Stanford

Feliks Kogan

Assistant Professor (Research) of Radiology (Musculoskeletal Imaging)

NIH Biosketch available Online

Bio

BIO

Dr. Kogan is an Assistant Professor with a research focus on imaging of musculoskeletal function and disease. He earned his PhD in Bioengineering at the University of Pennsylvania in 2013 during which he received a HHMI interfaces fellowship and completed the pre-clinical academic curriculum at the UPenn School of Medicine. Afterwards, he did his postdoctoral fellowship in the Radiology Department at Stanford. His group is focused on the development of early markers of disease with novel imaging methods, and the translation of these methods to produce actionable information to impact patient outcomes. He has extensive experience with cutting-edge imaging technologies including multimodal PET-MRI systems, novel quantitative imaging biomarkers and Ultra-high magnetic field (7T). In addition to research, Dr. Kogan has taught lectures in numerous courses at Stanford. He is a junior fellow of the International Society for Magnetic Resonance in Medicine and a member of Council of Early Investigators in Imaging of the Academy for Radiology & Biomedical Imaging Research.

ACADEMIC APPOINTMENTS

- Assistant Professor (Research), Radiology
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance

HONORS AND AWARDS

- NIBIB Trailblazer Award, National Institutes of Health (NH) (2020)
- NIH Pathway to Independence Award (K99/R00), National Institutes of Health (NIH - NIBIB) (2017)
- Young Investigator Cum Laude Award (W. S. Moore Award Finalist), International Society of Magnetic Resonance in Medicine (2017)
- ISMRM Junior Fellow, International Society of Magnetic Resonance in Medicine (2015)
- Council of Early Investigators in Imaging (CECI2), Academy for Radiology & Biomedical Imaging Research (2018)
- National Institute of Biomedical Imaging and Bioengineering (NIBIB) Training Grant, National Institute of Health (NIH) (2010)
- HHMI Interfaces Fellowship in Imaging Sciences, Howard Hughes Medical Institute (HHMI) (2007)
- Distinguished Reviewer, Magnetic Resonance in Medicine (2019)
- Top-5 (#4) Most Cited Articles of 2014, Magnetic Resonance in Medicine (2017)
- Young Investigator Award, International Workshop on Osteoarthritis Imaging (2017)
- Distinguished Reviewer, Journal of Magnetic Resonance Imaging (2016, 2017)
- Editors Recognition Award (Top 10 Most Downloaded Articles), Current Radiology Reports (2016)
- Editors Pick Article, Magnetic Resonance in Medicine (2015)
- Merit Award for Highest Scoring Trainee Abstract, International Workshop on OA Imaging (IWOAI) (2015)

- Summa Cum Laude Merit Award, International Society of Magnetic Resonance in Medicine (2012, 2015)
- Graduate Fellowship (Honorable Mention), National Science Foundation (NSF) (2007)

PROFESSIONAL EDUCATION

- B.S, University of Rochester , Optics, Applied Math (2007)
- Ph.D, University of Pennsylvania , Bioengineering (2013)
- Postdoctoral Fellowship, Stanford University , Radiology (2015)

LINKS

- Imaging of Musculoskeletal Function Group Website: https://med.stanford.edu/imfgroup.html

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My research is focused on the development and clinical translation of novel quantitative and molecularly specific imaging technologies geared toward detection of disease at the earliest causative stages. Specifically, I am motivated to study the causes and treatment of osteoarthritis (OA) and other musculoskeletal disorders, which have a large physical and financial impact but remain poorly understood. Research projects include development of (1) novel PET and MRI imaging methods to study early tissue changes at the cellular and molecular level, (2) functional imaging methods to study important relationships between mechanics, physiology and tissue microstructure, (3) rapid, comprehensive and quantitative MRI methods for early, low-cost, and precise detection of musculoskeletal disease.

CLINICAL TRIALS

- Use of PET/MR Imaging in Chronic Pain, Not Recruiting

Teaching

COURSES

2023-24

- Seminar Series for Biomedical Physics: BMP 210, RAD 210 (Aut)

2022-23

- Biomedical Signals I: BMP 211, RAD 211 (Aut)
- Seminar Series for Biomedical Physics: BMP 210, RAD 210 (Aut, Spr)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Marco Barbieri, Olivia Bruce

Doctoral Dissertation Advisor (AC)

Ananya Goyal, Laurel Hales

Publications

PUBLICATIONS

- **[18F]Sodium Fluoride PET-MRI Detects Increased Metabolic Bone Response to Whole-Joint Loading Stress in Osteoarthritic Knees.** *Osteoarthritis and cartilage*
  Watkins, L. E., Haddock, B., MacKay, J. W., Baker, J., Uhlrich, S. D., Mazzoli, V., Gold, G. E., Kogan, F.
  2022

