Methodology & Resource Advisors (and Potential Co-Mentors):

The primary mentors cited above also can serve as methodology and resource advisors, and co-mentors. The Methodology & Resource co-mentors, listed below, broaden support and consultative resources for trainees in individual projects. The primary faculty mentor for each trainee remains responsible for selecting, networking, and scheduling research project meetings with resource advisors and co-mentors.

i. David Boyle. UCSD. Biomarkers. Professor Boyle focuses on biomarkers in rheumatic diseases, and runs the ACTRI Biomarkers Core and Rheumatic Diseases Biorepository. David Boyle is a unique investigator who rose to UCSD Professorship despite not having an advanced degree. He collaborates with virtually all the UCSD Rheumatology faculty in this central capacity, and is a global, highly collaborative expert on rheumatic diseases biomarker and repository infrastructure and technical issues.

ii. Christine Chung, MD. UCSD. Skeletal Imaging. Complemented by the imaging expertise of Drs. Ward and Ceponis Dr. Chung brings expertise in standard and functional MR imaging of peripheral joints and spine.

iii. Kelly Frazer, PhD. UCSD. Computational genetics. Chief of the Division of Genome Information Sciences and Director of the UCSD Institute of Genomic Medicine, Dr. Frazer analyzes genetic predisposition to complex diseases starting in childhood but spanning the whole age spectrum. Major efforts in her lab are dedicated to GWAS, and to large-scale collection of iPSCs to generate iPSC-derived cells, and analyzing how inherited coding and regulatory variants influence manifestations of disease and adverse drug reactions. She and her group provide consultation on experimental design and data analysis for genomics studies, with a focus on Next Generation sequencing. She will continue to serve as Genomics resource faculty and provide guidance to trainees with needs in this area (eg, ultra deep sequencing projects).

iv. Trey Ideker, PhD. UCSD. Systems and network biology. Winner of the ISCB Overton prize, and several other major awards for technical innovation in science, Dr. Ideker is markedly influential in systems and network biology (ISI 36,593 citations, H-index 73). His major interests include mapping the genetic network underlying the response to DNA damage, network-based biomarkers for disease diagnosis and precision medicine (including advances in monitoring NF-κB activation in disease, and protein network comparative genomics, such as his development of the Cytoscape open-Source platform, a software environment for visualization and analysis of biological networks and models). Dr. Ideker will continue to serve as Systems Biology resource faculty and provide assistance with developing relevant algorithms and strategies.

v. Karen Messer, PhD. UCSD. Biostatistics and tools for biomarker studies. Division Chief of Biostatistics and Bioinformatics, Dr. Messer has directed the Biostatistics Shared Resource since 2006. An applied and mathematical biostatistician, she collaborates widely, including co-investigator on funded grants for "integrative omics" of Drs. Terkeltaub and Firestein. She has developed new statistical tools and methods in genomic and biomarker studies, has designed many clinical trials, and leads large collaborative research projects and statistical cores. One of

her interests is in integrated genomic and behavioral risk models for disease.

vi. Robin Knight, PhD. UCSD. Microbiome research including epidemiology, composition, dynamics, metagenomics. Dr. Knight, recently recruited to UCSD, directs the UCSD Microbiome Core Center. He is a global microbiome research leader. His accomplishments include the first overall microbiome maps across human body sites, software for interpreting large human microbiome DNA sequence datasets, understanding microbiome evolution in human lifespan, and placing this in context of other microbial communities in the overall environment. He developed methods for high-throughput and highly multiplexed amplicon sequencing on the 454 and Illumina platforms that are now standard in the field, and software for microbial community analysis including QIIME (now cited over 5000 times) and UniFrac (over 2000 times). He actively collaborates with RAI Division faculty, including Dr. Kalunian on the microbiome in SLE.

vii. Ru Liu-Bryan, PhD. UCSD. Cartilage biology, metabolism and inflammation, OA models. Professor Liu-Bryan collaborates with several T32 faculty, particularly in OA animal modeling and chondrocyte biology. Her expertise also includes intersections of metabolism with inflammation, and assessment by metabolomics.

viii. Lucila Ohno-Machado, MD., PhD. UCSD. Informatics, Health Care Disparities. Chair of UCSD Department of Biomedical Informatics, and Director of the ACTRI Informatics Core, and founder and PI of the UCSD T32 Informatics Training Program, Dr. Ohno-Machado brings valued expertise on privacy-protecting data sharing, and construction and evaluation of data mining and decision support tools for research and clinical care. She develops tools to analyze "big data" efficiently through distributed computation. She directs the patient-centered SCAlable National Network for Effectiveness Research project, funded by PCORI, which queries EHRs of over 24 million unique USA patients, and includes the national VA enterprise data warehouse. She is involved in the UC-Research exchange, the Data Discovery Index for the BD2K initiative, and NIH-funded National Center for Biomedical Computing on integrating Data for anonymization, Analysis, and SHaring (iDASH). The iDASH pilot projects involve data sharing for URMs, and CA Precision Medicine Consortium.

ix. Joe Ix, MD., MAS. (ISI 5,487 citations, H-index 40). Dr. Ix serves as methodology and resource co-mentor in this T32. He is Chief of the Division of Nephrology at UCSD, and PI of a T32 focusing on clinical investigation within renal and vascular diseases, and also is PI of a midcareer K24 award from the NIDDK for mentoring of junior investigators. He studies renal diseases including SLE nephritis, and is PI of a phase II (200 person) RCT evaluating the effect of nicotinamide on phosphate and FGF23 homeostasis, pertinent to metabolic bone diseases in advanced CKD. He investigates arterial diseases in the MESA cohort, and is developing work for our T32 cycle, in which a trainee would test the hypothesis that arterial calcification is mediated both by anti-citrullinated protein antibodies and TNF in RA.