

College of Medicine Strategic Plan

2020-2025

- Developed and Revised by College of Medicine Faculty and Administrators 2019-2020
- Final Review by the College of Medicine Faculty October 2020
- Approved by the College of Medicine Executive Dean November 15, 2020
- The Strategic Planning Monitoring Committee meet on 6/17/2021 and recommended changes. Feedback on these recommendations were sought from DFAC and the Council of COM, and the Executive Dean accepted the recommended changes on July 1, 2021. The current version of the plan incorporates the recommended changes.
- The Sr Associate Dean of Research, in concert with the DFAC, Council of COM, and faculty at-large, completed a major revision to the research plan that was approved by the Executive Dean in Dec of 2021. The plan replaces the nascent research plan approved in Nov of 2020 and appears in the current version shown here.

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Mission Statement of the University of Tennessee Health Science Center and College of Medicine:

The mission of the University of Tennessee Health Science Center is to improve the health and well-being of Tennesseans and the global community by fostering integrated collaborative and inclusive education, research, scientific discovery, clinical care and public service.

Education

Educate outstanding graduates who meet the needs of the state and its communities			
Goal	Initiatives	Actions	Outcomes
1. Expand and strengthen team-based Interprofessional educational experiences	<p>1A Expand UME-GME partnership Point of Care Ultrasound (POCUS) program to include students from other programs/colleges (PA, COHP – PT/OT)</p> <p>1B Expand UME Poverty simulation by CHIPS to include students from other programs/colleges (PA, COD, COP, CON CHP)</p> <p>1C Expand UME-COP medical/prescription drug adherence (escape room) simulation to include students from other programs/colleges (PA, COD, COP, CON, CHP)</p> <p>1D Expand UME-PT student encounter on chronic low back pain to include students from other programs/colleges (PA, COP, CON)</p> <p>1E Develop and implement end of life/hospice simulation to include students from multiple programs/colleges</p> <p>1F Develop and implement nutritional/culinary health program to include students from multiple programs/colleges</p> <p>1G Have students and residents participate (along with students and residents from the other colleges) in the community Outreach Health Fair that is being organized by Dr. Snyder (Director, UTHSC Health Disparities Education and Community Engagement)</p> <p>1H Involve students from multiple programs/colleges if feasible) in MUH-UTHSC Patient Safety Collaborative and patient safety event analysis, see 6P</p>	<p>1A Recruit ultrasonographer and GME POCUS lead to help expand and coordinate training and offerings (POCUS US Leadership Academy course. Expansion of POCUS in Internal Med and Med-Peds programs), GME funding of cloud-based system for storage of images. 2019-2021</p> <p>1B-F Convene multi college curriculum committee and CHIPS director to explore expansion of IPE curricula, 2020-2021</p> <p>1G Health Fair development completed in 2019</p> <p>1H</p>	<p>1A Ultrasonographer recruit delayed, GME POCUS lead identified (Dr. Rogers), ROH Foundation Grant approved for 6 handheld Butterfly IQ ultrasound machines for resident use. US Leadership Academy POCUS course delayed. Continued development of POCUS initiatives in IM and Med-Peds programs during 2019-2020</p> <p>1B-F</p> <p>1G Health Fair conducted 3 times in 2019-2020; recurring events postponed by the impact of Covid</p> <p>1H</p>

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Goal	Initiatives	Actions	Outcomes
2. Cultivate and sustain effective educational models and technologies to enhance student learning and engagement	<p>2A After each course is completed review and provide feedback to course directors and all instructors asking for action plans where improvement is needed</p> <p>2B Improve integration and appropriate content in the preclinical curriculum to prepare students for both clinical wards and USMLE Board Exams: increase “Step 1-relevant” material; increase the number of generalist faculty that teach across the 1st two years; reduce the number of faculty that give ≤ 2 lectures; reduce unplanned redundancy and minutia with the goal of reducing content in each course by ~10%</p> <p>2C Have preclinical education faculty review Step 1-like exams every 3 yrs</p> <p>2D Annually review and provide feedback to each clerkship asking for action plans where improvement is needed</p> <p>2E Improve clerkship coordination across the state</p> <p>2F Increase the number of Psychiatry clerkship rotation spots</p> <p>2G Continue to expand point of care ultrasound (POCUS); see 1A</p> <p>2H Provide GME faculty and resident teaching development training and peer-evaluation to improve quality; compensate faculty/residents and peer-reviewers for time and effort</p> <p>2I Expand integration of simulations into clinical curriculum</p> <p>2J Explore development of a 3-year UME MD program</p>	<p>2A Generate new or revised templates for feedback</p> <p>2B CMDCS reviews course evaluations to assess content revision needs and number of lectures/faculty</p> <p>2C</p> <p>2D CSS reviews clerkship evaluations annually to identify areas for improvement, 2019</p> <p>2E Have Memphis clerkship directors regularly visit and assess their counterparts at Chattanooga, Knoxville and Nashville to ensure comparability, 2020-2021</p> <p>2F Increased spots statewide 2019-2020</p> <p>2G See 1A</p> <p>2H See 6O</p> <p>2I See 1B-F</p> <p>2J New committee to assess and evaluate, 2019-2020</p>	<p>2A Implemented in 2020, in routine use</p> <p>2B Peripheral/Central Nervous System, Endocrine, Musculoskeletal Organ Systems block content reduced; fewer faculty with ≤ 2 lectures/faculty. Implemented in 2019-2020 and ongoing</p> <p>2C</p> <p>2D. Plan implemented at the level of CD and Assoc Dean OME, 2019-2020, To be reviewed annually at CSS in 2021</p> <p>2E More frequent state-wide meetings via Zoom, 2020. Face-face visits to begin 2021 or after Covid</p> <p>2F Spots increased at UTC and UTK, 2019-2020; plans to further increase ongoing</p> <p>2G See 1A</p> <p>2H See 6O</p> <p>2I See 1B-F</p> <p>2J Proposal submitted to LCME in 2020</p>

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Goal	Initiatives	Actions	Outcomes
3. Foster student wellness and resilience to prepare them for lives and careers as health professionals	<p>3A Open SAC wellness center</p> <p>3B Incorporate mindfulness, narrative practice (etc.) into resident and student education on a recurring basis</p> <p>3C Continue and expand activities sponsored by the COM Wellness Committee (e.g., Dr. Jains mindfulness presentation /workshop, COPE series); open these events to PA students as well as UME students and residents</p> <p>3D Continue to support and expand student, resident and faculty wellness activities</p> <p>3E Continue to support efforts focused on student resilience</p> <p>3F Reduce student debt/increase funds available for scholarships to offset expense of medical school</p> <p>3G Reevaluate policies and procedures that have been identified by students as points of frustration (e.g. volume and timeliness of communication, excess paperwork during clerkships)</p> <p>3H Develop a proactive plan to identify and intervene with students who are at academic risk</p> <p>3I Improve and expand the Student Affairs Career Counseling network: recruit new Student Affairs assistant deans; continue to identify, recruit and train faculty and resident advisors; visit Chattanooga, Knoxville and Nashville campuses to identify, recruit and train residency specialty advisors; continue the MPOWER program</p>	<p>3A Construction initiated in 2019</p> <p>3B Continue on a recurring basis for students</p> <p>3C Maintain support to COPE to continue and expand events. Send announcements to PA Program and GME in addition to UME</p> <p>3D Continue for the COM MPOWER Inspire series. Develop student and resident wellness leave policies. Expand wellness counseling. 2019-2020</p> <p>3E Support student initiated COPE Sessions. COPE sessions address topics such as “Self-Compassion”. A given session presents the relevant biology, psychology research, and management techniques followed by discussion/ reflection in small groups.</p> <p>3F Out of state tuition reduction proposed by COM to Chancellor, 2019. Develop Financial Literary Program 2020. see 7A</p> <p>3G</p> <p>3H Plan developed in 2019 to identify M1-2 students at risk of failing either a module/course or Step 1</p> <p>3I Search for new SA dean positions opened. Assc Dean visited all campus to identify additional residency advisors in 2019-2020; efforts continue via Zoom due to Covid</p>	<p>3A Center opened in 2020</p> <p>3B Events continue on an annually recurring basis</p> <p>3C Support continued , topics added by COPE in 2020, COPE series expanded to bi-weekly</p> <p>3D Some events limited due to Covid in 2020. COM Student Wellness Day policy approved 2020; GME wellness policy under development. Virtual resident coping and support sessions offered by GME counselor. Offering of free and confidential weekly virtual support group for residents of color and allies</p> <p>3E Satisfaction in student and faculty surveys.</p> <p>3F Out of state tuition reduced by 10.6%, 2020-2021; further 15% reduction proposed for 2021-2022. Implement Financial Literary Program 2020-2021. See 7A</p> <p>3G</p> <p>3H Plan implemented in 2020</p> <p>3I 3 new SA assistant dean position filled in 2019-2020. New specialty advisors added to the career counseling network. MPOWER continues</p>

