

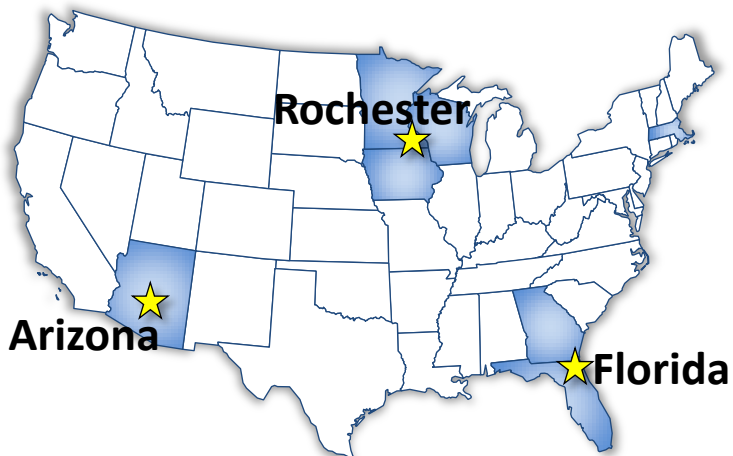


Biomechanics Laboratory and Orthopaedic Department

Peter.amadio@mayo.edu

Mayo Clinic Foundation for Medical Education and Research

What is the mayo Clinic ?



Mayo Clinic Foundation for Medical Education and Research

- The vision of two brothers, their father, and the Sisters of St Francis

- **Mission**

- To inspire hope and contribute to health and well-being by providing the best care to every patient through **integrated clinical practice, education and research.**

- **Primary value**

- The needs of the patient come first (“the only interest to be considered” - WH Mayo)

- Not for profit (all net revenues are reinvested in research and education, or to expand the practice)
- Salaried staff



- Physician led
- Most recognized brand in medicine
- 1.3 million patients per year (3% international)
- 4500 staff physicians
- 230 staff scientists
- \$12.6 billion annual revenues (\$700 million net)
- \$750 million research budget
- 1800 resident physicians, 250 PhD students, 250 medical students, 1800 other students

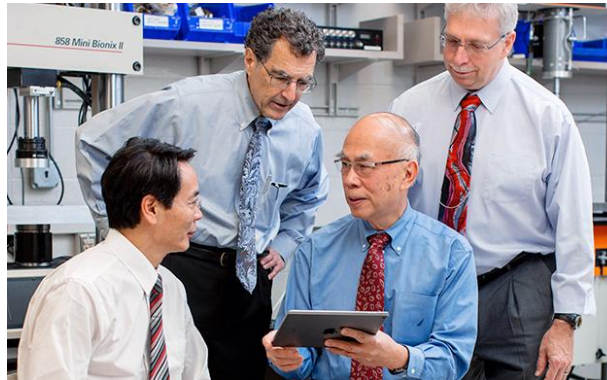
Biomechanics Lab and Orthopedic department

Orthopedic Department

- Established in 1910
- First hip replacement in USA (1969)
- Total Joint Registry (all joint replacements at Mayo since 1969, with follow up at 5 year intervals)
- Currently with 64 faculty
 - 7 PhD scientists;
 - 32 full professors
- 100,000 clinic visits and 14,000 surgical procedures/year
- 14 major NIH ("R01") grants held by 6 PhD scientists and 5 clinicians
- \$12.5 million annual research budget (10% royalty reinvestment, 10% gifts, 30% Mayo; 45% federal, 5% industry)

Biomechanics Lab(s)

