

## **PROPOSAL TO ESTABLISH THE ARKANSAS INTEGRATIVE METABOLIC RESEARCH CENTER (AIMRC)**

### **Name of the College, School, Department, or Unit in which the Center will be hosted.**

While the Administrative Core of the Arkansas Integrative Metabolic Research Center (AIMRC) will have a primary home in the College of Engineering, the span of the AIMRC is campus wide. The AIMRC currently includes members from the College of Engineering, the Fulbright College of Arts and Sciences, and the College of Education and Health Professions, while research core directors currently span The College of Engineering and Fulbright College of Arts and Sciences. As a result of a multi-college impact, the Center Director will report to the Vice Chancellor for Research and Innovation in the Division of Research and Innovation. Initial housing of AIMRC core facilities is expected to include the NANO and ENRC buildings, however the Center or some of its facilities may eventually be housed in the I<sup>3</sup>R Building if the Center is integrated within the Institute.

### **Name and title of the person(s) proposing creation of the Center.**

Dr. Kyle Quinn will be the Center Director. He is an Associate Professor in the Department of Biomedical Engineering, and PI of the NIH award to establish the AIMRC.

### **The Center type (research, service, or instructional) that is requested.**

The AIMRC is a research center focused on understanding the role of cell and tissue metabolism in disease, development, and repair through research involving advanced imaging, bioenergetics, and data science.

### **The unique value of the program to the University, and the distinction to any similar programs in Arkansas.**

The mission of the AIMRC is to promote and expand cross-disciplinary biomedical research in metabolism. To this end, the five-year goal is to increase Center membership and execute a faculty development and mentoring plan aimed at growing a critical mass of independent researchers with federal funding in metabolic research on the University of Arkansas (U of A) campus.

The AIMRC will provide support to the U of A community in three areas: 1) Faculty mentoring and support for boosted career development and increased federal funding success; 2) Provision of funding to grow research programs and support high-quality faculty recruitment at the U of A; and, 3) Development of three research cores (Bioenergetics, Imaging and Spectroscopy and Data Science) offering access to state-of-the-art metabolic flux analysis, imaging, and data science methods and technology in support of the research community on campus, within the State of Arkansas and beyond. This combined impact of faculty mentorship, research project support, access to cutting edge research core facilities, and increased funding success is anticipated to result in the development and translation of new diagnostic tools and therapies that will improve lives in Arkansas and the nation.

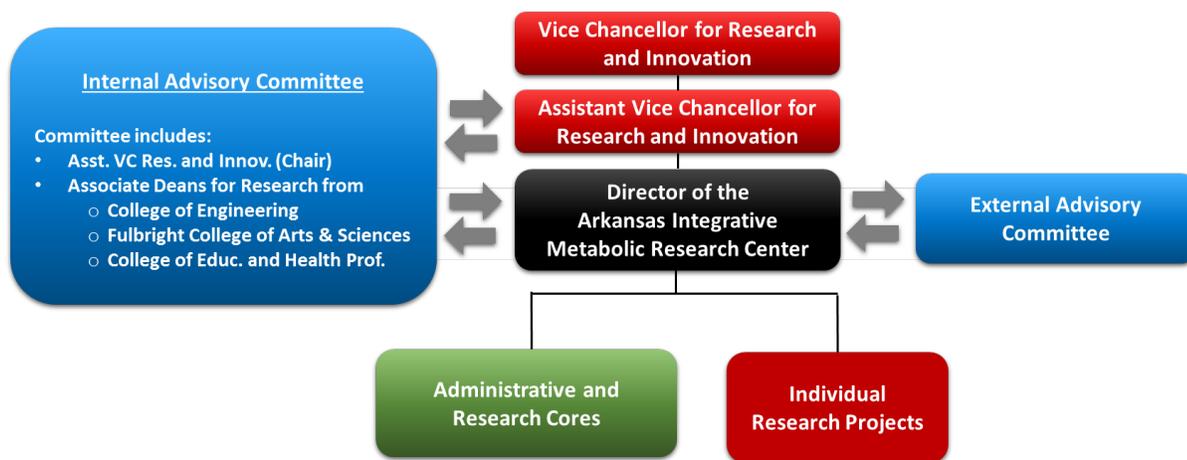
### **Information on the Director position and the organizational structure.**

The AIMRC Director, Dr. Kyle Quinn, is a tenured Associate Professor of Biomedical Engineering, and serves as the Director of the Confocal and Multiphoton Fluorescence Lifetime Microscopy Service Centers at the University of Arkansas. Dr. Quinn has been continuously funded as PI by the NIH for his entire career at the U of A and is currently the PI of two active NIH Research Project Grants (R01). He

led an interdisciplinary team of researchers in the submission of an NIH P20 Center of Biomedical Research Excellence grant, which was funded in April 2021 to establish the AIMRC. Given that he is PI of the NIH grant to establish the AIMRC, Dr. Quinn will serve as Director of the AIMRC as described in that federal grant.