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Goal	Initiatives	Actions	Outcomes
4. Prepare graduates to understand and address the social determinants of health in the communities we serve	<p>4A Develop and implement horizontal-vertical Thread on psychosocial factors that impact health, disease and healing</p> <p>4B Implement new social determinants of health module in CMOD by Dr. Snyder. Develop plans to install new relevant content in PCM and Capstone. For PCM, develop plans with CHIPS to train standardized patients (SPs) to perform social determinants and patient adherence encounters. These could also be IPE events (see 1C).</p> <p>4C. See 1G</p> <p>4D disparities and social determinates of health.</p> <p>4E See 6Q and 6R</p>	<p>4A Thread under development by Dr. Nace 2020-2021</p> <p>4B Dr. Snyder to work with CMOD course director to develop 2019-2020</p> <p>4C See 1G</p> <p>4D Solidify a curriculum related to health disparities and social determinates of health, obtain needed faculty input and review of curriculum, obtain approval from CUME, identified experts to teach in this course, and initiate course by the Spring of 2022.</p>	<p>4A</p> <p>4B New topics introduced in 2019- 2020, more to be added</p> <p>4C See 1G</p> <p>4D</p>

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Goals	Initiatives	Actions	Outcomes
5. Prepare graduates as life-long learners, collaborative leaders, and advocates to improve the shifting healthcare landscape	<p>5A Broadcast continuing medical education (CME) events to students and residents.</p> <p>5B Increase self-directed/problem-based learning events in the curriculum</p> <p>5C Train graduates, as experts in evidence based-medicine, to advocate and lobby for healthcare treatment and policy changes</p> <p>5D Continue to work with Dr. Snyder on additional curricular elements once campus-QEP plan is approved</p> <p>5E. See 1H and 6P</p> <p>5F Maintain and continue to expand student research support and counseling: review and update SCORE web pages annually; implement a student research orientation earlier in the M1 year; continue the MPOWER program; appoint a Director of Student Research in Student Affairs; improve identification and listing of faculty research mentors; identify new recurring fund sources to support student research, including presentations at national meetings, hold Town Hall with former Scholar's Year students as panelist for M2s.</p> <p>5G Expand MD/PhD program and explore making it a direct entry program</p> <p>5H Expand resident research training and opportunities:</p>	<p>5A</p> <p>5B</p> <p>5C</p> <p>5D QEP plan approved 2019-2020.</p> <p>5E. See 1H and 6P</p> <p>5F Identify Director of Student Research in SA; explore options with Deans office to increase research funding support centrally. Explore formal mechanism with new Assc. Dean Res. to increase student-department research mentor network. 2020-2021</p> <p>5G To be explored by new Assc. Dean. Res. in 2021</p> <p>5H Identify research faculty lead and faculty mentors; develop resident Research Certificate Program and didactic series, 2019-2020. Goals: (1) minimum of 25 resident and fellow participants per year, (2) 50% of participants achieve certification status, (3) assign one faculty mentor per participant.</p>	<p>5A</p> <p>5B</p> <p>5C</p> <p>5D</p> <p>5E. See 1H and 6P</p> <p>5F Student Research Director recruited, MPOWER and other townhalls on student research and Scholars Year implemented in 2020. Formal research network proposed but on-hold due to Covid.</p> <p>5G</p> <p>5H Residency research network, didactic series and Certificate Program implemented in 2020. Goal 1 met in 2020. Goals 2 and 3 TBD</p>

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Goals	Initiatives	Actions	Outcomes
6. Recruit and retain faculty and staff through development, support, and mentorship	<p>6A Course/module directors and clerkship directors receive appointment in DOME with protected salary equivalent to time commitment or clerkship national standard</p> <p>6B New teaching faculty assigned mentoring team and receive formal feedback (to DOME and primary chairs) in 1st year</p> <p>6C Implement peer-review of teaching program: review and provide feedback to 20% of teaching faculty/year (i.e., all faculty evaluated in 5 years)</p> <p>6D Remediate faculty with consistently negative student evaluations to improve performance</p> <p>6E Grow the Academy of Master Educators program: track faculty appointments in the Academy</p> <p>6F Increase recognition and reward for teaching excellence in the PA Program: initiate teaching awards (e.g., Golden Apple) for faculty and course directors as in UME/GME programs and Caduceus Ball</p> <p>6G Create a tenure track pathway for educators</p> <p>6H Create new promotion metric for educators that does not rely on external or internal research funding</p> <p>6I Provide competitive salaries to education-intensive faculty to match research-intensive and clinical-intensive peers</p>	<p>6A Analyze DOME appointments and salary commitments for teaching role in 2020-2021</p> <p>6B Plan adopted by DOME in 2020</p> <p>6C Plan under consideration by Dean's office/OME</p> <p>6D Proposal to COM Dean approved 2019</p> <p>6E Program initiated competitive recruitment, 2020</p> <p>6F</p> <p>6G</p> <p>6H</p> <p>6I</p>	<p>6A</p> <p>6B DOME faculty recruits in 2020 paired with mentors</p> <p>6C</p> <p>6D Executive & OME Deans provide input to department chair to initiate faculty remediation, ongoing</p> <p>6E</p> <p>6F</p> <p>6G</p> <p>6H</p> <p>6I</p>

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Goals	Initiatives	Actions	Outcomes
<p>CONTINUED</p> <p>6. Recruit and retain faculty and staff through development, support, and mentorship</p>	<p>6J Develop succession plan for retirement of full-time teaching faculty</p> <p>6K Have back up clerkship directors or co-directors for every clerkship across the state</p> <p>6L Recruit full-time educators to DOME with the intent of reducing the number of classroom instructors</p> <p>6M Include primary Department of Medical Education Faculty on COM Promotion and Tenure Committee</p> <p>6N See 5H</p> <p>6O Develop GME Residents as Educators and Faculty as Educators curricula</p> <p>6P Provide residents and faculty with feedback and other data about personal practice habits; involve GME residents and faculty early learners in MUH-UTHSC Patient Safety Collaborative and patient safety event analysis</p>	<p>6J Assess likely near term retirements and recruit or identify replacements in 2020-2021 and beyond</p> <p>6K. Plan approved by OME and Deans office</p> <p>6L See 2B and 6J</p> <p>6M</p> <p>6N See 5H</p> <p>6O GME Residents/Faculty as Educators curricula developed, 2019-2020</p> <p>6P Use ACGME Resident Survey to increase emphasis on this ACGME requirement during Internal Reviews and Special Reviews of programs. Increased emphasis in Internal Reviews and Special Reviews. Encourage use of QR codes to provide immediate feedback to learners and faculty. UTHSC selected as 1/10 sites involved in the 2nd cohort of the patient safety collaborative. Identify shareable patient blood management data between MLH and programs. 2019-2020</p>	<p>6J New faculty recruited to prepare for upcoming retirements in MBNBF and pharmacology, 2020</p> <p>6K Co-Directors appointed to all Memphis core clerkships, 2020</p> <p>6L See 2B and 6J. Goal accomplished for some courses, 2019-2020; needs to be assessed annually</p> <p>6M</p> <p>6N See 5H</p> <p>6O Pilot of Residents as Educators curriculum in Internal Medicine and Med-Pediatrics 2019-2020. Faculty curriculum to begin 2021; metrics developed for assessment of faculty as educators in Department of Medicine for use in annual faculty review to begin January 2021</p> <p>6P Review of 100% of ACGME-accredited program efforts via the internal review and special review process in progress 2020. MUH early learner Patient safety event analysis goal: engage 80% of PGY1 learners and 1st year fellows in patient safety event analysis, in progress. Engage at least 5 PDs of largest programs in blood management QI initiative, TBD</p>

Educate outstanding graduates who meet the needs of the state and its communities			
Goals	Initiatives	Actions	Outcomes
<p>CONTINUED</p> <p>6. Recruit and retain faculty and staff through development, support, and mentorship</p>	<p>6Q Retain student graduates in Tennessee residency programs</p> <p>6R Retain residents to practice in Tennessee communities GME tracking via Annual Program; add state dollars for primary care residencies; develop primary care tracks within Internal Medicine, Medicine-Pediatrics and Pediatrics; development of Primary Care Scholars Program to include 2 certificate options; early identification of hospital faculty needs and advertisement to programs</p>	<p>6Q Provide incentives for graduates to remain in the state; provide more opportunities for tuition repayments that don't come with "ties that bind" – i.e., graduates can get tuition repayments even if they are going into practice in TN suburbia; encourage faculty mentoring and career advising with goal to increase exposure to TN career opportunities; enhance partnership with OME/Student Affairs to analyze match data and student surveys developed by GME to determine factors influencing student residency decisions; GME tracking of student retention by UTHSC and by program. 2019-2020</p> <p>6R GME tracking via Annual Program; add state dollars for primary care residencies; develop primary care tracks within Internal Medicine, Medicine-Pediatrics and Pediatrics; development of Primary Care Scholars Program to include 2 certificate options; early identification of hospital faculty needs and advertisement to programs. 2018-2020</p>	<p>6Q Student survey after Spring 2020 Match and Annual GME tracking of Match data performed, analysis ongoing</p> <p>6R Yearly tracking via APE. Enrollment of first cohort of Primary Care Scholars January 2020. Goal = 50% of graduates remain in TN to practice: 60% in 2019 and 55% in 2020</p>

