School of Health Professions
Research Growth Plan

The School of Health Professions (SHP) was established in 1978 as a unit within the School of Medicine and became an autonomous college at MU in 2001. SHP is the only state-supported, comprehensive college of health professions in Missouri and is an integral component of MU Health. In the last four years, SHP administration and faculty members have put forth extraordinary effort that has yielded unprecedented research growth. For example, the value of grant proposal submissions has surged from $4.2 million in FY 2014 to $11.9 million in FY 2018. The amount of research funding awarded in these four years has more than doubled from $600,000 to $1.3 million. A new PhD program in Health and Rehabilitation Science is scheduled to begin in FY20 and will provide a rich opportunity to further stimulate grant-funded research projects.

1. What are your research goals in each of the following areas over the next five years?

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Expenditures*</td>
<td>$2,547,473</td>
<td>$2,929,594</td>
<td>$3,369,033</td>
<td>$3,874,387</td>
<td>$4,455,546</td>
<td>$5,123,877</td>
</tr>
<tr>
<td>Phase I Research Expenditures*</td>
<td>$1,165,390</td>
<td>$1,340,198</td>
<td>$1,541,228</td>
<td>$1,772,412</td>
<td>$2,038,274</td>
<td>$2,344,015</td>
</tr>
<tr>
<td>Phase II Research Expenditures*</td>
<td>$2,448</td>
<td>$2,815</td>
<td>$3,238</td>
<td>$3,723</td>
<td>$4,282</td>
<td>$4,924</td>
</tr>
<tr>
<td>Proposals Submitted*</td>
<td>30</td>
<td>35</td>
<td>40</td>
<td>46</td>
<td>52</td>
<td>60</td>
</tr>
<tr>
<td>Value of Proposal Submitted*</td>
<td>$12,831,539</td>
<td>$14,756,270</td>
<td>$16,969,710</td>
<td>$19,515,166</td>
<td>$22,442,441</td>
<td>$25,808,807</td>
</tr>
<tr>
<td>Highly Prestigious and Prestigious Awards**</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Other Awards **</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Publications**</td>
<td>41</td>
<td>50</td>
<td>69</td>
<td>81</td>
<td>93</td>
<td>96</td>
</tr>
<tr>
<td>Books**</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Citations**</td>
<td>343</td>
<td>418</td>
<td>577</td>
<td>680</td>
<td>781</td>
<td>806</td>
</tr>
</tbody>
</table>

*Office of Research
** Source: Academic Analytics (average annual awards, books, publications and citations on those publications (12-16)

2. Do you have any additional measurable college/school research goals (e.g. performances, conference proceedings)? Please include a description with baseline data and annual projections in a tabular format as above.

SHP utilizes the metrics above.
3. Identify 2-3 universities that would be considered “current peers,” 2-3 “proximal peers” and 1 “distal peers” for your college/school. Identify what data were used for identification of peers (e.g. rankings, Academic Analytics). A college/school may have different peer groups for areas of scholarship.

There is no universal ranking system for schools of health professions and individual program rankings are focused on clinical training and student outcome measures. However, 14 research-focused health professions colleges housed in public universities, half of which are AAU members, have formed a consortium known as the Santa Fe Group. SHP joined this group in 2012 when we began to focus on increasing research productivity. The Santa Fe Group collects metrics annually from members. These metrics include the number of grant applications and amounts awarded, and numbers of faculty members on journal editorial boards and study sections for federal agencies. We have chosen the Santa Fe Group to identify current peers, proximal peers, and distal peers, because it includes schools and colleges that are at the forefront of our professions and all of its members aspire toward research excellence.

We selected the University of North Carolina at Chapel Hill, Indiana University, and the University of Kansas Medical Center as current peers. The University of Kentucky and The Ohio State University are proximal peers. The University of Alabama-Birmingham is a distal peer. Finally, we selected University of Florida as a “galactic” peer, because we believe that with continued leadership emphasis on research productivity, development of research infrastructure, and selective hiring of research faculty, we will match our distal peer in funding and other metrics. The table below shows the number of proposals submitted and the amount of funding from federal agencies each of these schools received in FY17.