The AIMRC is a thematic, interdisciplinary Center that brings together faculty from 8 departments across 5 colleges and 2 institutions to study a range of biomedical applications involving metabolism. As the center grows, this initial participation across 8 departments is expected to change and broaden. The AIMRC organizational structure consists of an administrative core, and three research cores (the Bioenergetics Core, the Imaging and Spectroscopy Core, and the Data Science Core – each having its own Core Director(s) and technical staff). The AIMRC will initially support four research projects led by junior investigator Project Leaders. The Director, through the *Administrative Core*, will coordinate Center activities, oversee the recruitment and mentoring of Project Leaders, provide oversight to ensure effective operation of the Cores, and communicate with advisory committees.

The institutional organizational structure of AIMRC is as follows:



Oversight of daily center operations will be managed by the Director with support from a *Senior Mentoring Committee* and Program Manager. The Senior Mentoring Committee consists of three well-established full professors with experience leading research centers. Given the cross-college organization of the AIMRC, the Director of the AIMRC will report to the Vice-Chancellor in the Division of Research & Innovation (or designee), who will provide institutional oversight (fiscal and operational). Per NIH and state guidelines, internal and external advisory committees will also be established to provide guidance and independent oversight. The internal advisory board will consist of administrators from DRI, and deans or associate deans from the relevant colleges. Board membership may also be altered based discussions about Center needs and priorities between the Center Director and Chair of the Internal Advisory Committee.

**Identification of faculty (or qualifications of type of faculty), other personnel, and academic units that will be involved with the Center.**

The NIH COBRE Notice of Award, which is the initial funding source used to establish the Center lists the four initial research project leaders and the Center Director (PI) as Key Personnel. These Key Personnel have specific NIH reporting requirements and required federal effort as described in the

Notice of Award and Funding Opportunity Announcement. Other significant contributors receiving funding through the grant include the Core Directors and project mentors.

**Project Leaders:** The AIMRC will initially have four active research projects with junior faculty serving as Project Leaders. As Project Leaders secure independent external funding, they will remain Center members but graduate from the faculty mentorship program. At that time, they will be replaced with a new Project Leader. We will establish a pipeline of faculty that can serve as a new project leader through (1) faculty recruitment efforts, (2) identification of existing junior faculty whose research focus is aligned with the Center, and (3) a Pilot Project Program to establish new research directions aligned with the Center goals (with total funding of up to \$100k per year).

**Core Directors:** Core Directors are selected based on relevant scientific and project management acumen. Core Directors may change over time as the Center needs evolve, and the leadership of each core may range from a single director, co-directors with specific responsibilities, or a director supported by an associate, assistant, or deputy director. Changes to the leadership of any core will be made by the Center Director based on feedback from the Vice Chancellor for Research and Innovation and/or consultation with the Senior Mentoring Committee, Internal Advisory Committee and External Advisory Committee.

**Student involvement, if any.**

Initially, four junior faculty Project Leaders, as well as Pilot Project awardees, will provide opportunities for undergraduate and graduate students to be involved in research conducted within the Center. Students conducting research in Center member labs will be encouraged to present their work at annual symposiums hosted by the Center. Additionally, there will be a seminar series and journal club that students will be encouraged to attend and will have opportunity to participate in critical analysis of peer-reviewed articles and make presentations.

**Annual budget for the Unit or the estimated expenditures per year.**

The annual budget for the AIMRC will be based on the NIH COBRE grant budget with estimated expenditures is as follows:

Budget	Year 1	Year 2	Year 3	Year 4	Year 5
Salaries and Wages	\$724,294	\$749,296	\$749,296	\$749,296	\$749,296
Fringe Benefits	\$158,930	\$165,748	\$165,748	\$165,748	\$165,748
Personnel Costs (Subtotal)	\$883,224	\$915,044	\$915,044	\$915,044	\$915,044
Materials & Supplies	\$140,752	\$89,387	\$65,735	\$40,717	\$28,100
Travel	\$24,000	\$25,000	\$28,000	\$28,000	\$22,000
Other	\$268,892	\$263,892	\$262,392	\$262,392	\$256,892
Subawards/Consortium/Contractual Costs	\$260,641	\$260,681	\$263,281	\$268,481	\$268,481
Publication Costs	\$5,500	\$7,500	\$7,500	\$7,500	\$5,500
TOTAL FEDERAL DC	\$1,583,009	\$1,561,504	\$1,541,952	\$1,522,134	\$1,496,017
TOTAL FEDERAL F&A	\$680,141	\$644,368	\$633,292	\$620,783	\$607,725
TOTAL COST	\$2,263,150	\$2,205,872	\$2,175,244	\$2,142,917	\$2,103,742

**Estimated fiscal resources and potential sources of funding (e.g., state, private, endowment, grant, contract, or other).**