Educate outstanding graduates who meet the needs of the state and its communities

Goals	Initiatives	Actions	Outcomes
7. Foster and sustain a diverse and inclusive culture where we respect and engage all members of the UTHSC community	<p>7A Increase funds available for diversity scholarships to help recruit more diverse students to the college</p> <p>7B Match the scholarships offered by other schools that lure our diversity applicants away</p> <p>7C Use holistic-based admissions and quantitative data/metrics to ensure quality and diversity of students that interview and matriculate</p> <p>7D. Increase faculty diversity on the key committees (Admissions, CUME, etc.)</p> <p>7E. Develop program to increase GME faculty and resident diversity</p>	<p>7A Asses diversity scholarships to determine if regionally competitive. Dean’s office to liaison with Alumni and Bluff City Medical Society to build diversity scholarship pool</p> <p>7B see 7A</p> <p>7C New holistic admissions rubric created in 2020; metrics to be subsequently tracked</p> <p>7D Committee diversity under evaluation in 2020</p> <p>7E Track GME diversity data - new item on Annual Program Evaluation, effective 2019. GME Diversity Task Force created 2019 and representatives (GME Task Force Chair and 2 residents) to be appointed to COM Diversity and Inclusion Think Tank (DITT). Resident Early Action Program (REAP) – PD and GME notification of promising students by Assoc Dean/ Student Affairs and identification of student/resident mentorship opportunities – not formalized. Create GME supported Diversity and Inclusion Resident Resource Group. Recruit new COM Assc. Dean, Diversity and Inclusion, 2020</p>	<p>7A Assessment ongoing. Networking with Alumni and Bluff City Medical Society initiated but slowed due to Covid. Awarded diversity scholarship increased from 15,000 in 2019-2020 to 25,000 in 2020-2021; projected additional 25,000 increase in 2021-2022</p> <p>7B see 7A</p> <p>7C Revised holistic admissions rubric applied to Class of 2024; further revision and tracking in progress</p> <p>7D</p> <p>7E APE review at GME diversity data 2019. First GME Diversity Task Force meeting by January 2020. GME representative appointment to DITT by December 2019 – met. Communication and strategy development with Faculty Affairs 2019. Search opened for Assc. Dean of Diversity and Inclusion, 2020. REAP progress delayed due to Covid</p>
8. Expand and strengthen key community and other partnership	<p>8A See 6Q and 6R</p> <p>8B Input from Dr. Stewart’s committee</p>	<p>8A See 6Q and 6R</p> <p>8B</p>	<p>8A See 6Q and 6R</p> <p>8B</p>

Clinical

Create areas of clinical prominence while expanding outreach		
UTHSC Goals	COM Initiative	Metrics and Outcomes
<ul style="list-style-type: none"> • Develop targeted areas of centers of excellence • Establish a culture of best practices • Strengthen program quality using performance metrics • Develop and implement community-based and statewide clinical and outreach programs • Expand the scope and quality of integrated clinical practice • Recruit and retain faculty and staff through development, support, and mentorship • Foster and sustain a diverse and inclusive culture where we respect and engage all members of the UTHSC community • Expand and strengthen key community and other partnership • Strengthen organizational effectiveness and adaptability through a focus on a culture of excellence across UTHSC including staff, faculty, and administration 	Restructure UTHSC COM relationship with MLH and Baptist	<ul style="list-style-type: none"> • New master affiliation agreement by Summer 2022 • Expand relationship with Baptist with new agreement in place by Summer 2022
	Programmatic growth and integration with Regional One Health	<ul style="list-style-type: none"> • Develop 2 new multidisciplinary programs, e.g. IBD, by Fall 2022 • Develop the UTHSC-ROH cancer initiative beyond medical oncology e.g. Incorporation of surgery by Fall 2022
	Grow University Clinical Health	<ul style="list-style-type: none"> • Achieve annual profitability • Complete renovation of outpatient surgery center by Summer 2020 • Launch new construction related to outpatient surgery center by summer 2023 • Complete initial renovation of outpatient ambulatory pavilion by Fall 2020 • Launch new construction/renovation related to outpatient ambulatory pavilion by Spring 2024 • Improve quality metrics
	Develop and implement community-based and statewide clinical and outreach programs	<ul style="list-style-type: none"> • Establish 2 new faculty practice plans by Fall 2023
	Expand use of telemedicine based on experience gained during the pandemic	<ul style="list-style-type: none"> • All campus implementation of plan by Summer 2022

Service

UTHSC Goals	COM Initiatives	Description of COM Initiative	Metrics and Outcomes
<p>Offer special events and initiatives to promote health within the community</p> <p>Expand and strengthen key community and other partnerships</p>	UTHSC-Community Education	COVID Pandemic Education for the State of TN	<ul style="list-style-type: none"> • Number of visits to COVID website • Number of events and number of participants/event
		Racism/Social Justice Discussions within UTHSC and our Communities	<ul style="list-style-type: none"> • Number of events and number of participants • Recruit an Associate Dean of Diversity and Inclusion by Fall 2020
	Healthy Lifestyles	Everyone Has a Provider: Provide Frayser residents with access to primary and behavior healthcare	<ul style="list-style-type: none"> • MOUs completed with primary care and mental health providers for outreach and referrals by Spring 2021
		Frayser Community Garden-Healthy Nutrition. Target start date Spring 2021.	<ul style="list-style-type: none"> • Number community residents involved in developing governance structure • Number community residents engaged in garden program • Total number of plots at Frayser Archery Range and back yards • Number of community residents participating in other parts of the garden program • Number of garden plots with schools
		Frayser Physical Fitness: Work with UTHSC Fitness staff to develop fitness program. Under consideration is a walking trail and exercise space alongside a bike trail in development.	<ul style="list-style-type: none"> • Initiation of fitness program with measurements such as number of participants, and frequency an event is offered by Spring 2022
		Frayser Wellness Activities: Work with UTHSC Student Activity Center to include yoga and mindfulness practices.	<ul style="list-style-type: none"> • Initiation of fitness program with measurements such as number of participants, and frequency an event is offered by Spring 2022
	Equitable Health in Neighborhoods	Increase access to primary care, nutrition, physical fitness, and wellness activities in the South City Housing Developments in partnership with member of the COM Board of Visitors. Target start date Fall 2021.	<ul style="list-style-type: none"> • Number of on-site and virtual clinical services (i.e. wellness screenings, vaccines, nutrition/fitness courses) • Number of residents served of the 500 total residents
	Community COVID Initiatives	Tiger Lane and other general community testing sites	<ul style="list-style-type: none"> • Number of tests completes at each site
		Hispanic Testing Event in Collaboration with TN Department of Health and Latinx Community	<ul style="list-style-type: none"> • Number of tests completed
		Complete CDC grant focused on COVID health disparities in communities that are at high-risk and underserved in west TN.	<ul style="list-style-type: none"> • %Population vaccinated in west TN • Number of tests completed

STRATEGIC PLAN FOR RESEARCH
UTHSC COLLEGE OF MEDICINE
DECEMBER 7, 2021



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INTRODUCTION

Background

The mission of UTHSC, and thus the COM, is to improve the health and well-being of Tennesseans and the global community by fostering integrated, collaborative, and inclusive education, research, scientific discovery, clinical care, and public service. Research at the University of Tennessee Health Science Center (UTHSC) College of Medicine (COM) has been surviving, but not thriving, for the past ten to 20 years. The reasons are multifactorial and include, notably, increased competition for National Institutes of Health (NIH) dollars that failed to sustain the nationwide biomedical research enterprise it had generated after the doubling of its budget in the 1990s. A comparative lack of support from the state of Tennessee has also hindered the ability of the COM to compete on a national and worldwide scale with institutions located in states that recognize and receive the social benefits of investment in biomedical research and the economic returns from that investment. A third factor is a focus on short-term opportunities without a successful comprehensive strategy to evaluate and create an institutional organization and culture for sustainable growth. The COM cannot expect long-term growth if it does not pay attention to the fundamentals of creating and evolving an environment in which outstanding science and scientists thrive in the COM.

The UTHSC Office of Research coordinates and produces an Operational Strategic Plan for Research (OSPR) for all of the UTHSC Colleges and campuses across the state. The second edition of the OSPR was completed as this COM plan was being written. The COM plan is intended to complement the OSPR in two ways. The first is to more fully develop, when possible or necessary, ideas and themes from the OSPR. The other is to develop ideas and proposals which may not be covered by the OSPR. The goal for this COM plan is to lay out plans and priorities for the COM.

Guiding principles

First, the vision and plan for research should recognize and leverage the statewide structure of the COM with campuses not only in Memphis, but also in Knoxville, Chattanooga, and Nashville. Second, the plan should satisfy requirements for accreditation by the Liaison Committee on Medical Education (LCME) of the American Association of Medical Colleges (AAMC). A strategic plan for research had to be submitted in 2020 for the LCME accreditation process scheduled for fall of 2021. Given the recent arrival of the Senior Associate Dean of Research in July of 2020, that plan was process-oriented with metrics related to completion of processes rather than meaningful research outcomes such as publications, programmatic changes, or funding details. In short, the LCME strategic plan for research is a plan for a plan. This current document is the product of the LCME plan-for-a-plan. LCME metrics that are met by elements of this strategic plan for research are included within the text and indicated with brackets. Third, the COM Strategic Plan for Research should recognize the priorities and plans set forth in the UTHSC Operational Strategic Plan for Research (OSPR), whose second edition was just completed, in order to optimally align with and leverage UTHSC institutional investments, resources, and opportunities.