<table>
<thead>
<tr>
<th>Comparison of MU and Peers on Research Activity FY 2017</th>
<th>Awards from federal funds</th>
<th>Number of Research Doctoral Degrees Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Missouri</td>
<td>1,800,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>Current Peers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana University</td>
<td>1,500,000</td>
<td>1</td>
</tr>
<tr>
<td>University of Kansas Medical Center</td>
<td>1,300,000</td>
<td>14</td>
</tr>
<tr>
<td>University of North Carolina -- Chapel Hill</td>
<td>1,400,000</td>
<td>11</td>
</tr>
<tr>
<td><strong>Proximal Peers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohio State University</td>
<td>5,800,000</td>
<td>4</td>
</tr>
<tr>
<td>University of Kentucky</td>
<td>4,900,000</td>
<td>8</td>
</tr>
<tr>
<td><strong>Distal Peers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Alabama-Birmingham</td>
<td>7,000,000</td>
<td>18</td>
</tr>
<tr>
<td><strong>Galactic Peer</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Florida</td>
<td>34,100,000</td>
<td>41</td>
</tr>
</tbody>
</table>
4. Does your college have any official incentive programs to reward scholarly productivity (e.g. donor related programs, endowed positions)?

SHP offers the following incentives to faculty members to launch or further advance their research programs:

- **One endowed position**, the HealthSouth Professorship in Physical Therapy
- Departments and researchers **retain 90% of the RIF** that is returned to SHP
- **Small grants** to collect pilot data for external proposals
- **Facilitation funds** to meet one-time needs that foster a research program, e.g., equipment purchases, publication fees, or external reviews of federal grant proposals
- **Professional development funds** are provided to every faculty member for memberships in professional organizations, travel to scientific meetings, software, etc.
- **Course buyout incentive** allows faculty who receive 25% of their salary from grants to buy out a course each semester

SHP is developing additional supports to encourage greater scholarly productivity, including:

- **Research leave** to complete research products such as a federal grant proposal
- **Graduate research assistants** to support both faculty and SHP’s new Ph.D. program
- **Post-doctoral fellows** to facilitate research productivity in faculty nearing tenure evaluation and/or with outstanding research productivity (2 per year)
- **Mentorship fund** to pair SHP faculty with senior scientists in their fields for research career mentoring

5. Identify your strengths in research and creative works within the college/school and how those areas have contributed to the overall research productivity. Estimate hiring plans in those areas over the next 5 years.

**Strengths**

SHP’s faculty members have productive research programs that will make vital contributions to the current and proposed interdisciplinary research centers at MU. SHP’s focus on critical issues facing the health and well-being of children and adults in diverse populations are strengths that we will foster in our research growth plan. SHP’s researchers are highly interdisciplinary (see Appendix 1) and are collaborating with colleagues in nearly every School or College at MU.

Broadly speaking, our researchers across departments address two major themes in their research:

- Health Restoration and Rehabilitation
- Public Health and Health Disparities
Health Restoration and Rehabilitation
Work in Health Restoration and Rehabilitation is currently supported by NIH grants, totaling $2.7 million (SHP: PI). This research is translational and entrepreneurial because it develops new interventions and treatment devices. SHP researchers have been awarded two Coulter awards and an NIH Small Business Innovation award. Researchers in this area examine the mechanisms responsible for disorders and the interventions that are likely to be most effective.

Public Health and Health Disparities
SHP faculty are engaged in novel approaches to studying issues of societal importance. This work pinpoints health disparities and facilitates health care delivery to vulnerable populations and people with chronic diseases. Faculty research is supported by NIH funding totaling over $471,000.