- **Non-contrast MRI of synovitis in the knee using quantitative DESS.** *European radiology*
  Thoenen, J., Stevens, K. J., Turmezei, T. D., Chaudhari, A., Watkins, L. E., McWalter, E. J., Hargreaves, B. A., Gold, G. E., MacKay, J. W., Kogan, F.
  2021
- **[18F]NaF PET-MRI provides direct in-vivo evidence of the association between bone metabolic activity and adjacent synovitis in knee osteoarthritis: a cross-sectional study.** *Osteoarthritis and cartilage*
  MacKay, J., Watkins, L., Gold, G., Kogan, F.
  2021
- **Assessment of acute bone loading in humans using [18F]NaF PET/MRI.** *European journal of nuclear medicine and molecular imaging*
  Haddock, B., Fan, A. P., Uhlrich, S. D., Jorgensen, N. R., Suetta, C., Gold, G. E., Kogan, F.
  2019
- **Quantitative imaging of bone–cartilage interactions in ACL-injured patients with PET–MRI** *Osteoarthritis and Cartilage*
  Kogan, F., Fan, A., Monu, U. D., Iagaru, A., Hargreaves, B., Gold, G.
  2018; 26 (6): 790-796
- **Quantitative imaging of bone-cartilage interactions in ACL-injured patients with PET-MRI.** *Osteoarthritis and cartilage*
  Kogan, F. n., Fan, A. P., Monu, U. n., Iagaru, A. n., Hargreaves, B. A., Gold, G. E.
  2018
- **Simultaneous bilateral-knee MR imaging.** *Magnetic resonance in medicine*
  Kogan, F. n., Levine, E. n., Chaudhari, A. S., Monu, U. D., Epperson, K. n., Oei, E. H., Gold, G. E., Hargreaves, B. A.
  2018; 80 (2): 529–37
- **PET/MRI of Metabolic Activity in Osteoarthritis: A Feasibility Study** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
  Kogan, F., Fan, A. P., McWalter, E. J., Oei, E. H., Quon, A., Gold, G. E.
  2017; 45 (6): 1736-1745
- **A technique for in vivo mapping of myocardial creatine kinase metabolism.** *Nature medicine*
  Haris, M., Singh, A., Cai, K., Kogan, F., McGarvey, J., Debrosse, C., Zsido, G. A., Witschey, W. R., Koomalsingh, K., Pilla, J. J., Chirinos, J. A., Ferrari, V. A., Gorman, et al
  2014
- **Method for high-resolution imaging of creatine in vivo using chemical exchange saturation transfer.** *Magnetic resonance in medicine*
  Kogan, F., Haris, M., Singh, A., Cai, K., Debrosse, C., Nanga, R. P., Hariharan, H., Reddy, R.
  2014; 71 (1): 164-172
- **Magnetic resonance imaging of glutamate** *NATURE MEDICINE*
  Cai, K., Haris, M., Singh, A., Kogan, F., Greenberg, J. H., Hariharan, H., Detre, J. A., Reddy, R.
  2012; 18 (2): 302-306
- **A deep learning approach for fast muscle water T2 mapping with subject specific fat T2 calibration from multi-spin-echo acquisitions.** *Scientific reports*
  Barbieri, M., Hooijmans, M. T., Moulin, K., Cork, T. E., Ennis, D. B., Gold, G. E., Kogan, F., Mazzoli, V.
  2024; 14 (1): 8253
- **Correction to: Multimodal positron emission tomography (PET) imaging in non-oncologic musculoskeletal radiology.** *Skeletal radiology*
  Kogan, F., Yoon, D., Teeter, M. G., Chaudhari, A. J., Hales, L., Barbieri, M., Gold, G. E., Vainberg, Y., Goyal, A., Watkins, L.
  2024
- **Multimodal positron emission tomography (PET) imaging in non-oncologic musculoskeletal radiology.** *Skeletal radiology*
  Kogan, F., Yoon, D., Teeter, M. G., Chaudhari, A. J., Hales, L., Barbieri, M., Gold, G. E., Vainberg, Y., Goyal, A., Watkins, L.
  2024
- **Advanced Magnetic Resonance Imaging and Molecular Imaging of the Painful Knee.** *Seminars in musculoskeletal radiology*
  Mostert, J. M., Dur, N. B., Li, X., Ellermann, J. M., Hemke, R., Hales, L., Mazzoli, V., Kogan, F., Griffith, J. F., Oei, E. H., van der Heijden, R. A.
  2023; 27 (6): 618-631
- **Advanced MRI Approaches for Evaluating Common Lower Extremity Injuries in Basketball Players: Current and Emerging Techniques.** *Journal of magnetic resonance imaging : JMRI*

