

## PROJECT SUMMARY

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### **Overview:**

Our I-Corps L team is proposing a professional development model to transform middle school science teaching and learning. Our nation's middle grades science teachers, the portal to science engagement and success in high school and beyond, are overwhelmingly under prepared to meet certification requirements and public expectations for student performance in science. Close to 60% completed a college degree in a field other than science or science education (Weiss, 2013). A transformative, classroom-focused, field-tested professional learning program is needed to simultaneously bolster middle grades science teachers' disciplinary content knowledge and pedagogical skills. Our I-Corps team is organized and positioned to respond to this pressing national need for stronger middle grades science teachers. In our current plan to scale up our transformative professional development model, we intend to use reform-based curricular practices as the driver for the professional learning and preparation of middle school science teachers as Science Teacher Leaders (STL). Our innovative professional development model includes attention to science content and science specific pedagogical practices including the development of teachers' capacities to meet the demands of diverse learners. Furthermore, as states continue to adopt the Next Generation of Science Standards, the demand for seamless, accessible professional learning opportunities for their middle grades science teachers will increase. Guided by lessons learned and our research findings, we propose to adapt our current U-FUTuRES' professional learning/course curriculums to meet the needs for intensive and content area specific professional learning.

### **Intellectual Merit :**

Intellectual Merit: The intellectual merits of this project include the contributions we will make to the knowledge base about job-embedded support and professional learning opportunities offered directly to science teachers as we complete stakeholder interviews and consultations as a consequence of our participation in the I-Corps L training program. U-FUTuRES 2.0 focuses on professional growth and enrichment of both disciplinary content knowledge and pedagogical skills. The successful development of a model to increase science teachers' professional learning at scale will also support the development of a community of science teachers focused on continuous improvement of practice to increase students' science achievement, and improve access for groups typically underrepresented in STEM. Furthermore, the composition of our team overlaps with the goal of NSF to prepare graduate student/potential faculty with new capabilities and expertise including innovation and entrepreneurship.

### **Broader Impacts :**

Broader Impacts: Our involvement in I-Corps L and the refining of our innovative science teacher professional development model will result in a curricular program that will transform science teaching and learning in the middle grades consistent with current reform efforts in science education. By building a highly effective professional development system for middle grades science teachers, we will directly address science achievement in high schools and strengthen the development of a strong STEM workforce for the coming decades. We envision that our model of professional learning will strengthen and redefine the career trajectory of hundreds of exemplary science teachers and improve outcomes for thousands of students. As STLs, they will serve as agents of change from their classrooms, leading and advocating for improved middle grades science teaching and learning which will result in an expanding web of science teachers dedicated to their own professional growth. In addition, our product will be cost-effective and made readily available to schools and districts as well as national and international educational entities seeking to transform middle grades science teaching and learning.