Vision

The vision of the Executive Dean of the College of Medicine, Scott Strome, is to grow research in a way that engages with and benefits our communities. The benefits may be improved physical, emotional, or mental health, increased financial well-being associated with an invigorated economy, or educational training and opportunities. Specific examples include, but are not limited to, access to participate as subjects in clinical trials, as well as employment opportunities. Our communities include the UTHSC community as well as

fellow citizens of Tennessee and neighboring communities and states. Entrepreneurship is a key opportunity to accomplish this vision. Entrepreneurship offers the opportunity for UTHSC and its scientists to translate their discoveries into ideas and things that improve health and advance science, while also providing an economic engine to support our mission and drive regional economies and opportunities for the community.

Cross-cutting themes

Sustainability. UTHSC does not have the resources to take major strategic risks in research without damaging its existing research portfolio. Institutional history predicts that major investments in *de novo* programs and science that do not leverage existing strengths are likely to fail. Well-intentioned but risky investments drain resources away from basic investments needed to sustain a viable, competitive research enterprise. This plan seeks to build a contemporary foundation for a sustainable research enterprise whose organization and culture is poised for continuous positive growth and adaptation to an ever-evolving scientific environment. COM research planning requires a long-term perspective.

Excellence. There is no substitute for excellence in a plan for sustainable research. UTHSC culture seems to have established funding as the target but funding should only be one metric. Too many COM scientists have fallen off a fundable scientific trajectory and the COM must learn from this history. The COM needs to wean itself from relying on bibliographies and funding history, study sections and journal editors, to judge science and scientists. Assessing the talent and potential of scientists and their science requires work (e.g., reading papers, not just titles and journal names) and judgment. The College must return to a cultural focus on excellence in science, not just success in funding. Excellence should become a part of our cultural fabric that extends to recruitment, retention, and development of our scientific faculty and trainees.

Diversity. Diversity matters for excellence and innovation of an organization. We cannot fulfill our mission if our workforce looks different than the community we serve. UTHSC is competing against institutions across the world for the best (scientific) talent. The COM cannot afford to miss out on the ever-increasing majority of potential recruits, especially underrepresented candidates, that seek an inclusive, equitable, diverse environment. We may not be able to compete with the financial support of many other institutions, but our organizational culture must compete effectively with others if we are to remain a viable scientific institution. We must be intentional and strategic in our efforts to build a diverse scientific workforce.

Mentoring. The faculty, staff and trainees of the COM are its most important assets. The COM must do everything possible to maintain and grow this asset for long-term sustainability. The COM research enterprise will not thrive in a sustainable way if it is not continuously focused on training, developing and mentoring the next generation of scientists. This is especially true for an organization which has to heavily rely on growing its own scientific, clinical, and educational leaders.

PROCESS

This plan was conceived and will eventually be completed in a total of five phases: Planning (the process), Focus Groups, Writing (the initial draft), Town Halls, and Final Revisions.

Planning. This phase involved articulation and refinement of the vision for research in the COM, cross-cutting themes and goals of the plan, and developing the process. This first step in the process was coordinated by the Senior Associate Dean of Research (SADR) with assistance and input from stakeholder groups across UTHSC and the COM.

Focus Groups. This phase included dozens of meetings with stakeholder groups across UTHSC and the COM as well as with rank-and-file COM faculty. These meetings were conducted virtually by Zoom due to social distancing requirements. The meetings were facilitated by the SADR, who also took detailed notes. Each of these meetings was focused on one of 8 questions:

1. What are the barriers to scientific success and funding?
2. How do we incentivize cross-disciplinary and cross-department research, especially clinical-basic collaborations?
3. How do we grow a cadre of physician-scientist faculty engaged in externally funded research?
4. How do we sustain and grow the quality of our research training and trainees?
5. How can we increase recruitment and retention of underrepresented trainees (and staff and faculty)?
6. What are best practices for faculty recruitment and how do we implement them?
7. What are best practices for faculty development and how do we implement them?
8. What are best practices for faculty retention and how do we implement them?

Writing. This phase relied upon a COM Strategic Planning for Research Committee to review, discuss, and ultimately decide what content from all of the notes from all of the focus groups would be incorporated into the initial working draft of a written Strategic Plan for Research. That content was initially organized according to the focus group questions, although most of the content cut across multiple focus group questions and elements of this plan. Therefore, the content was rearranged into its current format for clarity and fluidity.

Town Halls. This phase included wide distribution of the initial draft of this plan to the faculty, staff, and trainees of the COM and stakeholders across UTHSC. Wide engagement, discussion, and feedback was actively sought. Six widely-advertised Town Halls were held in order to reach and engage as wide an audience as possible. These meetings were conducted virtually by Zoom and were facilitated by the SADR, who also took detailed notes. Feedback in other formats (email) was invited and received.

Final Revisions. This phase involved collation and organization of comments and ideas elicited in the Town Halls phase. These comments and ideas, along with a modestly updated version of the plan, were made available to the COM Strategic Planning for Research Committee for their review and discussion. Final edits and revisions were made to the plan which was then submitted to the Executive Dean of the COM.

CHALLENGES AND OPPORTUNITIES

Institutional financial support

Research growth in the COM will continue to stagnate or atrophy without better support from UTHSC. Current support is inadequate and inefficient due to a lack of alignment of roles, resources, and responsibilities between the COM and the UTHSC Office of Research. The COM requires a substantial increase in direct financial support from the chancellery which can and should be achieved with reorganization of resources to more directly support the COM where 80 to 90 percent of all research at UTHSC is conceived and conducted. Most of the current support is managed and distributed by the Office of Research, which both reflects and contributes to this misalignment.

The COM must identify and leverage additional streams of revenue to support its research mission. A focus on support from the state of Tennessee and philanthropic sources should be reinvigorated. Support from the state of Tennessee will likely require a statewide COM research strategy that improves the medical, economic, and social well-being of citizens and businesses across the state of Tennessee. Finally, the COM campus in Memphis is entering a new landscape of clinical care which it can and should be leveraged to support, organizationally and financially, its science and scientists.

Institutional resources and infrastructure

An impediment to COM scientists and staff fully leveraging UTHSC research resources is a lack of awareness of those resources. Although the information is available online and in other formats, it is organized according to administrative structure and not functionality to the scientist. What scientists want and need is a fundamental reorganization of online information. In the absence of that reorganization, they need some other resource that ties all of the information together in a functional, user-friendly way. There are several options to accomplish this. One is to organize and update the COM research website into a format that allows users to click on a function or question that takes them to the relevant administrative unit, without already having to know the name of that administrative unit and where it is located within UTHSC. New or infrequent users cannot be expected to remember all of the names and functions of organizational units and to have to browse through multiple sites to find what they are looking for. Another option to facilitate the user experience is to assemble a handbook or dashboard which could be provided to new faculty or trainees at the beginning of a COM appointment. It is understood that some functions will be College- or department-specific, so a comprehensive resource may have to either exclude "local" functions or be adapted to administrative units. Another option is to have a designated hot line or helpdesk to answer questions. In any case, this is an opportunity to work with other Colleges campuses and their Associate Deans of Research to improve utilization of research resources and infrastructure across UTHSC. [LCME metric: Develop a consistent orientation to research administration in the COM for new faculty and principal investigators]

One easy opportunity to increase efficiency and facilitate research is to identify and support a system to help researchers locate instruments and equipment across the COM and, hopefully, UTHSC. This is particularly germane to rare and costly instruments which are infrequently used and may be stored somewhere out of site and memory. A central resource that tracks the existence and location of selected equipment would facilitate exploratory research by scientists who do not have the equipment but need it to pursue a creative new idea. This happens frequently, especially for scientists in clinical departments who are more isolated from other scientists across the COM and UTHSC. There are several tools that can be adapted to accomplish instrument sharing, including Slack, which would require an institutional

subscription, or Microsoft Teams, which has the required functionality and is already part of UTHSC enterprise computing. The best solution to this type of problem arises organically from the scientists in the laboratories. The role of the COM leadership should be to catalyze and support the effort. [LCME metric: Develop and disseminate best practices and policies to optimize sharing of instruments across the COM]

Building a community of scientists

Many COM scientists report a lack of a feeling of connection and community. There are several underlying factors leading to this that can be addressed. The first is simple: a lack of a comprehensive list of UTHSC faculty that can be easily and accurately searched according to research interests. This is also a major, if not documented, problem for recruitment of scientists and trainees at all levels who rely upon this functionality to assess UTHSC and COM science and scientists. The Tennessee Clinical and Translational Science Institute (TN-CTSI) has established a database of all UTHSC faculty but it is incompletely populated with faculty since inclusion is voluntary. One obstacle is the misperception, both among faculty mentors and trainees, that the TN-CTSI database does not include basic scientists. Since the TN-CTSI database is a requirement to be competitive for an NIH Clinical and Translational Science Award, and UTHSC does not need a duplicate database, the best option is to educate the faculty and trainees in order to fully populate and leverage the database that UTHSC already has.

