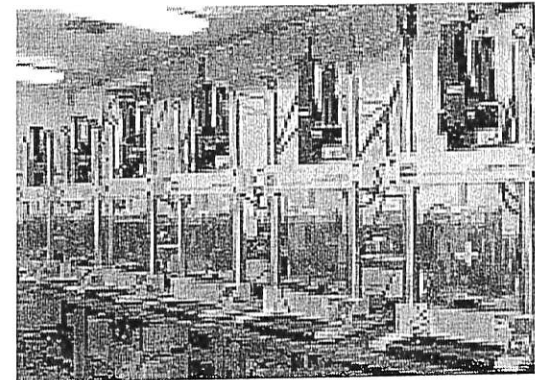
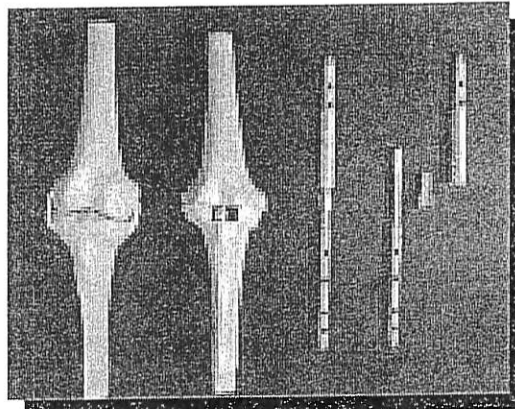
# Evaluation of biological properties

Orthopaedic  
Research Institute &  
Wichita State University



# Testing of Material Properties

□ Orthopaedic Research Institute



# Leading Orthopaedic Surgeons

- Under the leadership of David A. McQueen, MD, ORI Medical Director, a new intramedullary compression device has been designed and developed by the engineers at the Institute. The new device, called the Wichita Fusion Nail, consists of a three-component intramedullary rod which stabilizes the knee against all modes of motion during healing. It is designed to provide compression across the fusion during walking as well as at the time of surgery.



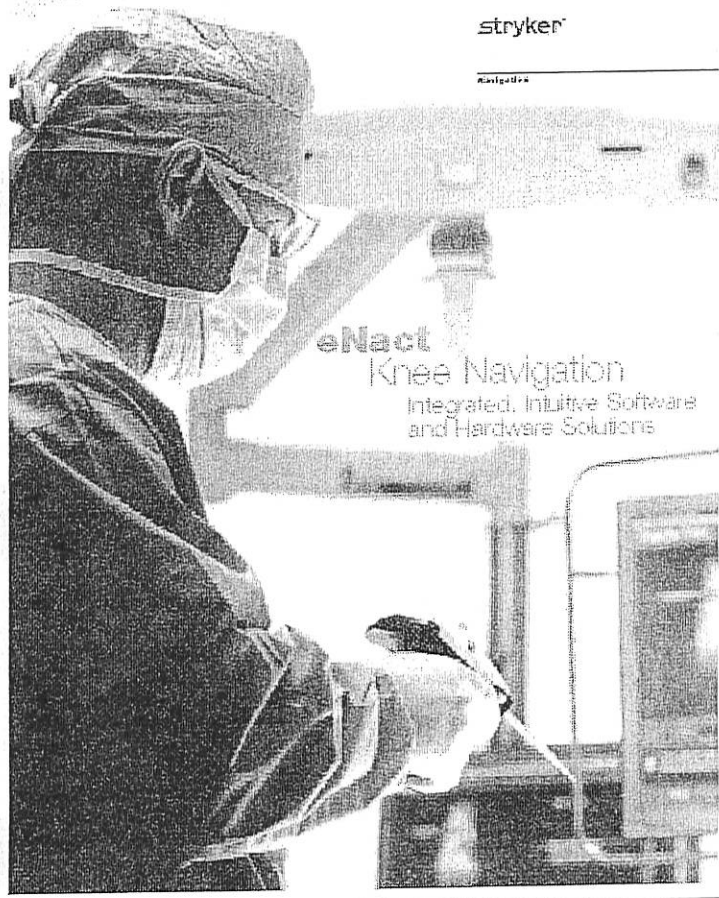
“We’ve done it before, we can do it again.”

# Experienced implant manufacturing

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**stryker**

- Joint Replacements
- Trauma
- Spine
- Micro Implants
- Orthobiologics
- Instruments
- Interventional Pain
- Navigation
- Endoscopy





# Center of Innovation for Biomaterials in Orthopaedic Research (C.I.B.O.R.)

□ A planning grant proposal submitted to the Kansas Bioscience Authority for a Biomaterials Center of Innovation has recently been approved for funding.