Rubin, E. B., Schmidt, A. M., Koff, M. F., Kogan, F., Gao, K., Majumdar, S., Potter, H., Gold, G. E.
2023

- **[Formula: see text] Field inhomogeneity correction for qDESS [Formula: see text] mapping: application to rapid bilateral knee imaging.** *Magma (New York, N.Y.)*
  Barbieri, M., Watkins, L. E., Mazzoli, V., Desai, A. D., Rubin, E., Schmidt, A., Gold, G. E., Hargreaves, B. A., Chaudhari, A. S., Kogan, F.
  2023
- **Design and Rationale of RE-ENERGIZE FONTAN: RandomizEd Exercise iNtERvention desiGned to maximIZE fitness in FONTAN patients.** *American heart journal*
  Tierney, E. S., Palaniappan, L., Leonard, M., Long, J., Myers, J., Dávila, T., Lui, M. C., Kogan, F., Olson, I., Punn, R., Desai, M., Schneider, L. M., Wang, et al
  2023
- **Imaging of joint response to exercise with MRI and PET.** *Skeletal radiology*
  Watkins, L. E., Goyal, A., Gatti, A. A., Kogan, F.
  2023
- **PET Imaging in Osteoarthritis.** *PET clinics*
  Jarraya, M., Roemer, F. W., Bäuerle, T., Kogan, F., Guermazi, A.
  2023; 18 (1): 21-29
- **Latest advancements in imaging techniques in OA.** *Therapeutic advances in musculoskeletal disease*
  Hayashi, D., Roemer, F. W., Link, T., Li, X., Kogan, F., Segal, N. A., Omoumi, P., Guermazi, A.
  2022; 14: 1759720X221146621
- **Editorial for "Local Patterns in Two-Year T1rho and T2 Changes in Hip Cartilage Are Related to Sex and Functional Data: A Prospective Evaluation on Hip Osteoarthritis Participants".** *Journal of magnetic resonance imaging : JMRI*
  MacKay, J., Watkins, L., Kogan, F.
  2022
- **A method for measuring B0 field inhomogeneity using quantitative double-echo in steady-state.** *Magnetic resonance in medicine*
  Barbieri, M., Chaudhari, A. S., Moran, C. J., Gold, G. E., Hargreaves, B. A., Kogan, F.
  2022
- **Generalizability of Deep Learning Segmentation Algorithms for Automated Assessment of Cartilage Morphology and MRI Relaxometry.** *Journal of magnetic resonance imaging : JMRI*
  Schmidt, A. M., Desai, A. D., Watkins, L. E., Crowder, H. A., Black, M. S., Mazzoli, V., Rubin, E. B., Lu, Q., MacKay, J. W., Boutin, R. D., Kogan, F., Gold, G. E., Hargreaves, et al
  2022
- **Gadolinium-free assessment of synovitis using diffusion tensor imaging.** *NMR in biomedicine*
  Sandford, H. J., MacKay, J. W., Watkins, L. E., Gold, G. E., Kogan, F., Mazzoli, V.
  2021: e4614
- **Imaging of Synovial Inflammation in Osteoarthritis, From the AJR Special Series on Inflammation.** *AJR. American journal of roentgenology*
  Thoenen, J., MacKay, J. W., Sandford, H. J., Gold, G. E., Kogan, F.
  2021
- **Characterization of Structural Bone Properties through Portable Single-Sided NMR Devices: State of the Art and Future Perspectives.** *International journal of molecular sciences*
  Barbieri, M., Fantazzini, P., Testa, C., Bortolotti, V., Baruffaldi, F., Kogan, F., Brizi, L.
  2021; 22 (14)
- **Assessment of Quantitative [18F]Sodium Fluoride PET Measures of Knee Subchondral Bone Perfusion and Mineralization in Osteoarthritic and Healthy Subjects.** *Osteoarthritis and cartilage*
  Watkins, L., MacKay, J., Haddock, B., Mazzoli, V., Uhlrich, S., Gold, G., Kogan, F.
  2021
- **Characterizing the transient response of knee cartilage to running: Decreases in cartilage T2 of female recreational runners.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*
  Crowder, H. A., Mazzoli, V. n., Black, M. S., Watkins, L. E., Kogan, F. n., Hargreaves, B. A., Levenston, M. E., Gold, G. E.