Phase 1 grant funding for SHP faculty in these areas of strength is shown in Appendix 2.

Five-year Hiring Plan
A recent series of transitions for individual faculty members (e.g., retirement, relocation for family reasons) has combined for the loss of 9 faculty in the last 2 years including 3 Professors and 3 Associate Professors. We currently have 20 T/TT faculty, consisting of 10 Assistant Professors, 9 Associate Professors (4 of whom received tenure in the last two years), and 1 Professor. Given that SHP is composed of a relatively small and early career faculty, the loss of almost 1/3 of the faculty has negatively affected productivity more than it might for larger units. Thus, it is imperative that we target outstanding early and more advanced researchers who will contribute to our strengths and serve as catalysts for new grant-funded projects.

FY19:
Health Restoration and Rehabilitation
Nicholas Smith, Ph.D., Assistant Professor with expertise in the role of mother-infant interaction in the development of communication skills in young children, Department Communication Science and Disorders, funded by SHP

Public Health and Health Disparities
Adrienne Frech, Ph.D. Associate Professor with expertise in the effects of gender, work, and marriage on health, Department of Health Sciences, funded by SHP

FY20:
Health Restoration and Rehabilitation
Assistant Professor with expertise in brain injury, Department of Health Psychology, funded by SHP
Associate Professor with expertise in community health psychology, Department of Health Psychology, funded by SHP

Assistant Professor with expertise in phonology or child language, Department of Communication Science and Disorders, funded by SHP

Public Health and Health Disparities

Professor, joint appointment with College of Veterinary Medicine and the Master of Public Health program, funded by CVM, SHP and request for MU support

Open Rank Search, expertise in Social Determinants of Health, Department of Health Sciences, funded by SHP

Assistant Professor with expertise in social, economic, or educational factors leading to health disparities, Department of Health Sciences, diversity hire, funded by FIEF and SHP

FY 21:
Health Restoration and Rehabilitation

Assistant Professor with expertise in early childhood intervention, Department of Occupational Therapy, funded by SHP

Public Health and Health Disparities

Associate or Full Professor with expertise in addiction policy, Master of Public Health program, joint hire with Psychological Sciences and/or the Truman School of Public Affairs. Will request support from MU.

Associate or Full Professor with expertise in epidemiology/demography (using large data sets) and health services research, Appointment in the Department of Health Sciences. Will request matching support from MU.

Assistant Professor with expertise in behavioral and community health sciences, Department of Health Sciences, diversity hire, funded by FIEF and SHP

FY22:
Health Restoration and Rehabilitation

Assistant Professor with expertise in stroke, Department of Occupational Therapy, funded by SHP
**Public Health and Health Disparities**

Associate or Full Professor with expertise in epidemiology and/or health services research, Appointment in Public Health program. Will request support from MU.

**FY23:**

*Health Restoration and Rehabilitation*

Associate or Full Professor with expertise in kinesiology, Appointment in Physical Therapy or Occupational Therapy. Will request support from MU.

6. **Identify your emerging strengths where there is specific potential for growth.** Provide data on current faculty and research production in these areas (e.g. recent significant grant funding, cluster of high profile scholarly activities).

   - **Public Health:** health care outcomes; improving “participation” (WHO definition) among persons with chronic disease; health care delivery; substance abuse prevention and control

   - **Speech and Communication:** creating new instruments for treating voice and motor speech disorders; innovative interdisciplinary models of speech and language in children and adults

   - **Health Disparities:** impact of social inequalities and life course events on health disparities

   - **Musculoskeletal Biomechanics and Kinesiology:** specifying principles of knee biomechanics and soft tissue function that affect gait and stress on knee cartilage

   - **Cognitive functioning:** designing interventions to address cognitive impairments following cancer treatment, stroke, and other disorders

   - **Chronic Pain:** mapping the biopsychosocial factors that influence the development and maintenance of chronic pain

These areas of strength were identified based on faculty productivity as evidenced by grant funding, publications, ranking on Academic Analytics, and on potential for interdisciplinary collaboration. A listing of productivity metrics is provided in Appendix 3.

