Atrium Health Wake Forest Baptist Comprehensive Cancer Center

**Combined Cancer Programs**
The combined cancer programs at the National Cancer Institute (NCI)-designated Atrium Health Wake Forest Baptist Comprehensive Cancer Center (AHWFBCCC, headquartered in Winston-Salem, North Carolina) and Levine Cancer Institute (headquartered in Charlotte, North Carolina) and are led by Executive Director Ruben Mesa, MD, FACP. Dr. Mesa is also President of the Enterprise Cancer Service Line and Vice Dean of Cancer Programs at WFUSM. Combined, the Levine Cancer Institute and AHWFBCCC have a shared catchment area that includes 30 counties across the Southeast region, where approximately over 18,000 new cancer patients are seen per year. With 30+ care locations and our decentralized model of care, our cancer program ensures that patients can receive world-class cancer care close to home. Twenty clinical sites accrue patients to research studies, with 20% of patients enrolled on studies living in rural areas. Our patient population is diverse, with 18% of patients identifying as African American and 3% of patients identifying as Hispanic. Our combined cancer programs have over 1,000 patients enrolled in interventional trials and over 500 clinical trials enrolling patients, utilizing a single Institutional Review Board (Wake Forest University Health Sciences Internal Review Board (IRB); FWA00001435).

Additionally, the combined cancer programs have already started several collaborations together, including a project involving Levine Cancer Institute and AHWFBCCC on supportive oncology and survivorship, which has already resulted in NCI funding (1R01CA266995; PI: Stephanie Sohl, M.D.) and a clinical trial open at both sites (NCT05625360). Joint seminar series between Levine Cancer Institute and AHWFBCCC have been held to foster collaboration among the faculty affiliated with each cancer program, including the Cancer Grand Rounds seminar series, where distinguished national and international scientists are invited to speak on topics related to cancer research.

**AHWFCC**
The AHWFBCCC was founded in 1972 and was one of the first to receive NCI designation in 1974. Since its inception, the Cancer Center has been continuously funded through the NCI Cancer Center Support Grant (CCSG). The core mission of AHWFBCCC is to reduce cancer incidence, morbidity, and mortality in the rural southeast Appalachia, as well as nationally and internationally, through cutting-edge research and treatment, community education and outreach, and transdisciplinary training of next-generation biomedical scientists and health care providers. The AHWFBCCC serves a catchment area of 30 counties located in rural and Appalachian regions within central and western North Carolina (NC), southwestern Virginia (VA), and West Virginia (WV). The region is characterized by high rates of poverty, uninsured residents, and limited access to primary care, cancer screening facilities, and cancer treatment. The area is also the historic capital of the tobacco industry and the consequent excess mortality for smoking-related cancers is a significant issue, especially among rural populations.

The Center is strategically organized to address these issues, promote team science that translates discovery into improved prevention strategies and cancer care, and train the next generation of cancer researchers and care providers through the collective efforts of its 140 members representing 29 academic departments. The Cancer Research Training and Education Coordination (CRTEC) of the Center aims to increase diversity and inclusion of the next-generation pool of cancer researchers and professionals and to develop and integrate cancer-focused training, education, and professional development activities across all levels of learners. This is realized through sustaining and growing the depth and breadth of the cancer research enterprise by recruiting promising early-career faculty members, student/postdoctoral trainees, and other medical professionals, and by providing them with strong mentoring and training support. Promoting diversity and inclusion is one of the key priorities of CRTEC.

The AHWFBCCC excels in transdisciplinary research across the basic, translational, clinical, and population science spectrum. Programmatic science exhibits substantial depth and breadth, with initiatives targeted to directly serve the catchment area. Members are national experts in tobacco, delivery systems for clinical cancer care, symptom control, cancer signaling, precision oncology, and novel cancer therapies. They have developed models that guide interventions locally and nationally. Education and training efforts boast a wide-ranging impact, including oncology provider, patient, caregiver, student, and community education across the Piedmont and southern Appalachian region.
Driving the Cancer Center’s scientific accomplishments are its four research Programs: Cancer Prevention and Control (CPC), Cancer Genetics and Metabolism (CGM), Signaling and Biotechnology (SBT), and Neuro-Oncology (NRO). The five key strategic priorities meeting the needs of the Center catchment area are Precision Medicine, Tobacco, Health Disparities, Treatment Resistance and Recurrence, and Survivorship. Nine well-managed Shared Resources (SRs) with state-of-the-art instrumentation, technologies, and high-quality technical services support the Center’s research activities: Bioinformatics (BISR), Biostatistics (BSSR), Cancer Genomics (CGSR), Cell Engineering (CESR), Crystallography and Computational Biosciences (CCBSR), Flow Cytometry (FCSR), Proteomics and Metabolomics (PMSR), Qualitative and Patient-Reported Outcomes (Q-PRO), and Tumor Tissue and Pathology (TTPSR), described below.