Plans are underway in the COM to publish a quarterly newsletter. This newsletter will be a venue in which to highlight and recognize COM scientists and their science and accomplishments.

In addition to the faculty and research directory described above, a valuable and critical asset is the Senior Associate Dean of Research in the COM, Andrew Griffith. He can serve as a matchmaker, catalyst and coordinator for relationships and collaborations inside and outside the COM. However, a catalyst is not always required if the conditions are right. Many of the best ideas occur over a meal or a beverage in a social environment that promotes creativity and thinking free of the (self-imposed) constraints that may subconsciously inhibit out-of-the-box ideas in a formal work environment. UTHSC has the lobby-atrium of the Madison building complex, as well as other areas for scientists to gather. Some COM scientists have voiced a desire for a faculty club or other physical and social hub. The newly renovated Mooney library is an option for a hub. Finally, as new buildings are constructed or renovated on campus, we encourage their design to recognize the critical role of social hubs to catalyze research.

One foundational connection in a “translation-ready” biomedical research community is the bridge between those who practice clinical medicine and those who conduct research. The two communities are not mutually exclusive. The overlapping domain is occupied by clinician-scientists, but their numbers are low and intentional effort is required to bridge physical, cultural, and organizational divides that separate the basic scientists and clinicians. [LMCE metric: Develop and disseminate a systematic plan to enhance connections between basic scientists and clinicians] There are several mutually non-exclusive opportunities to accomplish this:

- 1) Include Chairs of clinical departments that include research, or their Chair-surrogates, in the meetings of research-intensive Chairs that occur monthly.
- 2) Create a small working group that includes basic science Chairs, team- and research-oriented clinical Chairs, and a DFAC representative to identify and leverage opportunities for interdisciplinary and inter-departmental interactions.

- 3) Create or reinvigorate scientific meetings, workshops, seminars, symposia, conferences or retreats to catalyze and facilitate interdisciplinary communication and collaboration. Further planning and implementation could be the initial purview of the working group described above. Refreshments are known to incentivize participation in these events and, depending on the time and venue, these could also take the form of happy hours which are beloved by some, but not all. Some specific ideas include:
 - a) Joint basic/translational science-clinical talks for grand rounds at clinical departments;
 - b) Clinicians present their questions and challenges to audiences of basic/translational scientists;
 - c) Human disease-focused seminar series that includes both a clinician and a basic/translational scientist (e.g., a clinical case followed by the underlying cellular-molecular-physiologic pathogenic mechanism)
 - d) Mini-TED talks, a format utilized by the Graduate School of Medicine in Knoxville.
 - e) Inter-disciplinary, trans-College continuing research education discussions of important, sometimes provocative, topics related to the conduct of research and research training (e.g., what is the biggest mistake you have made in research?).
- 4) Encourage and support the appointments of non-clinician scientists in clinical departments. This can foster an environment of scholarship and investigation. There are multiple examples of this in the COM. Joint appointments with research-intensive departments can be very helpful for these individuals to provide access to peers, instruments, trainees, and other research support that may be lacking in a clinical department. Faculty conducting independent basic or laboratory-based research in clinical departments more frequently and fervently report challenges with administrative and financial support of their research than do their peers in research-intensive departments. However, the appointment of non-clinician scientists to support research programs led by other faculty, especially clinical research programs, has been successfully implemented in several departments.

Connections with engineers are important and have led to many of the discoveries and inventions that have profoundly improved science and clinical care. An approach utilized at other institutions is to have engineers “shadow” physicians on rounds in order to provide firsthand exposure to challenges and problems that clinicians may not even realize has a potential engineering solution. The location of the Tickle College of Engineering at the University of Tennessee in Knoxville is ideal for clinicians and scientists in the Graduate School of Medicine in Knoxville. Efforts are already underway to bring those communities together. The Tickle College of Engineering has also expressed interest in sharing interests and ideas with the COM community in Memphis. The Dean of the Tickle College of Engineering has recently stepped down and the fate of this initiative is currently unclear. However, the COM working group on bench-bedside interactions could explore this opportunity. [LCME metric: Leadership from the COM and the University of Tennessee Tickle College of Engineering will plan and host at least one interactive event for faculty from both Colleges to discuss research interests and potential collaborations]

Leveraging entrepreneurship

Growing entrepreneurship to attract investment and create jobs in Tennessee is a central tenet of the vision for research in the COM. Entrepreneurship is also a great opportunity for scientists to support and grow their research programs. In order to reinvigorate a culture of entrepreneurship on the COM campus in Memphis, the Dean has initiated individual Departmental innovation tours in which he and Dr. Richard Magid (Vice President of the University of Tennessee Research Foundation (UTRF) at UTHSC, and manager of operations in the Memphis office of UTRF) meet with the faculty of individual departments. In these meetings, faculty members each present an idea with commercial potential for critical analysis and feedback. The short-term expectation is that at least some of these presentations and discussions result in invention disclosures. The long-term strategy is that this innovation tour is one event in an ongoing series of activities to increase knowledge and interest in entrepreneurship.

Improving health and well-being

Another central tenet of the vision for research is improving the health and well-being of our communities. One tangible way to accomplish this is to continue to foster and grow clinical research and clinical trials in Tennessee. All four of the COM campuses in Memphis, Knoxville, Chattanooga, and Nashville should leverage established UTHSC infrastructure to continue to support the growth and conduct of clinical trials across the state of Tennessee. This brings the latest cutting-edge treatment opportunities to the citizens of our communities and Tennessee, and it attracts top talent across the spectrum of health care to Tennessee. [LCME metric: Increase number of clinical trials at each campus]

In Memphis, the evolution of the relationship of the COM with its hospital partners is providing new opportunities for growth of clinical research. A primary emerging partner is Regional One Health, which has physical adjacency and philosophical alignment with the COM. Regional One Health, as a safety net hospital, has a patient population that would greatly benefit from the cutting-edge clinical care providers and researchers of the COM. Establishing a robust infrastructure to support clinical trials and research at Regional One Health is a priority and has already begun. [LCME metric: Establish clinical trials infrastructure at Regional One Health]

The BIG (Biorepository and Integrative Genomics) Initiative is a signature project of the COM and LeBonheur Children's Hospital to facilitate highly effective genomics-based research to support future personalized healthcare delivery platforms. Importantly, the patient volunteers for BIG are residents of Memphis and, increasingly, other sites around the state of Tennessee, including the Quillen College of Medicine of Eastern Tennessee State University. These volunteers are, in most cases, either underserved or underrepresented and stand to benefit from a research approach and project whose goal is to individualize healthcare to meet their needs. BIG is an opportunity for UTHSC to marry its strength in informatics and genomics with its strength in clinical care and translational research. The barrier to full leverage of this opportunity is education, incentivization, and support of the potential users of BIG. The education component of this plan is underway as the Dean has asked every COM department Chair to designate a BIG champion within their department. The scientific leaders of BIG are willing and available to meet with faculty and departments to explain BIG and provide examples of what can be accomplished to benefit patients and research. Moving BIG from an idea to actual research may be accelerated through intramural COM grants that require cross-disciplinary collaborations that would otherwise not happen.

Stimulating interdisciplinary research

Funding is required to stimulate and support the formation of interdisciplinary collaborations. Interdisciplinary research that does not span more than one College is not eligible for a UTHSC Cornet award. The COM once offered intramural grants to support interdisciplinary research, with one grant criterion stipulating the potential for intellectual property and commercialization. This is a worthy approach that deserves exploration for re-implementation. Eligibility criterion should be rigorous and include interdisciplinary collaboration that spans departments, if not Colleges or campuses. Potential for significant external funding and commercialization of intellectual property should also be eligibility criteria.

Administrative support of research

Conducting excellent research is challenging enough without having to do it in (relative) isolation. COM scientists conducting research in clinical departments more frequently and fervently, in comparison to their counterparts in research-intensive departments, report challenges with administrative support. This is especially common for support related to grant preparation and finances. It is imperative to address this challenge in order to maintain, if not grow research in clinical departments. Clinician-scientists, due to their “dual existence,” do not have time to compensate for administrative support that is lacking in breadth or expertise. This is also a retention issue. Scientific and administrative leadership in the COM leadership should prioritize this issue to identify root causes and solutions.

Adapting organizational architecture

The organizational architecture of research administration and support in the COM has not kept pace with the evolution of the most impactful biomedical research into a highly multidisciplinary endeavor. Many scientists report feeling scientifically isolated, if not physically isolated, from their peers across the COM and UTHSC. Although the current COM departmental organization may be appropriate for administrative functions and support, it is a barrier to the conception and conduct of innovative research. Silos remain around individual departments and even within departments. Although science and scientists at all levels are negatively impacted by silos, this is especially important for and evident in mentoring, including peer-mentoring and interactions, of faculty. It is also evident in submitted research grants and papers, which should ideally be internally (or externally) reviewed by peers before submission. This peer-review does not happen in some departments, and it does not happen as much as it should in many departments.