7. **Based on your college/school strengths, what do you see as current or potential interdisciplinary collaborations that could lead to significant research advancement?**

8. **What emerging areas of research opportunities are you aware of in fields related to college/school strengths? What are your current plans related to those opportunities?**

This answer will address both questions 7 and 8. SHP has been developing substantive research collaborations. Appendix 1 shows current collaborations between SHP researchers and other units on campus. Our current grant-funded research is highly compatible with the following units and proposed centers on campus:
• **Social and Behavioral Science Research Center:** particular strengths in “big data” approaches to health disparities and behavioral studies of psycho-social-biological mechanisms underlying disorders and chronic pain

• **Missouri Orthopedic Institute:** particular strengths in use of experimental and computational methods to construct replacements joints

• **Addiction Research:** particular strengths in cigarette/e-cigarette and marijuana use prevention among children and adolescents

• **Center for One Health Solutions:** particular strengths in global and public health

• **Department of Public Health:** The School of Health Professions and the College of Veterinary Medicine are proposing to transition the Master of Public Health Program to a Department of Public Health. This department will be jointly managed and the program will remain interdisciplinary with joint faculty appointments with other units. Creating a Department of Public Health will allow for tenure-track faculty hiring and provide clearer accountability and direction for this unit. Public health research is burgeoning and the opportunity for MU to be a strong player is enormous.

• **MU Health Sciences and TPMC:** particular strengths in public health and individual differences in prevention of disorders and improved management of disease

• Interdisciplinary work with the **College of Engineering:** particular strengths in developing devices for assessment and intervention of disorders

In addition, we are active with the faculty of several existing centers on campus including the Thompson Center for Autism and Neurodevelopmental Disorders; the Population, Education and Health Center; and the Brain Imaging Center.

The creation of new interdisciplinary centers, such as the Social and Behavioral Sciences Center, provides an infrastructure that offers SHP’s researchers new opportunities for productive collaborations that contribute to MU’s strategic vision for scholarly excellence. Institutional support for interdisciplinary research will multiply the rate of research productivity, including AAU-qualifying grant funding, citations, and awards.

In response to the renewed support for interdisciplinary collaboration, SHP is focused on increasing the number of external research proposals and publications in high-impact journals in our fields. An increase in citations will result from targeting high impact journals. We will have current NRC/AAU Highly Prestigious and Prestigious award recipients (K. Hagglund, S. Reid-Arndt, E. Schatz) mentor high-performing faculty to become viable candidates for these awards.
We will launch our school-wide Ph.D. in Health and Rehabilitation Science in FY20. This new program and the hiring of well-funded research faculty expand our opportunities for grants tremendously. Among these will be a T32 training grant to support pre- and post-doctoral trainees in Health and Rehabilitation Science. We expect to partner with Psychological Sciences, the Truman School, the School of Medicine, and Veterinary Medicine to offer comprehensive doctoral coursework, research mentorship, faculty hires, and grant proposals.

9. **Attached are the current scholars in your college/school who are in the top 100 of a) books, b) articles, c) citations and d) research awards. What are the current college strategies to support their work and position them as leaders in the college and university?**

While SHP does not currently have any scholars in the top 100 on these metrics, our early career faculty are rapidly establishing themselves in their fields. Just in the previous year, we have witnessed over 80% of our faculty move up a quintile in Academic Analytics data. We expect to have faculty at the level of the top 100 in the next 5 years.