The AHWFBCCC is one of three such centers in the state, one of 53 in the country, and one of the few to hold the designation continuously since 1974. The Center holds the only Pancreatic Cancer Center designation by the National Pancreas Foundation in North Carolina and one of just 28 in the country, in recognition of its multidisciplinary, patient-centered treatment of the disease. A $125M expansion of the AHWFBCCC location in Winston-Salem, NC was completed in 2013, consolidating inpatient and outpatient services. The new center offers 530,600 sq. ft. of space, making it the largest integrated cancer hospital in North Carolina. The Center is a 167-bed facility with 120 clinicians representing all aspects of cancer care who are committed to offering inpatients and outpatients the latest treatments, technologies, and clinical trials, including precision medicine and cancer genomics.

The Center organizes its clinical research activities into 13 Disease-Oriented Teams (DOTs): Brain, Breast, Cancer Control and Survivorship, Gastrointestinal, Genitourinary, Gynecologic Oncology, Head and Neck, Hematologic Malignancies, Lung, Melanoma, Pediatric Oncology, Phase 1 and Precision Medicine, and Sarcoma. DOTs include members of the Center’s basic science programs and the Cancer Prevention and Control Program, in addition to clinical research program members to promote inter-programmatic collaborations and translational science. The DOTs are also closely integrated with clinical operations to align the Center’s clinical and research missions. The four Centers of Excellence at the AHWFBCCC (described below) are conduits to expand DOT research activities in multiple translational studies and into industry-sponsored and NIH-supported clinical trials.

**Data Resources of AHWFBCCC**

*Clinical Protocol and Data Management (CPDM)*

The Clinical Protocol and Data Management (CPDM; Bayard Powell, MD, Medical Director) at AHWFBCCC facilitates translational science by providing services that enable and promote the conduct of high-quality clinical research. These services include managing processes and providing expertise that enable high-quality protocol development and efficient trial activation, along with supporting the infrastructural elements of clinical research – finance, regulatory, data, and clinical research coordinator and nursing management – to promote AHWFBCCC science and its translation into the community and to promulgate NCI and Cancer Center Support Grant objectives for clinical research. CPDM also maintains a centralized protocol document directory, a centralized database of protocol-specific data, and data and safety monitoring activities that promote high quality performance and study completion while ensuring participant safety. A Data and Safety Monitoring Plan is required for all interventional studies. The AHWFBCCC supports multiple proactive efforts to promote the recruitment of women and underrepresented minorities in research. These efforts have included working with the Office of Cancer Health Equity to assess catchment area needs and launch initiatives to support underserved patients through education and navigation. For AHWFBCCC investigator-initiated studies, risk-based monitoring is conducted by the Data Safety Monitoring Committee (DSMC) to ensure the highest levels of patient safety. Effective quality control functions are also instituted to ensure the highest level of protocol compliance according to the 2021 AHWFBCCC NCI-approved Data and Safety Monitoring Plan.

*AHWFCCC Shared Resources*

**Biostatistics SR (BSSR)**

The primary goal of the Biostatistics Shared Resource (BSSR) is to facilitate peer-reviewed research. BSSR is directed by Ralph D’Agostino, Jr., PhD. Professor of Biostatistics and Data Science. BSSR collaborates with investigators to 1) support AHWFBCCC investigator-initiated clinical protocols, including statistical designs, preparation of statistical sections, and review of statistical content; 2) monitor and analyze clinical protocols,
including patient accruals, support for quality assurance efforts, and performance of interim and final analyses; 3) design statistical plans and data analysis methods for basic, clinical, and population science grant proposals and publications; and 4) offer education and training opportunities from graduate-level courses to participation in NIH-funded T32 training programs as well as serving as mentors to early-career investigators.