Different institutions have adapted to the changing landscape of science in different ways according to their mission, physical layout, and other factors unique to each institution. However, there are some common themes. One is the existence of extra-departmental groups and units, often in the form of trans-institutional institutes or centers, that act as a scientific nidus for research, research training and education, and recruitment. This organizational architecture has become the norm for successful biomedical research institutions.

Institutes and Centers are logical units for recruitment and retention of research faculty. Although it is true that administrative appointments are made by and into departments in the COM, it needs to evolve from department-centric recruitments to the contemporary model of broad, trans-institutional cluster and cohort hiring. This model has many advantages for the institution and its faculty. First, it is an effective approach to increase the diversity of faculty. It is conducive to joint recruitments and appointments of faculty that bridge departments and disciplines. Since search committees span Departments and even Colleges, the process of the search itself enhances trans-institutional connectivity and leverages the full

breadth and depth of institutional expertise for each search. It reduces guesswork and legwork for potential recruits since they do not have to rely on specialty organization and compartmentalized advertising to identify searches and positions. By repeating the process every year with successful recruitments, the process and institution can become branded. Third, the feeling of being in a trans-institutional cohort is attractive to new recruits, providing a sense of belonging and a group of peers for professional and social support. Transdisciplinary cohorts are an effective way to generate the trans-institutional connectivity which the COM needs if it is to successfully recruit and retain outstanding faculty who are competitive for robust external funding.

An obstacle to trans-institutional recruitments is the perceived loss of control by Departments and Chairs, especially those Chairs who already have recruitments promised to them. It is not unusual for Chairs to be slow adopters of trans-institutional recruitments, so one approach is to initiate the process by recruiting into positions that are not held, or solely held, by any one Chair or Department. This way they can see how the process works to increase the quality and diversity of faculty recruits. The Executive Dean (Strome) has delegated a finite number of faculty recruitments to the SADR, who plans to develop and implement this mechanism in the COM. There are additional mechanisms to encourage wider adoption and implementation of this hiring model. These include attaching an honorific title to those faculty recruited through a trans-institutional process, and the provision of additional COM support to the recruitment package.

The National Institutes of Health recognizes the added value of cohort-cluster hiring and has already solicited a first round of applications for NIH FIRST awards, which offer generous support for institutions implementing cohort-cluster hiring of faculty. This contemporary model for recruiting is something the COM cannot ignore if it seeks to compete for, develop, and retain successful faculty in the future. Finally, all of the UTHSC Colleges and campuses could consider adopting this approach for faculty recruitment across the entire institution. Initiating this mechanism for faculty hiring would improve our competitive status for the next round of NIH FIRST awards.

Strategic management of research space

There is currently no strategy for managing research space across UTHSC or the COM. Space is assigned and managed in a reactive fashion that is supposed to adhere to the UTHSC policy for research space. However, this is a policy that serves as a guardrail. It is not a strategy to leverage space to optimize the scientific environment and productivity. Some research faculty, especially those appointed in clinical departments, report dissatisfaction with their laboratory space because they are not adjacent or proximal to other scientists with similar interests, techniques or instruments. Physical adjacency and proximity to “good neighbors” is conducive to good research and research training, as well as recruitment and retention of trainees and faculty. It can also lead to cost-efficiencies. Furthermore, laboratory space that is no longer being used by productive scientists must be more efficiently and fully cleaned and vacated. This is important for efficient utilization of space as well as recruitment and retention of faculty. The SADR will work with Department Chairs to craft a transparent strategy and policy to address these issues. Those buildings that house scientists from multiple Colleges and Departments are in the most immediate need of such a strategy.

Recruiting a diverse scientific faculty

Diversity and inclusion are important for excellence and innovation and critical to the success of the COM in fulfilling its missions, including research. The COM is taking important steps toward identifying,

addressing, and rectifying issues related to equity, diversity and inclusion in the COM. These include the formation of a new committee to address these issues that pertain to women. The Executive Dean has also created a new position and appointed Dr. Claudette Shephard to be the inaugural Associate Dean of Diversity and Inclusion of the COM.

The COM must develop and implement a strategy, policies and practices to recruit and retain a diverse scientific workforce, particularly at the faculty level. The SADR has worked with the Associate Dean of Diversity and Inclusion, Associate Dean of Finance and Administration, Senior Associate Dean of Faculty Affairs, and Department Chairs to develop a shared vision for diversity and best practices for recruitment of a diverse faculty. The latter is undergoing revisions before eventual review and approval by the Executive Dean. [LCME metric: Develop and disseminate best practices for recruitment of faculty conducting research] In addition to cohort-cluster hiring, described above, the COM should consider a strategy to brand itself in order to distinguish itself from other institutions. There is currently no brand, and the void tends to get filled with negative misperceptions of UTHSC, Memphis, and Tennessee. UTHSC and the COM should identify one or a few of the many research advantages and opportunities that it enjoys and employ a strategy to communicate these features to our peers across the country and world.

Retaining a diverse scientific faculty

Retaining our best and most successful faculty must be a high priority. There is at least one simple thing the COM can do to enhance the personal and professional satisfaction of its faculty: better highlight the faculty and their scientific successes. This can be done through existing mechanisms, such as UTHSC news stories, but also in new ways such as a COM Newsletter and well-positioned video screens in public areas around campus. There is also an opportunity for more formal recognition of faculty achievements in research (as well as teaching, clinical care, and community service). Reinvigorated trans-College retreats, seminars, and meetings would be ideal venues for the faculty to be recognized by COM leadership in the presence of the entire community. The COM should orient applause and accolades more toward scientific achievements and not so much on research funding. Research funding is recognized in other ways such as increased space, promotions, and salary raises. Very few scientists pursue a scientific career because they want to write grants; we do science because we love science. A renewed focus on science, not the funding behind it, would be healthy for our scientists. Moreover, this would also offer opportunities for the scientific community to read and learn, at a non-expert level, about exciting advances and insights made by their peers. A focus on science would build a sense of community, not a sense of competition. The COM must put the “S” back in UTHSC.

The most substantive requirement to recruit and retain a diverse, thriving scientific faculty, is a strong culture of mentorship. Mentorship should be happening at all levels of an organization. It should not end when a postdoctoral fellow becomes a faculty member. It should not end when a faculty is tenured. It should not end when a faculty member becomes a Chair and it should not end when a Chair becomes a Dean. All of the links in the chain of mentoring need to be strong in order for an organization to thrive, not just survive. Diverse candidates, in general, place greater value and emphasis on mentoring than their non-diverse peers and UTHSC must have a robust mentoring culture in order to recruit and retain a diverse scientific workforce. [LCME metric: Develop and disseminate best practices for development, support and mentoring of faculty conducting research]

First, mentorship of faculty should be formalized across the COM. Although this plan is focused on research faculty, the Office of the Dean of the COM is in the process of formalizing mentoring for all faculty regardless of their duties. This policy will require mentoring committees for all tenure-track faculty and best practices

for committee composition, frequency of meetings, and purview of mentoring committees. The broader mentoring plan will include a framework to ensure that all faculty have peers and mentors available to review their grants prior to submission. A broader plan must recognize and incentivize senior-level mentoring of junior faculty, and it must hold Chairs accountable for mentoring their own faculty and for holding their faculty accountable for mentoring junior faculty and trainees. Although this plan focuses on mentoring of faculty members, with special emphasis on mentoring of junior and mid-level faculty members, mentoring of trainees is equally, if not more, important. However, concerns about trainee mentoring cannot be addressed without mentoring the faculty members who mentor them.

Growing a cadre of physician-scientists

The COM is not alone in its struggle to maintain a nucleus of physicians engaged in scholarly investigation. There is a nationwide dearth and dwindling numbers of physician-scientists. It is important for the COM to recognize and overcome, as best as possible, local forces responsible for the situation at UTHSC. First and perhaps most significantly, faculty practice plans incentivize clinical productivity and disincentivize research. It is a major commitment and challenge for the COM to provide enough protected time for the principal investigator of a research program to become established, which can take up to four or five years. It is a major commitment and challenge for senior faculty and leaders to provide mentoring, often at the expense of their own research programs. Finally, it is a major commitment for the physician-scientist, with personal and financial consequences that extend to their family. The level of commitment from all parties requires a thoughtful and intentional approach to the issue at UTHSC. How do we try to patch and feed into the pipeline? The “grow your own” approach has been successful at many institutions (e.g., Washington University) and is the most feasible and sustainable strategy for UTHSC.

There is infrastructure for the development of physician-scientists in the COM. The Tennessee Clinical and Translational Science Institute (TN-CTSI) has been supported by robust institutional investment from the Chancellery. It is an important resource for career development, grant writing, and other aspects of clinical research and clinical research training. It is not clear that every Department and candidate leverages this resource. There is also a maturing infrastructure to support the conduct of clinical trials and clinical research across the COM campuses and the state of Tennessee. The VA, in general, and the Memphis VA Medical Center, in particular, provides a wonderful opportunity for physician-scientists to establish and build their research careers. Regional One Health is emerging as the primary hospital partner of the COM in Memphis. Its location within the medical campus and its institutional commitment to supporting scholarship and research should facilitate recruitment and retention of physician-scientists in Memphis. However, significant investment is required to build and maintain clinical research infrastructure at Regional One Health if it is to become the flagship medical center for COM clinical trials.