10. **Identify emerging scholars (e.g. faculty in the 1st or 2nd quintile in their field as compared to AAU Public peers (attached), faculty with a recent first federal grant as PI or other similar scholarly achievement) in your college/school. What are the strategies currently to support their work?**

SHP is a relatively young school with a high proportion of early-career faculty and only one full professor who is not a Dean or a Center Director. Of our 20 faculty, SHP has 2 scholars in the 1st quintile in their fields and 6 in the 2nd quintile. In addition, 6 assistant professors are in the 3rd quintile, and we are confident that they will move up in the next year or two. Half of those currently in the 3rd quintile have recently been awarded their first federal grants as PIs, and another has a scored proposal with concrete plans for resubmission.

We are working diligently to support these faculty members’ research development by setting up the following support structure and systems:

- **An administrative support team** to assist with grantsmanship and scholarly writing. The team includes a grant manager, a grant writer, and dedicated biostatistics support.
- **A mentoring program** for junior faculty that we will further develop for associate professors this year.
- **Small grant program** (up to $6,000) to collect pilot data.
- **Financial support** for modest research needs (e.g., a piece of equipment; publication fees) if a faculty member does not have RIF funds or departmental support.
- **Competitive research leave** tied to a specific research product, such as a federal grant proposal.
• Graduate Research Assistants (GRAs) and Post-Doctoral Fellows for productive faculty.

11. Which of the university research strategies might there be a specific college/school related version or action(s) (with dedicated college support)? List each and briefly outline the college/school specific strategy or action(s).

Most of the existing and proposed centers deal with issues of health or well-being, including the Social and Behavioral Sciences Center, an Addiction Center, Missouri Orthopedic Institute, the Center for One Health Solutions, Genomics Reproduction and Health Innovations. All of these would be enhanced by research in public health, health psychology, and rehabilitation science.

Our researchers are poised to take part in Center initiatives, especially the Social and Behavioral Sciences Center, an Addiction Center, the Center for One Health Solutions and our partnership with MU Health and MOI. SHP is strongly supportive of tangible central support to strengthen social and behavioral science research and scholarship, as outlined in Section 7.5.4 of the report on “Scholarly Excellence.” Specifically, it is imperative that the MU strategic plan include financial support in two key areas: (1) Funding to support Schools and Colleges to hire additional accomplished SBS researchers at all ranks. The financial support should provide assistance for faculty members’ salary and research program start-up, and (2) Funding for infrastructure to strengthen SBS through the establishment and strengthening of centers and institutes that promote interdisciplinary collaboration, provide centralized support services in statistics, computation, data storage and field-based intervention, and serve as training and skills-building venues.

SHP strongly supports other university research strategies. This is an abbreviated list of actions SHP has taken to establish dedicated research support:

1. SHP has adopted a data-driven culture to mirror that of MU. The Dean’s Office maintains metrics (number of publications, number of citations, number and amount of internal and external proposals submitted, number and amount of awards). We will use them to implement and assess growth plans.

2. Tenure/Tenure Track Strategic Hiring will be critical to meeting our research goals. Our plan calls for the hiring of 11 faculty over 5 years and seeks partial campus support for 5 of these. Some are joint hires with other units. All will contribute to campus initiatives that enhance research growth.

3. One of MU’s research strategies is to strengthen interdisciplinary research-focused graduate education. SHP’s new PhD program in Health and Rehabilitation Science will support this vision.

4. Our researchers will take part in Mizzou Innovates where appropriate. We have found through our success in the Coulter Translational Partnership Program that bringing disciplines together to solve pressing health care needs results in
exciting state-of-the-art products! Further, our Coulter projects are providing pilot data for larger, federal proposals.

5. We will identify faculty who are excellent candidates for NRC/AAU prestigious and highly prestigious awards and mentor them to participate in activities to make them strong contenders.

12. Do you have any college/school specific research strategies? List each and briefly outline the college/school specific strategy or action(s).

SHP is working to increase productivity with respect to AAU metrics of numbers of publications and citations, number of proposals submitted, and amount of research expenditures. Our research strategies have been detailed throughout this document, but we summarize them very briefly here.