Bioinformatics SR (BISR)
BISR is directed by Wei Zhang, PhD, Professor of Cancer Biology. The primary goal of the Bioinformatics Shared Resource (BISR) is to provide bioinformatics, data, and computational support for all state-of-the-art omics and clinical research efforts at AHWFBCCC. The BISR faculty and staff collaborate closely with researchers in all programs engaged in basic, translational, and clinical research. BISR provides investigators support for 1) experimental design, computational analyses, and data visualization and interpretation in the context of grant development and ongoing research studies; and 2) clinical research, notably by supporting the development of clinical trials and the Cancer Center Strategic Plan’s priority in the Precision Oncology Initiative. BISR participates in national consortia, which facilitates access to national omics and clinical data networks. Over the past few years, BISR has expanded the genomic data analyses from traditional platforms (e.g., microarray, RNA-seq, whole-exome/genome sequencing, ChiP-Seq) to the newest state-of-the-art genomics technologies, including 10X single-cell RNA-seq and ATAC-seq, SPLiT-seq, and single-cell mass cytometry (CyTOF). Working closely with other AHWFBCCC shared resources, especially CGSR and PMSR, BISR integrates analyses for genomics/proteomics/metabolomics for multi-omics projects. BISR utilizes public databases such as TCGA, AACR GENIE, CCLE, as well as AHWFBCCC data from the Precision Oncology Initiative. We use a combination data solution to utilize the CTSI (Clinical and Translational Science Institute)-maintained Translational Data Warehouse, AHWFBCCC Cancer Registry, and Cloud Storage/Computing resource.

Cancer Genomics SR (CGSR)
The Cancer Genomics Shared Resource (CGSR) aims to maximize the scientific impact of basic, translational, and clinical cancer research at AHWFBCCC, fostering the discovery and characterization of cancer-related genomic, transcriptomic and epigenetic alterations. CGSR is co-directed by Lance D. Miller, PhD, Associate Professor of Cancer Biology, and Gregory A. Hawkins, PhD, Professor of Biochemistry. CGSR services include: 1) RNA and DNA isolation from small biological samples; 2) custom library production; and 3) next-generation sequencing for basic and translational cancer research, notably (single-cell) RNA-seq, microRNA-seq, whole exome/whole genome DNA-seq, single nucleotide polymorphism (SNP) genotyping, copy-number analysis, methylation profiling, ATAC-seq, analysis of microbial diversity (meta-genomics), and ultra-low input/single-cell sequencing applications. Computational tools used by CGSR include industry and academic standards for sequence processing, alignment and variant calling, and differential expression analyses. CGSR works in close collaboration with BISR. While the CGSR prioritizes cancer-specific research to create an optimal environment for the Institution’s rapidly developing Precision Oncology Initiative (POI), CGSR also partners with other key shared resources to promote integrated cross-SR service workflows for advanced genomic applications such as single-cell and spatial single-cell expression profiling.

Cell Engineering SR (CESR)
The Cell Engineering Shared Resource (CESR) offers expertise in cell line engineering using viral and non-viral approaches and to provide the resources to analyze cancer cell growth/death in vitro and in vivo under a wide variety of experimental conditions. CESR is directed by Ravi Singh, PhD, Associate Professor of Cancer Biology. Originally designed as a repository for cancer cell lines and frequently used viral vectors, this SR has substantially expanded its services to align itself with technological advances and investigator needs. CESR provides services such as: 1) viral vector production, gene editing (CRISPR/Cas9), cell line engineering, and primary cell line development from patient samples; 2) access and training for instrumentation to characterize and study engineered cell models (hypoxia chamber, in vivo imaging systems, live-cell microscopy system); 3) maintaining an extensive repository of characterized cancer and non-cancer cell lines and producing custom media formulations for each line; 4) acting as a central distribution service for cell culture consumables, media formulations, and kits/reagents (AHWFBCCC investigators benefit from low, negotiated prices); and 5) recently launched high-throughput screening services for drug discovery projects by collaborating with other NCI-Designated Cancer Centers in North Carolina.
Crystallography and Computational Biosciences SR (CCBSR)
The Crystallography and Computational Biosciences Shared Resource (CCBSR) is a highly specialized shared resource that provides investigators with access to expertise, consultation, and state-of-the-art equipment for structural biology experiments and computational bioscience approaches. This shared resource functions as a collaborative model; i.e., the co-directors shepherd the development of projects through the collection of essential preliminary data for NIH and other funding applications. As a project matures and extramural funding has been secured, graduate students, postdoctoral fellows and additional technicians are added to the project. As such, the co-directors contribute to all publications and participate as Principal Investigator or Co-Investigator on most grant applications, unlike other shared resources in the AHWFBCCC portfolio. CCBSR is co-directed by Thomas Hollis, PhD, Professor of Biochemistry, Todd Lowther, PhD, Professor of Biochemistry, and Freddie R. Salsbury Jr., PhD, Professor of Physics. CCBSR is a specialized SR providing 1) expertise, consultation, and state-of-the-art instrumentation for X-ray crystallography and structure modeling and refinement; and 2) computational resources and expertise to handle the development of structural and force field models, deployment of quantum mechanical calculations, virtual screening of compound libraries, and molecular dynamics studies. Among other computational resources, CCBSR has access to supercomputing capabilities of the WF Distributed Environment for Academic Computing (DEAC) cluster. A key feature of CCBSR is expertise in virtual screening for small molecules, which complements recent high-throughput screening partnerships between SRs at AHWFBCCC and other academic centers in North Carolina.