The Executive Dean now requires that all Chairs have a plan for research in their departments. The range of Departmental plans for research is expected to be broad, given the wide inter-departmental variation in culture and current status of research. Those Departments with the financial and mentoring capacity to support a physician-scientist should be encouraged to recruit or develop internal candidates with the requisite training and motivation. Chairs must provide sufficient protected time, mentoring, resources, training, and space for the development of the physician-scientist. It is the responsibility of a properly composed mentoring committee to continuously assess the environment and resources and to provide their recommendations to the Chair. The Senior Associate Dean of Research will serve as a primary resource from the Office of the Dean to assess and advise, as needed, on the mentoring of physician-scientists on the Memphis campus. Research mentoring ability is a critical skill for a Chair and should be an important selection factor in future Chair recruitments.

Few departments have the financial resources to develop physician-scientists until that person can obtain a major grant (e.g., an NIH K or R grant) to support their salary. The COM or UTHSC should consider a centrally supported physician (clinician)-scientist training program to support junior physician-scientist faculty. The Dean's Faculty Advisory Committee (DFAC) has developed a detailed proposal for such a program. The program is essentially an "internal K" career development grant to support physician-scientists until they are competitive for NIH funding, such as an R or K grant. It is a meritorious approach whose implementation should be guided by a close analysis of previous attempts to do this at UHTSC, e.g., as part of the CTSI. It should have rigorous eligibility criteria and compelling evidence of the commitment of the Chair, candidate, and Department to the training plan. The COM must first address challenges to conducting research in clinical Departments to ensure optimal support and development of these candidates.

Given the relatively small size of the COM and its strengths in some, but not all, areas of research, the COM should give special consideration to those physician-scientists whose programs align with proven areas of strength at UTHSC. This includes population health sciences, minority health and health disparities, and clinical-translational research (T1 to T4). This may be an area where we can most significantly augment the pipeline at the early faculty level since many, if not most, faculty who have completed their clinical training lose interest, if they ever had any, in research at the basic (T0) stage. The UTHSC College of Graduate Health Sciences (CGHS) currently offers certificate and degree tracks that train clinicians to do clinical research. These include an M.S. in Epidemiology with concentrations in Clinical Investigation or Data Science, as well as a certificate in Clinical Investigation or in Healthcare Quality Improvement. The COM should continue to educate its faculty and mentors about these opportunities and encourage and support those faculty who choose to pursue these opportunities.

The organization of the UTHSC COM clinical care enterprise, especially in the domain of adult care structural hurdle to growth of a cadre of physician-scientists in the COM. There needs to be improved alignment of the vision, especially as it pertains to research, with our health care partners, especially with, but not limited to, the Veterans Administration Medical Center in Memphis and Regional One Health. This could be accomplished through the establishment of a joint council, comprised of leadership from both the COM and the clinical care partner. Similarly, faculty practice plans can and should be more attentive and responsive, in terms of their structure and organization, to the research mission of the COM and research operational needs of the faculty and leadership.

The pipeline of UTHSC medical students entering physician-scientist careers appears to be quite small. Career outcome data has not been systematically collected. The MD/PhD program is not a truly integrated dual degree track and is in need of updates and improvements (see below). It is very small, with approximately one student per year from a medical school class of over 160. There is much room and need for growth of this pipeline. A more detailed plan is described below.

Building a biomedical research workforce

Research and research training are so deeply intertwined in an academic institution that a strategic plan for research must consider challenges and opportunities related to research training. Since graduate students are recruited through and enrolled in the UTHSC College of Graduate Health Sciences (CGHS), we must continuously engage with the CGHS on how to best accomplish our shared mission.

There is enthusiasm for more focused recruitment efforts among the undergraduate populations of Tennessee institutions, especially those serving underrepresented groups. The University of Tennessee undergraduate colleges are recognized as an incompletely tapped source of potential graduate students. Recruitment of outstanding scientific talent in our own Tennessee institutions is not only important for the COM, it is important to recruit and retain a trained scientific workforce for all sectors of the state: public and private, corporate and academic, for-profit and non-profit. Building a trans-Tennessee, trans-institutional pipeline of biomedical research scientists should be a priority of UTHSC.

The COM has a weak and remote history of supporting research training through institutional training grants. The ability to support graduate students through this mechanism would enhance our ability to recruit high-quality students in our areas of strength. UTHSC, the CGHS, and the COM should encourage our scientists to explore the options for NIH institutional training grants and whether or not there are opportunities for which we are currently competitive or could be competitive. One criterion to consider is whether we have a sufficient quantity of NIH-funded scientists and projects in within a grant's mission area. Submission of an institutional training grant application would require grass-roots support because the application is doomed to fail without it. This effort will require support from UTHSC, the College of Graduate Health Sciences, the COM, or any combination of these.

Another metric used to evaluate an institutional training grant application is the existing record of individual training grants and outcomes. Submission of individual training grants occurs sporadically, at best, across the COM. One reason for this is lack of interest of the mentor and principal investigator. Many mentors are not willing to invest the time and effort required by themselves and the student due to the perceived loss of research and data productivity while preparing such an application. If the COM aspires to an institutional training grant in an area, it could consider incentivizing the submission of individual training grants with additional resources or funds to principal investigators and laboratories that receive such grants.

UTHSC medical students are an outstanding source of motivated, capable research trainees who are coveted by many, if not most, of the research faculty. These faculty had suggestions to more deeply integrate medical students into research programs of the COM. These include more aggressive incentives for our best medical students to pursue careers in investigative medicine. One easily implemented incentive could be recognition and presentation of awards for meritorious research to graduating medical students. Another strategy is to funnel more resources to student who have the "fire in the belly" for research and are not simply seeking to enhance their curriculum vitae for admission to competitive residency programs. Perhaps most important is considering changes to the curriculum to include the option of an enhanced longitudinal research experience, a 4th year that is research-intensive, or a combination of these strategies.

The COM has a modest, loosely structured MD/PhD training program. The program would benefit from better integration of the MD and PhD training tracks. A structural issue for integration is the requirement for the students to be enrolled in the CGHS, or even at St. Jude Children's Research Hospital, for their graduate research training. Since the student is not enrolled in the COM, they cannot engage in clinical activity since their activity is not covered by malpractice insurance, which is an important problem for some of the students and a likely barrier to recruitment of MD/PhD students. Efforts are currently underway to remediate basic issues of integration, including a plan to formalize the dual-degree track as part of our LCME accreditation of the COM.

It is widely recognized that MD/PhD students are an extremely talented and motivated source of research trainees. MD/PhD students are often primary drivers of ideas and productivity in the research programs and laboratories of their mentors. The COM should prioritize the opportunity to enhance and grow the

MD/PhD training program and pipeline. In order to compete for these highly coveted students, the COM should consider branding this program with our distinctive strengths in research. One of our distinctive strengths is population health science, including studies of minority health and health disparities, and consideration should be given to a PhD training option in this discipline. This would dovetail with a COM-wide research strategy to focus on these areas of strength.

UTHSC MD/PhD students currently have only one option, other than loans and personal finances, to fund the cost of their lengthy training, particularly medical school training. There is no institutional or state support. Some students apply for and receive F30 grants to support their research and medical training. This is helpful but does not cover the first year of medical school. Furthermore, not all MD/PhD students apply for F30 grants. Although many, if not all, students are supported by the institution, the mentor's research grant(s), or a combination of these during their PhD training, they are still responsible for the last two years of medical school if they do not receive an F30 grant. The burden of medical school debt is a disincentive to these students to continue their careers in investigative medicine. This situation needs to be remediated. Our institution is not currently competitive for an institutional MD/PhD training grant (i.e. Medical Scientist Training Program or MSTP grant) from NIH. We should consider MSTP funding as an aspirational goal. This will require investment and the COM should develop a short- and long-term strategy for funding of MD/PhD training. An initial short-term plan could include soliciting the state of Tennessee to support this program. The approach should emphasize the need to increase the number of physician-scientists training and remaining in the state of Tennessee. Inclusion of population health sciences and T3/T4 research as a PhD option would increase the appeal of this program to the state of Tennessee since it would leverage the statewide UTHSC network and resources for clinical research and the perceived direct benefit of clinical trials and health care implementation research to the population of Tennessee. A service payback agreement for MD/PhD training supported by the state of Tennessee could be modeled after the NIH MSTP agreement except that the service must be conducted in the state of Tennessee in order for it to be used for payback. The program should be built and billed as a statewide program in order to meet the needs and expectations of the state of Tennessee. [LCME metric: Assemble a working group to make final recommendations to COM senior leadership on whether to establish an MD/PhD program and, if recommended, the structure and implementation of such a program]

Engaging all of our faculty

The COM should help direct research faculty to opportunities where they can maximally contribute their talents and abilities to advance the COM mission. The gap is most obvious for those tenured research faculty who have not had a major extramural grant for three or more years. It is unlikely those individuals will be significantly funded again in the future and the COM must realistically adjust its expectations to offer them alternative pathways to meaningfully contribute appropriate to their skills, potential, and interests. Education is a common alternative pathway for unfunded tenured faculty. However, not all faculty have or are able to acquire satisfactory lecturing and teaching skills. Administrative service (e.g., on the IACUC or IRB) is another pathway but the numbers and time commitments of these opportunities are not sufficient to fully engage the time and expertise of the faculty. More pathways are needed so that Chairs do not resort to creating unnecessary or duplicate work, including coursework, or over-inflate the allocation of effort for administrative service or research with low-quality or low-quantity productivity. These practices are insidious and corrosive to morale and the mission. Additional pathways could include training to serve as a research administrator, either as a clinical or basic research administrator. The importance and value of this bridge to the support and conduct of research is increasingly recognized (*Nature* 295:321-322, 2021). Another option is to significantly contribute to the research program of another productive member of the faculty. There are examples of this working successfully in the COM. Not all of these pathways will

be suitable for every underdeployed faculty member, but all stakeholders, including the Chairs, must understand and agree that the energy, morale, success, and growth of the research enterprise is dependent on each and every faculty member contributing their fair share to the College and the institution.