□ In this effort, **WSU** and **KU** are Co-Leads; partnered with:

□ **Via Christi Research**

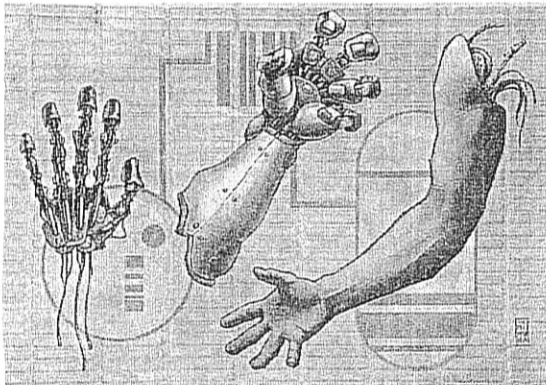
(through their Orthopaedic Research Institute)

□ **Kansas State University**

(through their Vet School and BIVAP)

□ **Pittsburg State University**

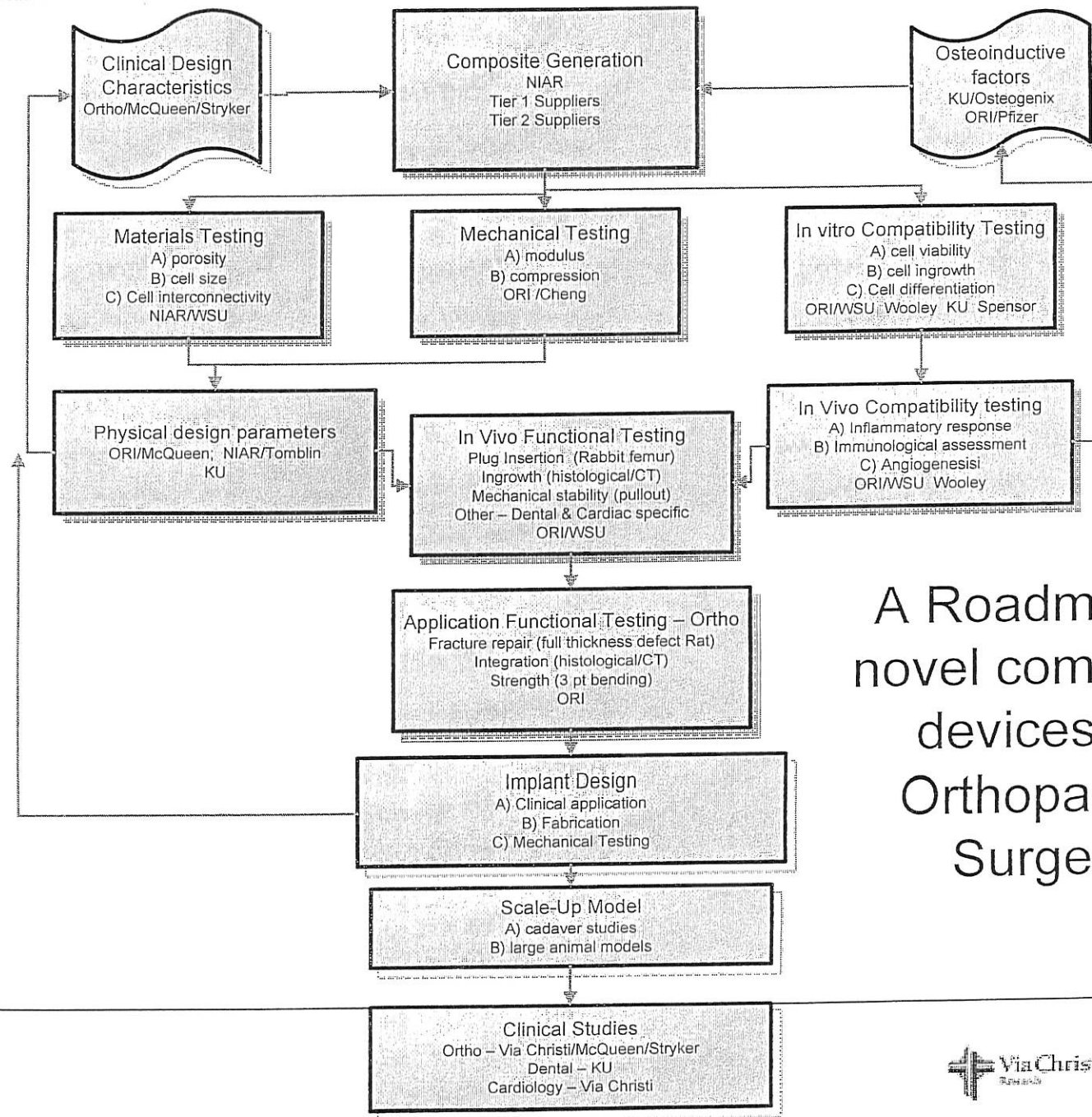
(through their Polymer Research Institute)



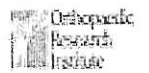


# The Collaborative Effort

- University of Kansas will provide:
  - Basic science innovations to drive osteo-induction
  - The Orthopaedic Residency Program (Wichita) will promote surgeon input and disseminate information
- WSU will provide:
  - NIAR skills in composites and industrial application
  - Translational abilities in life sciences and engineering
- ORI & Via Christi will provide:
  - Biocompatibility and bioengineering assessments
  - Orthopaedic surgery innovations & applications
  - Links to major orthopaedic implant manufacturers
- Kansas State University will provide:
  - Veterinary applications and expertise
- Pittsburgh State University will provide:
  - Advances in polymer science