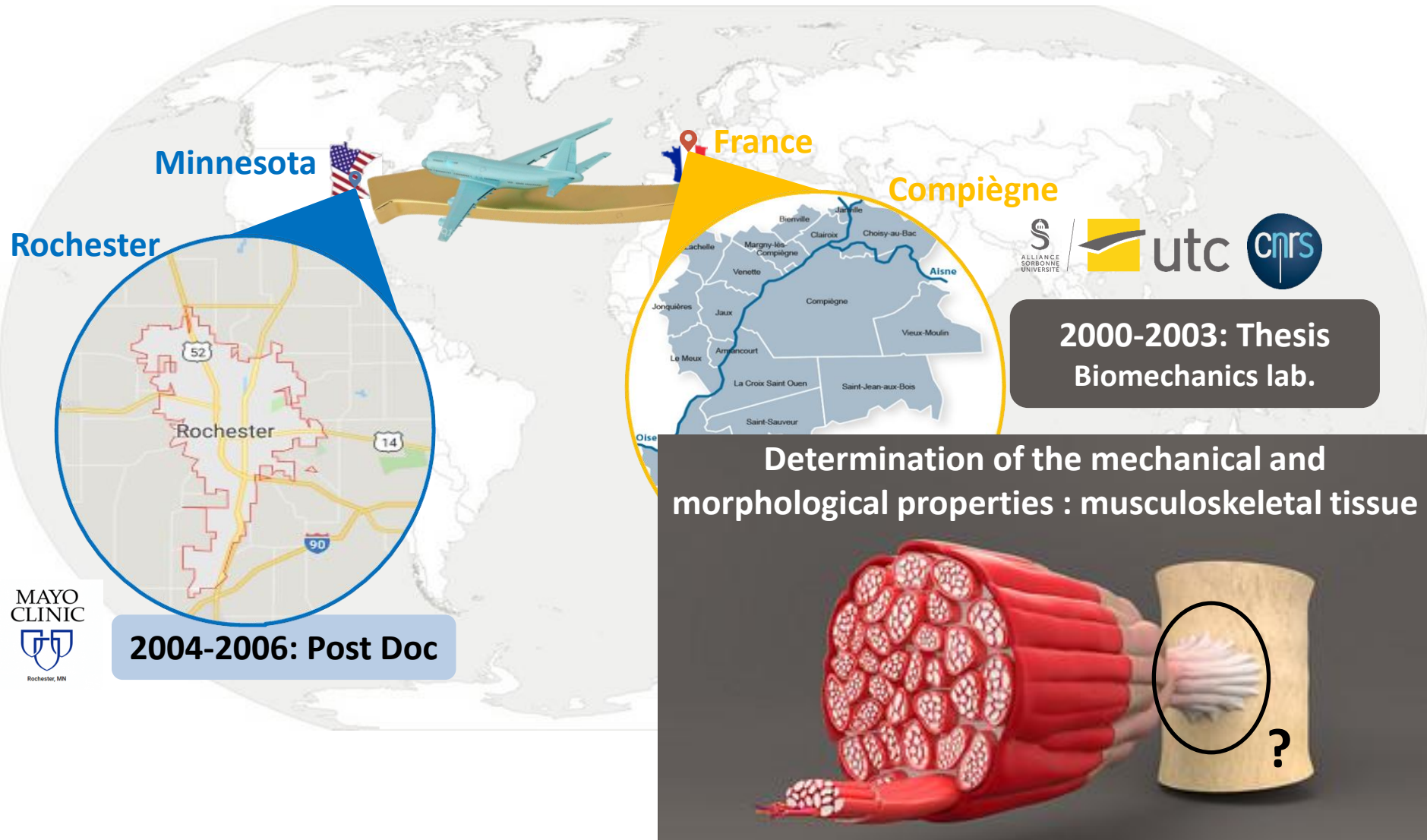
- Founded by EYS Chao in 1974
- Kai An 1994-2014
- Tim Hewett 2015-present
- Motion Analysis Lab (KR Kaufman)
- Tendon and Soft Tissue Biology lab (PC Amadio, C Zhao, A Gingery)



Bone biology and histomorphometry Lab(s)

- Founded by PJ Kelly in 1966
- JJ Westendorf, A van Wijnen, M Yaszemski, E Bradley, AT Bishop, AY Shin, M Abdel labs