1. We must hire mid-career/senior faculty members with active and funded research programs who will foster interdisciplinary research in our areas of strength.

2. We will hire early-career faculty members who have demonstrated success in establishing independent, productive programs of research. The Dean’s Office will be involved in evaluating the qualifications of finalist candidates for positions and in negotiating offers to candidates.

3. We will actively pursue participation in interdisciplinary initiatives such as the Social and Behavioral Science Center, the Addiction Center, and the Translational Precision Medicine Center in addition to our well-established collaborations with the Thompson Center, the College of Engineering, the School of Medicine, and others.

4. We will continue to provide, and potentially expand, the supporting infrastructure to facilitate grant proposal submission (as described above).

5. Given the lack of a national research ranking system for schools of health professions, we will enhance our comprehensive marketing and public relations campaign to advance our national research reputation.
Appendix 1. Collaborations between SHP and other schools and colleges at MU
Appendix 2: Faculty with Phase I Awards, grants under review, or October, 2018 submissions

Health Restoration and Rehabilitation
Department of Physical Therapy
Jason Craggs, Assistant Professor, NIH R01 (PI), $1,632,170
NIH R01 (Co-I) $3,755,227

Trent Guess, Associate Professor, DoD (Co-I), $5,242 (SHP Share)

Department of Communication Science and Disorders
Maria Dietrich, Assistant Professor, NIH R15 (PI), $321,553
NIH R01 (PI) to be submitted October, 2018

Mili Kuruvilla-Dugdale, Assistant Professor, NIH R15 (PI), $427,189

Roxana Botezatu, Assistant Professor, NIH R03 (PI), under review

Department of Occupational Therapy
Timothy Wolf, Associate Professor, NIH R44 (PI), $312,430
NIH R03 (PI) to be submitted October, 2018

Rachel Proffitt, Assistant Professor, NIH R03 (PI) to be submitted October, 2018

Public Health and Health Disparities
Department of Communication Science and Disorders
Elizabeth Kelley, Assistant Professor, IES (PI), $239,099

Department of Health Psychology
Laura Schopp, Professor, NIH R01 under review

Department of Health Sciences
Hye-Jong Choi, Assistant Professor, NIH R43-STTR (PI), $64,992

Adrianne Frech, Associate Professor, NIH R03 (PI), $167,000 (new faculty member – grant to be transferred from previous institution)

Michelle Teti, Associate Professor, NIH R21 (Co-I), under review
Appendix 3: Productivity in Areas of Emerging Strengths

The areas we have identified, Public Health, Speech and Communication, Health Disparities, Musculoskeletal Biomechanics and Kinesiology, and Cognitive Function are inherently interdisciplinary and, therefore, have overlapping membership among our faculty.

Funding:
• 23 federal grant proposals submitted by 12 faculty members in these areas in FY18
• 7 faculty members are PIs of NIH funding in these areas
• Additional funding received from foundations, the UM Spinal Cord Injury/Disease Research Program, and University of Missouri Coulter Translational Partnership
• 5 additional faculty members received funding from campus or SHP to collect pilot data in these areas suggesting strong likelihood for growth and interdisciplinary collaboration in the next 5 years

Academic Analytics
• 1 faculty member in 1st quintile; 6 in second quintile
• SHP faculty are largely early career and are rapidly establishing themselves in the field. In the last year, 80% have moved up a quintile in Academic Analytics analyses.
• Most faculty members are above average on articles per faculty, citations per faculty, and citations per publication

Campus Metrics
• 2 faculty members in are in the 2nd 100 of MU faculty by papers published. We anticipate several additional faculty climbing into the Top 100 and 101-200 within the 5 years of the research plan.

Interdisciplinary and Center Potential
• These faculty currently conduct research with colleagues in the Arts and Science, College of Education, College of Engineering, School of Medicine, Social Work, the Population, Education and Health Center, the Thompson Center, and the School of Veterinary Medicine.