# A Roadmap to novel composite devices for Orthopaedic Surgery



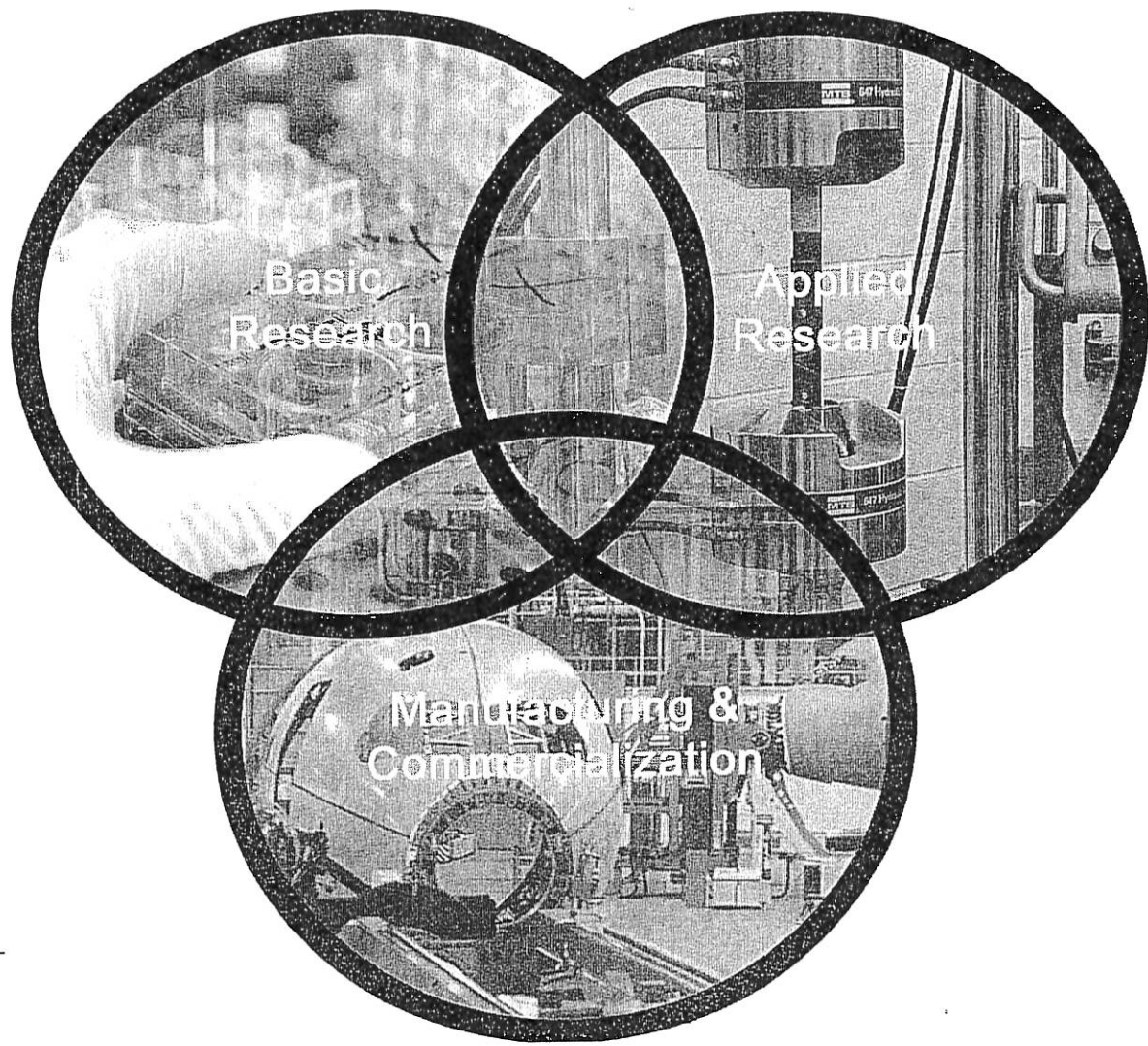
# Extending the Vision

- Composites are not limited to orthopaedic surgery, but may be useful in any medical device
- Composite nanotechnology will permit 'smart' devices to combat infection and promote organ-specific tissue integration.
- We intend C.I.B.O.R. to be accessible to any surgeon, scientist, or implant manufacturer to promote bench-to-clinic translational research
- C.I.B.O.R.'s scientific, educational, and industrial opportunities are mutually supportive.

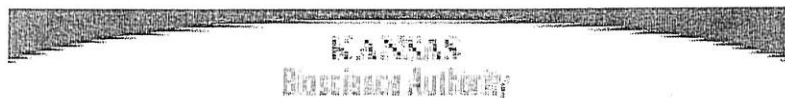
# How You can Help Us!

- Goal: To bring a new, lucrative, non-cyclical industry to Kansas
- Strategy: Advocate the location with the experts, companies, relationships, and capabilities to maximize the likelihood of attracting new manufacturing facilities

# The Strengths of Wichita



Thank You.



**KANSASBIO**  
KANSAS BIOSCIENCE ORGANIZATION



**Via Christi**  
Research



**Orthopaedic  
Research  
Institute**