Raising the bar

The COM research community has senior tenured faculty with limited extramural research funding. This is due, in part, to the “post-doubling” plateau of the NIH budget in the first decade of this century and its erratic growth since then. However, it is also due, at least in part, to expectations and factors within UTHSC and the COM. The COM must reset expectations for every research faculty member. One research project line is not sufficient to ensure a long-term funding trajectory. Having more than one project allows a program to more readily adapt to changing science and evolving priorities of the NIH and its study sections. A more scientifically diverse laboratory benefits from cross-pollination of ideas and expertise across projects and personnel. The COM should evaluate and explore resetting its expectations, support, and salary structure for faculty with research as a primary focus. Ideally, faculty with >50% research effort should have or be seeking at least 1.5 R01 or R01-equivalent grants. If the faculty member is only supported by one major grant, they should work together with their Chair, and possibly the SADR or colleagues, to have a plan to obtain foundation funding or other NIH funding (e.g., R21) with the eventual goal of a second major grant. Some situations may require special consideration, such as faculty in biostatistics who may not be PIs on one or two of their own grants but may be contributing to and supported by multiple grants on which they are a co-investigator, or faculty whose research is funded by federal agencies with very low pay lines (success rates) such as the National Cancer Institute. The plan should consider and prioritize collaborative opportunities within the COM and UTHSC since this can improve the research and because inter-College collaborations are eligible for CORNET funding from the Office of Research. The COM should provide, if possible, supplemental funding to support those principal investigators and laboratories whose ideas are meritorious but cannot be supported by existing (R01 or other) grant support. Performance expectations and salary and other incentives should be structured in a way to maximize research productivity and funding potential by incentivization as much as possible in order to recruit and retain our successful faculty.

SUMMARY OF OPERATIONAL GOALS

Most of the goals (see below) to ensure growth of the “S” in UTHSC do not require significant additional financial investment, if any. However, a few goals will require substantial investment. Establishment of clinical trial infrastructure at Regional One Health, trans-COM cohort recruitments of research faculty, intramural COM grants to foster and support interdisciplinary research, and a physician-scientist faculty development program (“internal K program”) are strategic priorities for investment. Modest enhancement of the quality of the MD/PhD training program may be accomplished with minimal investment, but growing the MD/PhD program into a significant pipeline of future physician-scientist faculty will require sustained investment that may not be available in the near future. An alternative to growing the MD/PhD program is to pursue institutional training grants in specific topical areas. Accomplishment of these goals will require the efforts of all members of our community: physicians, scientists, administrators, students, trainees, and the many others who make it possible for us to conduct important research that improves our lives and communities. Progress toward and completion of these goals will be assessed as part of the annual review of the entire COM strategic plan.

1. Develop and implement a consistent orientation to research administration for new faculty and principal investigators.
2. Develop a central resource that tracks the existence and location of selected research equipment and instruments.
3. Educate faculty and trainees to fully populate and leverage the Tennessee Clinical and Translational Science Institute (TN-CTSI) database of UTHSC faculty and research interests.
4. Include Chairs of COM clinical departments that include research, or their Chair-surrogates, in monthly meetings of Chairs of COM research-intensive departments.
5. Create a committee to develop and implement a plan to increase inter-disciplinary and inter-departmental interactions.
6. Develop and implement an intramural grant program to promote interdisciplinary research.
7. Establish clinical trial infrastructure at Regional One Health.
8. Develop and pilot a broad trans-COM cohort recruitment strategy for research faculty.
9. Develop and implement a transparent strategy and policy to manage COM research space in Memphis.
10. Develop and disseminate best practices for recruitment of COM faculty conducting research.
11. Develop and implement a plan for mentorship of faculty across the COM.
12. Develop and implement a plan to ensure that all COM Chairs have a strategy and plan for research in their departments.
13. Develop a centrally-supported physician (clinician)-scientist training program to develop a small number of junior physician-scientist faculty with strong potential for external research funding.
14. Develop and implement short- and long-term strategies to enhance MD/PhD dual-degree training.
15. Develop and utilize alternative career development pathways for tenured research faculty who are no longer competitive for major external research funding.
16. Evaluate and revise, as needed, expectations, support, and salary structure for faculty with research as a primary focus.

STRATEGIC PLANNING FOR RESEARCH COMMITTEE ROSTER

Chair: Andrew Griffith, Senior Associate Dean of Research, College of Medicine, Memphis

Penny Asbell, Department of Ophthalmology, College of Medicine, Memphis

Martin Croce, Department of Surgery, College of Medicine, Memphis

Alex Dopico, Department of Pharmacology, Addiction Science, and Toxicology, College of Medicine, Memphis

Matthew Ennis, Department of Anatomy and Neurobiology, College of Medicine, Memphis

Terri Finkel, Department of Pediatrics, College of Medicine, Memphis

Karen Johnson, Department of Preventive Medicine, College of Medicine, Memphis

Csaba Kovesdy, Department of Internal Medicine, College of Medicine, Memphis

Lawrence Pfeffer, Department of Pathology, College of Medicine, Memphis

Giuseppe Pizzorno, Department of Medicine, College of Medicine, Chattanooga

Donald Thomason, Department of Physiology, College of Medicine, Memphis

Jonathan Wall, Department of Medicine, Graduate School of Medicine, Knoxville

Robert Williams, Department of Genetics, Genomics, and Informatics, College of Medicine, Memphis

Process Related to the College of Medicine Strategic Plan 2020-2025

Initial Draft: In late 2019, four Strategic Planning SubCommittees with widespread College representation began work. The COM Strategic Planning Committees were: (A) Education, (B) Research, (C) Clinical, and (D) Service. There was widespread representation of constituents on the committees. Constituents were slightly different for each committee but included representation from the Dean's Faculty Advisory Council (DFAC); residents; students seeking an MD degree or PA certification; faculty with a primary effort in patient care, research, or education; COM Assistant-Associate Deans; and representation from the Chancellor's Office. Faculty representatives from each of the four campuses were included.

Initial Feedback: In early spring of 2020, due to the COVID-19 pandemic, the planning process was disrupted. However, in late 2020 a draft strategic plan was presented to the following groups to get input and suggested changes.

- Executive Dean's Cabinet: This group is composed of the Associate Deans of Clinical Affairs, Research, Faculty Affairs, Finance, GME, Diversity and Inclusion, Community Outreach, Medical Education, Student Affairs, and the Chairs of Surgery, Medicine, and Pediatrics.
- Dean's Faculty Advisory Council (DFAC): This council is composed of faculty representatives from virtually all departments across all campuses.
- Council of the COM: This council is composed of Chairs, Deans, and Associate Deans from all campuses.

Revision Phase: Recommended changes to the strategic plan were considered and the strategic plan modified and improved upon by the original strategic planning subcommittees.

Final Approval:

- The revised strategic plan was presented to all faculty for review and comment in October of 2020. Due to the extensive initial feedback process, feedback from this faculty review was uniformly positive.
- Executive Dean Strome approved the final version on Nov 15, 2020.

Monitoring and Yearly Revisions:

- In June of each year the Strategic Plan will be reviewed by the Strategic Plan Monitoring Committee. The Committee will review outcomes, and make recommendations for actions and /or revisions to the Executive Dean. The Executive Dean will consult with various groups, such as DFAC and Department Chairs. The Executive Dean has the final authority to approve a revised plan. It should be noted, should extensive revisions be required, the Executive Dean may ask the Strategic Planning Subcommittee, in a given mission, to work with the Monitoring committee.
- The COM Strategic Plan Monitoring Committee is composed of the
 - President of the DFAC and 4 faculty representatives recommended by DFAC, with a minimum of 1 representative from each campus
 - Associate Deans (or designee) of Faculty Affairs, Clinical Affairs, Research, Medical Education, Outreach, and Diversity and Inclusion.
 - Two Chairs within the College of Medicine recommended by the Council of COM

A Major Revision to the Research Strategic plan and the process used to develop that plan is outlined in this document (beginning on page 13). This plan was accepted by the Executive Dean in December of 2021.