While initial AIMRC funding will be provided by the NIH P20 COBRE award and the associated obligated funds listed above, Center Phase I efforts are geared toward expanding Center resources and

membership, which is expected to result in funding streams that will sustain the Center as an entity beyond P20 funding. Additional funds will be generated via three primary avenues:

1. **Core Fees:** As research cores become more established, we will engage in active marketing of core services through the Center website, seminars, sharing of information at campus and regional conferences (e.g., INBRE and IDeA program meetings), and advertising of core services to other INBRE and COBRE centers. Fee-for-use access to equipment coupled with an ever-broadening user base is expected to contribute to sustainability. Ongoing service contracts on essential equipment will also be sustained through fee-for-use charges as determined jointly by the AIMRC Core Directors and the OSP accounting office. Financial analysis of existing cores reveals that this model is self-sustaining. Additionally, Center services can be expanded in future years to accommodate industrial sponsors.
2. **Research Incentive Funds (RIF):** As Center membership increases, and as members increase their federal and non-federal award success through proactive AIMRC mentorship, grantsmanship, and post-award support, the AIMRC will receive 20% of the indirect costs from grants submitted by members that use Center resources.
3. **IP Income:** Any associated intellectual property (IP) arising from center support and activity will provide additional revenue streams.

In addition to the revenue streams generated above, after five years of NIH Phase I funding described previously, the AIMRC will apply for multiple renewals spanning 10 additional years of funding at similar levels (Phase II and III COBRE).

### **Space and equipment needs of the Center and a description of how they will be met.**

New equipment required to establish the AIMRC will be paid for with award funds or through existing commitments by the Division of Research and Innovation and/or Dean's Offices. The existing imaging and spectroscopy equipment dedicated to the AIMRC currently occupies roughly 4,500 SF in the Engineering Research Center (ENRC) in south Fayetteville, AR. An additional multiphoton microscope to be purchased in early 2022 will be housed in a 160 SF room that is part of a 2,700 SF AIMRC lab space shared with the Bioenergetics Core, located in the Institute for Nanoscience and Engineering (NANO) Building. The Data Science Core currently exists in a 1,000 SF lab in the Computer Science department. The Data Science Core's computational resources are accessible remotely through the Arkansas High Performance Computing Center portal.

As a significant step towards promoting collaborative research on campus, the U of A recently secured a significant grant from the Walton Family Charitable Support Foundation to establish the Institute for Integrative and Innovative Research (**I<sup>3</sup>R**), which will house five research centers of excellence, two of which solidly align with the strengths of the AIMRC - *Bioscience & Bioengineering Research in Metabolism*, and Data Science. It is anticipated that AIMRC resources will have the opportunity to move into the new I<sup>3</sup>R building, which will be located adjacent to the NANO building.

### **Description of administrative control and lines of authority for the Center.**

The Center Director will oversee all aspects of the AIMRC and will ultimately be responsible for all decisions pertaining to daily operation. Since the AIMRC brings together faculty from 8 departments across 5 colleges and 2 institutions, ultimate authority for the AIMRC rests with the Vice Chancellor for Research and Innovation (VCRI) in the Division of Research and Innovation (DRI). The Center Director will report to the VCRI or a designee within DRI.

**Description of the advisory board including its size, the method of its selection, and length of terms.**

The Administrative Core will ensure proper allocation of resources and evaluation of Center activities by working with both an External Advisory Committee (EAC) and an Internal Advisory Committee (IAC). The (EAC) will consist of five nationally/internationally recognized individuals in the areas of research within the Center. The primary role of the EAC will be faculty development and mentorship, evaluating research projects and project leaders toward graduation, and evaluating overall Center development and progress. Members of the EAC will be selected by joint consultation between the Director, the Senior Mentoring Committee and other stakeholders. EAC terms are expected to span the full duration of Phase I funding (5 years).

IAC representatives will span critical administrative levels including the Division of Research and Innovation as well as relevant deans or designees. The role of the IAC will be to maintain a dialog with institutional leaders to ensure support critical for long-term success, as well as engage in faculty recruitment, infrastructure development, and securing institutional commitment for future project leaders. Given that new faculty are expected to be recruited to the AIMRC on a regular basis as the center grows, IAC membership will be re-evaluated annually to ensure that faculty within the center are appropriately supported and represented on the committee.

**The metrics to be used to evaluate the Center's feasibility at its five-year review.**

The overall effectiveness of the Center will be evaluated using quantitative metrics. Milestones for evaluation include formation of a multi-disciplinary thematic COBRE program, submission of R01s by all Project Leaders by the end of Year 2, graduation of initial Project Leaders by Year 3, replacement of graduated Project Leaders,  $\geq 6$  major federal awards from Project Leaders or other junior faculty within the center during Phase I, completion of mentoring meetings, recruitment of 5 junior faculty during Phase I, awarding of 2 Pilot Projects each year, and  $\geq 20$  manuscripts per year from Center members.

Evaluations will be communicated to the IAC, EAC, and NIGMS.