How the story with the Mayo Clinic has started



How the story with the Mayo Clinic has started

Minnesota

Rochester



2004-2006: Post Doc



Dr Amadio



Dr An



Orthopedic Biomechanics
Laboratory
Room Gu 1-28

Orthopedic Biomechanics
Laboratory
Room Gu 1-28



Dr Ehman



Dr An



Dr Amadio

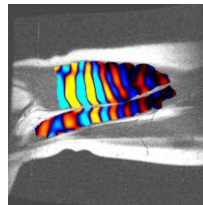
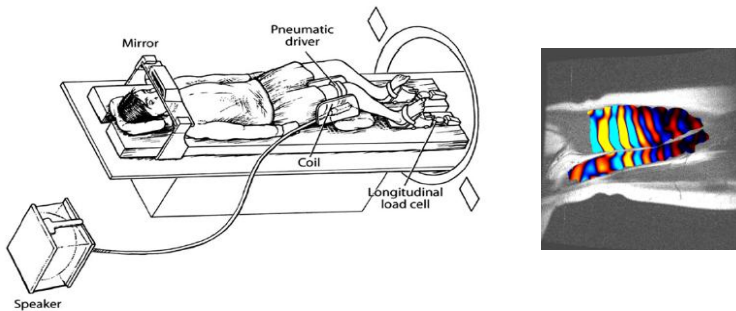


Dr Spelsberg
(retired)



Dr Hawse

Elastography development
for muscle → thigh

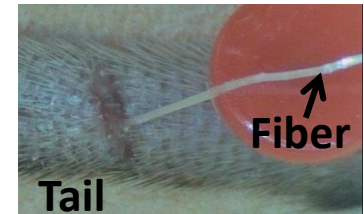
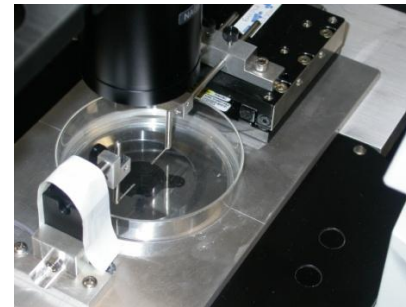


Set up of elastography platform
Muscle and liver applications

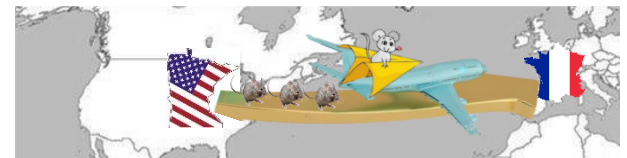


Role of TIEG1 in tendon

Development mechanical test



New role of TIEG1 in muscle



Orthopedic Biomechanics
Laboratory
Room Gu 1-28

Retired
Emeritus



Dr An



Dr Amadio

2006: Post doc



14 years after



2019: Research collaborator



R. Ternifi M. Kammoun

Potential project with the Orthopedic Biomechanics Laboratory

TSTB Lab current research interests

- Tendon lubrication
- **Tendon tissue engineering** (Zhao)
- Tendinopathy (Gingery)
- Carpal tunnel biology and aging (Gingery)
- **US imaging** of carpal tunnel

mechanical biomarkers to individualize treatment of carpal tunnel syndrome (“sorting hat”)

- Median nerve **stiffness (SWE)**
- Relative motion of nerve, **tendons**, synovial tissue; **shear index**



Collaboration with S Bensamoun

- TGF Inducible Early Gene (TIEG) studies- effect of TIEG knockout on tendon mechanics
- MR Elastography

Collaborations

- Mayo Clinic's Office of External Research Collaborations is responsible for the development of formal collaborations that go beyond investigator-to-investigator collaborations, and include formal agreements on sharing of intellectual property, data, resources, and funds
- Examples of Mayo interinstitutional collaborations include Karolinska Institutet, Arizona State University