Flow Cytometry SR (FCSR)
The Flow Cytometry Shared Resource (FCSR) is directed by Jason Grayson, PhD, Associate Professor of Microbiology and Immunology. The goal of FCSR is to provide investigators with ready access to the necessary expertise and state-of-the-art flow cytometry instrumentation that can be applied to a wide range of cancer biology research. Flow cytometry is a critical technology that provides rapid single-cell analysis and cell sorting through the simultaneous detection of light scatter properties and the presence of multiple cellular molecules or metabolites in or on an individual cell. In addition, the FCSR seeks to foster the development of protocols that can utilize the continually increasing number of available markers and methodologies. FCSR provides investigators with 1) access to cutting-edge instrumentation for flow cytometric analysis (with 4 analyzers with 24/7 access); 2) multi-parameter cell sorting for user-defined populations (with 2 sorters); and 3) expertise to design and interpret high-dimensional flow cytometry data. FCSR critically enables studies at the single-cell level, and recent institutional investments in a new cell sorter/analyzer have broadened the range of cytometry applications, particularly in immuno-oncology.

Proteomics and Metabolomics SR (PMSR)
The Proteomics and Metabolomics Shared Resource (PMSR) provides advanced mass spectrometry services, technological data analysis, and scientific consultation for global and targeted proteomics, metabolomics, and lipidomics to support Precision Oncology—one of the Cancer Center’s top strategic priorities. More broadly, PMSR specializes in discovery, identification, characterization, and quantification of biomolecules, drugs, and biologically-active natural compounds by mass spectrometry and biochemical methods, and chromatography of proteins, peptides, lipids, and nucleic acids. PMSR is directed by Cristina M. Furdui, PhD, Professor of Internal Medicine.

Qualitative and Patient Reported Outcomes SR (Q-PRO)
The AHWFBCCC Qualitative and Patient-Reported Outcomes (Q-PRO) Shared Resource provides investigators with state-of-the-art methods for conducting qualitative research and provides expert guidance on patient-reported outcomes (PRO) measurement. Q-PRO was developed in 2016 and is co-directed by Erin Sutfin, PhD, and Lynne Wagner, PhD, both Professors of Social Sciences and Health Policy. Q-PRO collaborates with investigators and supports population health research and clinical research activities by providing pre- and post-award research consultation, expertise, and research operations support in two areas: 1) qualitative research methodological expertise and infrastructure, including study design, data collection, management of textual data, and data analysis; and 2) patient-reported outcomes measurement consultation, including defining aims and selecting domains to inform questionnaire selection, assessment design, method of data collection, and defining endpoints, including scoring and analysis. Consultation on power calculations, sample size estimates, and analysis for patient-reported outcomes is provided in collaboration with BSSR. Major Services of Q-PRO include pre- and post-award consultation on all phases of qualitative inquiry,
including the design and selection of data collection methods, participant recruitment and sampling, and data analysis. Proposal development, writing, and preparation of a budget and budget justification for the proposed work are offered. **Qualitative research services** include access to a research team with specialized, state-of-the-art training who can conduct qualitative data collection and perform high-quality analysis. **PRO measurement consultation** includes methodological expertise in the design of quantitative PRO measurement. This includes consultation on measure selection, assessment frequency, mode of administration, and scoring and analysis. Consultation on power calculations and sample size estimates for PROs and on the analysis of results are provided in collaboration with the Biostatistics Shared Resource (SR). Technology-based strategies for PRO administration, including integration with the electronic health record (EHR), occur in collaboration with the Bioinformatics SR. **Education and Training:** Q-PRO provides tailored one-on-one and group training to investigators who aim to increase their own qualitative research skills. In coordination with Cancer Research Training and Education Coordination (CRTEC), Q-PRO conducts seminars throughout the Institution (e.g. Education Grand Rounds, Clinical and Translational Science Institute seminar series).