2021

- **Effects of the Competitive Season and Off-Season on Knee Articular Cartilage in Collegiate Basketball Players Using Quantitative MRI: A Multicenter Study.** *Journal of magnetic resonance imaging : JMRI*
  Rubin, E. B., Mazzoli, V. n., Black, M. S., Young, K. n., Desai, A. D., Koff, M. F., Sreedhar, A. n., Kogan, F. n., Safran, M. R., Vincentini, D. J., Knox, K. A., Yamada, T. n., McCabe, et al
  2021

- **Diffusion Tensor Imaging of Skeletal Muscle Contraction Using Oscillating Gradient Spin Echo.** *Frontiers in neurology*
  Mazzoli, V. n., Moulin, K. n., Kogan, F. n., Hargreaves, B. A., Gold, G. E.
  2021; 12: 608549

- **Standardized multi-vendor compositional MRI of knee cartilage: a key step towards clinical translation?** *Osteoarthritis and cartilage*
  MacKay, J. W., Roemer, F. W., Kogan, F.
  2020

- **Identifying Musculoskeletal Pain Generators Using Clinical PET.** *Seminars in musculoskeletal radiology*
  Yoon, D. n., Kogan, F. n., Gold, G. E., Biswal, S. n.
  2020; 24 (4): 441–50

- **Rapid volumetric gagCEST imaging of knee articular cartilage at 3 T: evaluation of improved dynamic range and an osteoarthritic population.** *NMR in biomedicine*
  Watkins, L. E., Rubin, E. B., Mazzoli, V. n., Uhlrich, S. D., Desai, A. D., Black, M. n., Ho, G. K., Delp, S. L., Levenston, M. E., Beaupré, G. S., Gold, G. E., Kogan, F. n.
  2020: e4310

- **The prevalence of femoroacetabular impingement anatomy in Division 1 aquatic athletes who tread water** *Journal of Hip Preservation Surgery*
  Langner, J. L., Black, M. S., MacKay, J. W., Hall, K. E., Safran, M. R., Kogan, F., Gold, G. E.
  2020; 0: 1-9

- **Multiparametric MRI Characterization of Knee Articular Cartilage and Subchondral Bone Shape in Collegiate Basketball Players.** *Journal of orthopaedic research : official publication of the Orthopaedic Research Society*
  Gao, K. T., Pedoia, V. n., Young, K. A., Kogan, F. n., Koff, M. F., Gold, G. E., Potter, H. G., Majumdar, S. n.
  2020

- **Rapid Knee MRI Acquisition and Analysis Techniques for Imaging Osteoarthritis.** *Journal of magnetic resonance imaging : JMRI*
  Chaudhari, A. S., Kogan, F., Pedoia, V., Majumdar, S., Gold, G. E., Hargreaves, B. A.
  2019

- **Combined 5-minute double-echo in steady-state with separated echoes and 2-minute proton-density-weighted 2D FSE sequence for comprehensive whole-joint knee MRI assessment** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
  Chaudhari, A. S., Stevens, K. J., Sveinsson, B., Wood, J. P., Beaulieu, C. F., Oei, E. G., Rosenberg, J. K., Kogan, F., Alley, M. T., Gold, G. E., Hargreaves, B. A.
  2019; 49 (7): E183–E194

- **Kinetic [F-18]-Fluoride of the Knee in Normal Volunteers** *CLINICAL NUCLEAR MEDICINE*
  Haddock, B., Fan, A. P., Jorgensen, N. R., Suetta, C., Gold, G., Kogan, F.
  2019; 44 (5): 377–85

- **Applications of PET-Computed Tomography-Magnetic Resonance in the Management of Benign Musculoskeletal Disorders.** *PET clinics*
  Yoder, J. S., Kogan, F., Gold, G. E.
  2019; 14 (1): 1–15

- **PET-MRI for the Study of Metabolic Bone Disease.** *Current osteoporosis reports*
  Yoder, J. S., Kogan, F., Gold, G. E.
  2018

- **Applications of PET-MRI in musculoskeletal disease.** *Journal of magnetic resonance imaging : JMRI*
  Kogan, F., Broski, S. M., Yoon, D., Gold, G. E.
  2018; 48 (1): 27–47

- **Super-resolution musculoskeletal MRI using deep learning.** *Magnetic resonance in medicine*

Chaudhari, A. S., Fang, Z., Kogan, F., Wood, J., Stevens, K. J., Gibbons, E. K., Lee, J. H., Gold, G. E., Hargreaves, B. A.
2018

