

Research Development Fund – 2020-2021 Application Template  
SUBMISSION DEADLINE EXTENDED: **Monday – October 19, 2020 at 12 noon CDT** to [rdf@tamu.edu](mailto:rdf@tamu.edu)

**\*\*Applications that exceed page limits for any section or do not follow template will not be reviewed\*\***

**Application Title: Acquisition of a unique variable field, cryogen free MR system and hyperpolarizer**

**Lead contact for RDF Application:**

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**Key Participating Units:**

College of Medicine: EnMed and Depts. of Molecular and Cellular Med., and Neuroscience  
College of Veterinary Medicine and Biomedical Sciences: Depts. of Radiology and Int. Biosciences, TIPS  
College of Engineering: Depts. of Electrical and Computer, Biomedical, and Mechanical Engineering  
College of Education and Human Development: Human Clinical Research Facility  
College of Science: Depts. of Chemistry, Mathematics, and Biology  
College of Agriculture and Life Sciences: Department of Biochemistry & Biophysics  
TAMU-Qatar: College of Science

**Anticipated Request Amount (\$): \$1,973,200**

**Executive summary of this application to utilize Research Development Funds:**

We are proposing the acquisition of a new technology MRI/MRS scanner and a hyperpolarizer that will greatly extend the capabilities for MRI and MRS on campus. Texas A&M is well-served by 3T clinical scanners but has no capabilities at higher fields or lower fields. Higher fields are needed for high resolution, high sensitivity studies needed to investigate such applications as traumatic brain injury, functional MRI in animals, and in-vivo metabolomics. The scanner, the first “medium bore” variable field scanner in the world that will operate up to 7T, will also allow variable field studies, down to tens of milliTesla. This is important for point-of-care technologies and MRI/MRS in underserved populations, as well as for natural resource and plant/nutrition studies, where high field MRI is impractical in the field. The unique scanner can swing between a horizontal and vertical bore, to accommodate studies such as fluid transport or awake fMRI studies in animals. The hyperpolarizer will enable a wide array of emerging research techniques not previously available on any scanner at TAMU. These include the development and application of cutting-edge molecular probe for selective detection of disease biomarkers. Hyperpolarization enables targeting of specific markers or metabolic pathways, acquiring images with increased contrast, sensitivity, and selectivity.

The scanner is being proposed by researchers in six colleges and AgriLIFE, with an advisory board consisting of the directors or key members of other MRI facilities on campus. This synergistic approach is possible because the proposed facility fills a need not provided by the existing MRI scanners, and also promises to enhance the services provided by these existing, clinically focused facilities by providing expertise, training and support in pulse sequence and image reconstruction and RF coil support, critical for the continued technical viability of any MR center.

The cryogen free technology, which also allows the variable field strength feature, promises lower operating costs and higher reliability. The manufacturer will extend the full maintenance agreement from one year to three years at no cost, to ensure zero maintenance costs for three years.

To ensure widespread availability, the investigators will obtain BSL-2 certification by the usual permitting process routed through the IBC. Additionally, we are working with Robert Rose of the LARR to enable short to medium storage of animals when return to the colony is not possible, enabling longitudinal animal studies.