**Tumor Tissue and Pathology SR (TTPSR)**
TTPSR is directed by **Edward Levine, MD**, Professor of Surgery. The Tumor Tissue and Pathology Shared Resource (TTPSR) has been a part of the AHWFBCCC since 1994. TTPSR facilitates translational cancer research and provides pathology services to investigators. TTPSR consists of four well-integrated component laboratories: the Tumor Procurement Lab (TPL), the Human Pathology Lab (HPL), the Comparative Pathology Lab (CPL), and the Organoid Processing Lab (OPL). TPL focuses on tissue procurement and banking, whereas the HPL and TPL focus on quality control of samples and provide clinical pathology expertise to investigators. CPL provides unique samples and pathology expertise in experimental animal models ranging from rodents to non-human primates. OPL is a newly-added component to TTPSR, which focuses on the formation of 3D patient-specific tumor organoids and applying them translationally, with the goal of informing personalized cancer treatments as well as research and development of new therapies. TTPSR services include: 1) collection, banking, and supply of high-quality, well-characterized human and animal tissues (neoplastic and normal); 2) scientific and pathologic expertise related to tissue collection, processing, and histological analyses; 3) pathology services for cancer investigations (human and animal tissue); and 4) development of 3D patient-specific tumor organoids for research and personalized medicine.

**Office of Cancer Health Equity (OCHE) - Community Outreach and Engagement**
The AHWFBCCC serves a 30-county region in western North Carolina, southwestern Virginia, and southern West Virginia. This catchment area is largely rural and has significant racial, ethnic, and geographic cancer disparities, driven largely by elevated cancer risk factors (obesity, tobacco use) and limited access to health care and other social determinants of health in the region. The overall goal of community outreach and engagement at AHWFBCCC is to inform research, develop education programs, and implement cancer control strategies to address the cancer burden within the AHWFBCCC catchment area, with a particular focus on cancers that disproportionately impact the region. The community outreach and engagement seeks to achieve the following: 1) define, describe, and disseminate information on the cancer burden, risk factors, and disparities in the catchment area to guide AHWFBCCC research and community-informed interventions; 2) implement evidence-based cancer control interventions, facilitated through community collaborations and designed to impact the burden of cancer in the catchment area; 3) facilitate and support community-engaged research and diverse and inclusive clinical trial participation within the cancer center’s region and beyond; and 4) promote policy and advocacy directed at reducing the cancer burden and disparities and advancing cancer health equity. Community outreach and engagement activities are facilitated through the **Office of Cancer Health Equity (OCHE)**, led by **Kathryn Weaver, PhD, MPH**, (Interim Associate Director, Research Integration), and **Carla Strom, MLA** (Assistant Director, Operations). The community outreach and engagement staff reflects the diversity of the catchment area and includes Population Health Navigators, Community Educators, and Research Facilitators. Dr. Weaver receives guidance and input from the Community Advisory Board, which ensures integration of community engagement into the clinical, research, and educational activities of the AHWFBCCC. The community outreach and engagement has been very successful in increasing participation of underserved populations in cancer clinical trials.