- **Volumetric Multislice GagCEST Imaging of Articular Cartilage: Optimization and Comparison With T1rho** *MAGNETIC RESONANCE IN MEDICINE*
  Kogan, F., Hargreaves, B. A., Gold, G. E.
  2017; 77 (3): 1134-1141

- **Perfusion has no effect on the in vivo CEST effect from Cr (CrCEST) in skeletal muscle.** *NMR in biomedicine*
  Kogan, F., Stafford, R. B., Englund, E. K., Gold, G. E., Hariharan, H., Detre, J. A., Reddy, R.
  2017; 30 (1)

- **Potential of PET-MRI for imaging of non-oncologic musculoskeletal disease.** *Quantitative imaging in medicine and surgery*
  Kogan, F., Fan, A. P., Gold, G. E.
  2016; 6 (6): 756-771

- **T-2 Relaxation time quantitation differs between pulse sequences in articular cartilage** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
  Matzat, S. J., McWalter, E. J., Kogan, F., Chen, W., Gold, G. E.
  2015; 42 (1): 105-113

- **Imaging strategies for assessing cartilage composition in osteoarthritis.** *Current rheumatology reports*
  Matzat, S. J., Kogan, F., Fong, G. W., Gold, G. E.
  2014; 16 (11): 462-?

- **In Vivo Chemical Exchange Saturation Transfer Imaging of Creatine (CrCEST) in Skeletal Muscle at 3T** *JOURNAL OF MAGNETIC RESONANCE IMAGING*
  Kogan, F., Haris, M., Debrosse, C., Singh, A., Nanga, R. P., Cai, K., Hariharan, H., Reddy, R.
  2014; 40 (3): 596-602

- **In vivo Magnetic Resonance Imaging of Tumor Protease Activity** *SCIENTIFIC REPORTS*
  Haris, M., Singh, A., Mohammed, I., Ittyerah, R., Nath, K., Nanga, R. P., Debrosse, C., Kogan, F., Cai, K., Poptani, H., Reddy, D., Hariharan, H., Reddy, et al
  2014; 4

- **High Resolution T1 rho Mapping of In Vivo Human Knee Cartilage at 7T** *PLOS ONE*
  Singh, A., Haris, M., Cai, K., Kogan, F., Hariharan, H., Reddy, R.
  2014; 9 (5)

- **Imaging of glutamate in the spinal cord using GluCEST** *NEUROIMAGE*
  Kogan, F., Singh, A., Debrosse, C., Haris, M., Cai, K., Nanga, R. P., Elliott, M., Hariharan, H., Reddy, R.
  2013; 77: 262-267

- **Chemical Exchange Saturation Transfer (CEST) Imaging: Description of Technique and Potential Clinical Applications.** *Current radiology reports*
  Kogan, F., Hariharan, H., Reddy, R.
  2013; 1 (2): 102-114

- **MICEST: A potential tool for non-invasive detection of molecular changes in Alzheimer's disease** *JOURNAL OF NEUROSCIENCE METHODS*
  Haris, M., Singh, A., Cai, K., Nath, K., Crescenzi, R., Kogan, F., Hariharan, H., Reddy, R.
  2013; 212 (1): 87-93

- **Exchange rates of creatine kinase metabolites: feasibility of imaging creatine by chemical exchange saturation transfer MRI** *NMR IN BIOMEDICINE*
  Haris, M., Nanga, R. P., Singh, A., Cai, K., Kogan, F., Hariharan, H., Reddy, R.
  2012; 25 (11): 1305-1309

- **Imaging of glutamate neurotransmitter alterations in Alzheimer's disease.** *NMR in biomedicine*
  Haris, M., Nath, K., Cai, K., Singh, A., Crescenzi, R., Kogan, F., Verma, G., Reddy, S., Hariharan, H., Melhem, E. R., Reddy, R.
  2012

- **Chemical exchange saturation transfer magnetic resonance imaging of human knee cartilage at 3 T and 7 T** *MAGNETIC RESONANCE IN MEDICINE*
  Singh, A., Haris, M., Cai, K., Kassey, V. B., Kogan, F., Reddy, D., Hariharan, H., Reddy, R.
  2012; 68 (2): 588-594

- **Investigation of chemical exchange at intermediate exchange rates using a combination of chemical exchange saturation transfer (CEST) and spin-locking methods (CESTrho)** *MAGNETIC RESONANCE IN MEDICINE*
  Kogan, F., Singh, A., Cai, K., Haris, M., Hariharan, H., Reddy, R.
  2012; 68 (1): 107-119