**Brain Tumor Center of Excellence**
The Brain Tumor Center of Excellence was established in 2003 to develop a comprehensive academic brain
tumor program at WF. Researchers focus on finding solutions that benefit patients with brain tumors by:
devolving novel approaches to therapy; protecting delicate healthy brain tissue against possible harmful
effects of treatment; obtaining images of the disease and the effects of the treatment on the disease using safe
and sensitive methods of detection; using the best possible models for pre-clinical examination of therapies or
preventative measures (in collaboration with the Virginia Tech School of Veterinary Medicine); and enhancing
the quality of life for patients. In addition to studies conducted at WF, the Brain Tumor Center of Excellence
also participates in clinical trials sponsored by the Children’s Oncology Group, American College of Surgical
Oncology Group, Radiation Therapy Oncology Group, and the pharmaceutical industry. In 1999, WF expanded
its treatment options even further when it became the first hospital in the state of North Carolina to offer
Gamma Knife stereotactic radiosurgery. The WF Gamma Knife Center is one of the busiest in the country,
seeing and treating patients throughout the Southeast region.

*Breast Cancer Center of Excellence*
Established in 1999, the Breast Cancer Center of Excellence aims to develop novel and innovative approaches
to fight breast cancer by facilitating cross-disciplinary collaborations aimed at moving scientific concepts from
the laboratory to the clinic, with an emphasis on team science strategies that enable the funding and expansion
of research activities. The Breast Cancer Center of Excellence concentrates its research efforts on four specific
themes: biology of breast carcinogenesis and malignant progression; analysis of large data sets for
identification of breast cancer predictive markers; quality of life and survivorship issues; and novel imaging and
therapeutics.

*Prostate Cancer Center of Excellence*
The Prostate Cancer Center of Excellence, established in 1999, draws upon AHWFCCC members from all
scientific programs and includes clinicians, basic scientists, and public health scientists. Research activities in
the Prostate Cancer Center of Excellence fall into two broad areas: chemoprevention and novel therapies.
Chemoprevention includes both the prevention of cancer and of recurrence.

*Tobacco Control Center of Excellence*
The WFUHS-funded Tobacco Control Center of Excellence (TCCOE) is a research center with the primary
objective to expand knowledge and reduce the burden of tobacco-related disease through research, education,
training, treatment and implementation. The TCCOE was established in 2017 with support from WFBCCC. The
TCCOE is directed by Eric Donny, PhD and the Associate Director is Erin Sutfin, PhD. The Tobacco Control
Center of Excellence aims to: encourage a wide range of research aimed at better understanding the use of
tobacco products and their impact on health; facilitate the translation of research into effective prevention,
treatment, and policy interventions; and support the development of promising students and faculty. The
TCCOE is interested in promoting activities across a wide range of areas including basic science,
transdisciplinary/translational research, prevention, cessation, addiction and decision sciences, reducing
tobacco-related disease, health disparities, potential reduced harm tobacco products, policy and regulatory
science. Current and planned center activities include pilot funding, travel awards, seminar/webinar series,
“incubation” hour, and faculty recruiting.

*Wake Forest NCI Community Oncology Research Program (NCORP) Research Base*
The WF NCORP Research Base (2UG1CA189824-06; MPI: Glenn Lesser, MD and Kathryn Weaver, PhD)
serves as one of only seven NCORP Research Bases in the United States. NCORP Research Bases are the
entities that conduct the majority of cancer control, symptom management, and cancer care delivery research
studies approved by the NCI’s Division of Cancer Prevention (DCP). The WF NCORP Research Base is now
in grant year 23 (15 years of funding were under the NCI Community Clinical Oncology Program: CCOP) and
was successful in its most recent competing renewal.

NCORP designs and conducts cancer prevention, control, screening, and post-treatment surveillance trials.
NCORP also conducts cancer care delivery research, including comparative effectiveness research, and
integrates disparities research questions into clinical trials and cancer care delivery research. This program
provides a conduit for community physicians to participate in NCI-supported trials, giving their patients
enhanced access to high-quality research studies in their own communities.
iDAPT is one of seven National Cancer Institute-funded Implementation Science Centers for Cancer Control to conduct research in high-priority areas and to advance the methods and measurement within implementation science. iDAPT uses technologies to support rapid-cycle and real-time deployment and testing of implementation processes and adaptations within cancer control. The iDAPT team focuses on building capacity among primary care and oncology partners to engage in implementation science in cancer control and to conduct pilot studies aligned with iDAPT’s theme. iDAPT has an extensive network of partners concentrated in the urban northeast and southern Appalachia, as well community-based primary care and oncology clinics throughout the United States. iDAPT is committed to the inclusion of early-career faculty and under-represented persons in all aspects of the center.