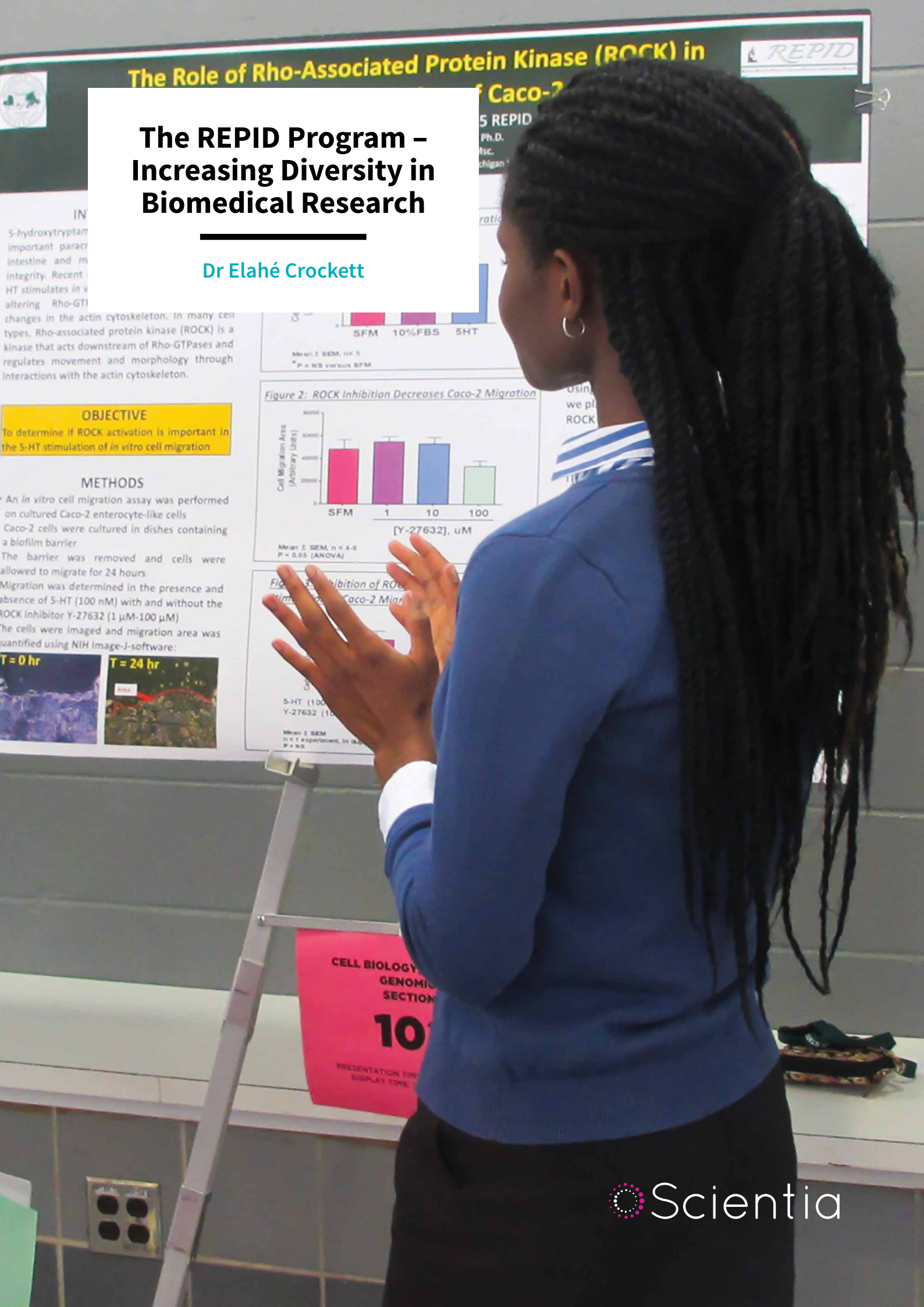
# The REPID Program – Increasing Diversity in Biomedical Research

Dr Elahé Crockett




Scientia

# THE REPID PROGRAM – INCREASING DIVERSITY IN BIOMEDICAL RESEARCH

**Dr Elahé Crockett** and colleagues at Michigan State University have developed the Research Education Program to Increase Diversity in health researchers (REPID) program to train students from underrepresented, minority and disadvantaged backgrounds in the basic and advanced biomedical sciences. The goal of the program is to overcome the lack of diversity in biomedical research and clinical practice.

**Minority Representation in Biomedical Research**

There is a startling difference in the proportion of underrepresented groups in the healthcare industry. Several ethnic groups, specifically African Americans, Hispanics, Native Americans, and Hawaiian/Pacific Islanders and socioeconomically disadvantaged individuals, such as women and people with a disability, are repeatedly underrepresented in biomedical and clinical research and clinical practice.

Although there is a clear need for a diverse taskforce in biomedical science, the current scenario represents one of a homogeneous group and this lack of diversity is particularly apparent in postgraduate education. The number of doctoral degrees awarded to underrepresented students in the US is significantly less than the number of bachelor's degrees.

This disparity continues along the academic ladder – the National Institutes of Health (NIH) estimated in 2012 that only 5% of principal investigators who received grants in 2010 belonged to underrepresented groups. In order to create a diverse healthcare workforce that is culturally inclusive, it is imperative to encourage and train a diverse student population in basic and clinical research.

**A Grassroots Program to Improve Diversity in Biomedical Research**

Dr Elahe Crockett, the project director of the Research Education Program to Increase Diversity in health researchers (REPID) at Michigan State University (MSU), is dedicated to addressing this problem.

Since 2011, Dr Crockett has been working with a team of highly qualified faculty at MSU that has successfully mentored and trained over 100 students from underrepresented, minority and disadvantaged backgrounds in basic and advanced biomedical science disciplines, with the goal of overcoming the lack of diversity in biomedical research. The REPID program aims to provide comprehensive research training and enrichment experiences for students from underrepresented groups to inspire them to pursue careers in health-related research.

The REPID program includes an introductory course in biomedical research basics and a summer research project that provides hands-on

research experience to REPID scholars in a biomedical science laboratory or clinic. The program is specifically designed to focus on the dissemination of information on basic science and translational and clinical research in biomedical science, especially in cardiovascular, pulmonary, and haematologic disease research.

Through regular seminars and the use of the excellent educational resources available at MSU, the program teaches concepts that are common to all biomedical research disciplines such as integrity, literature review, critical thinking, experimental design, research laboratory skills, data collection and analysis, and modes of scientific reporting such as manuscript preparation and effective oral and poster presentations.

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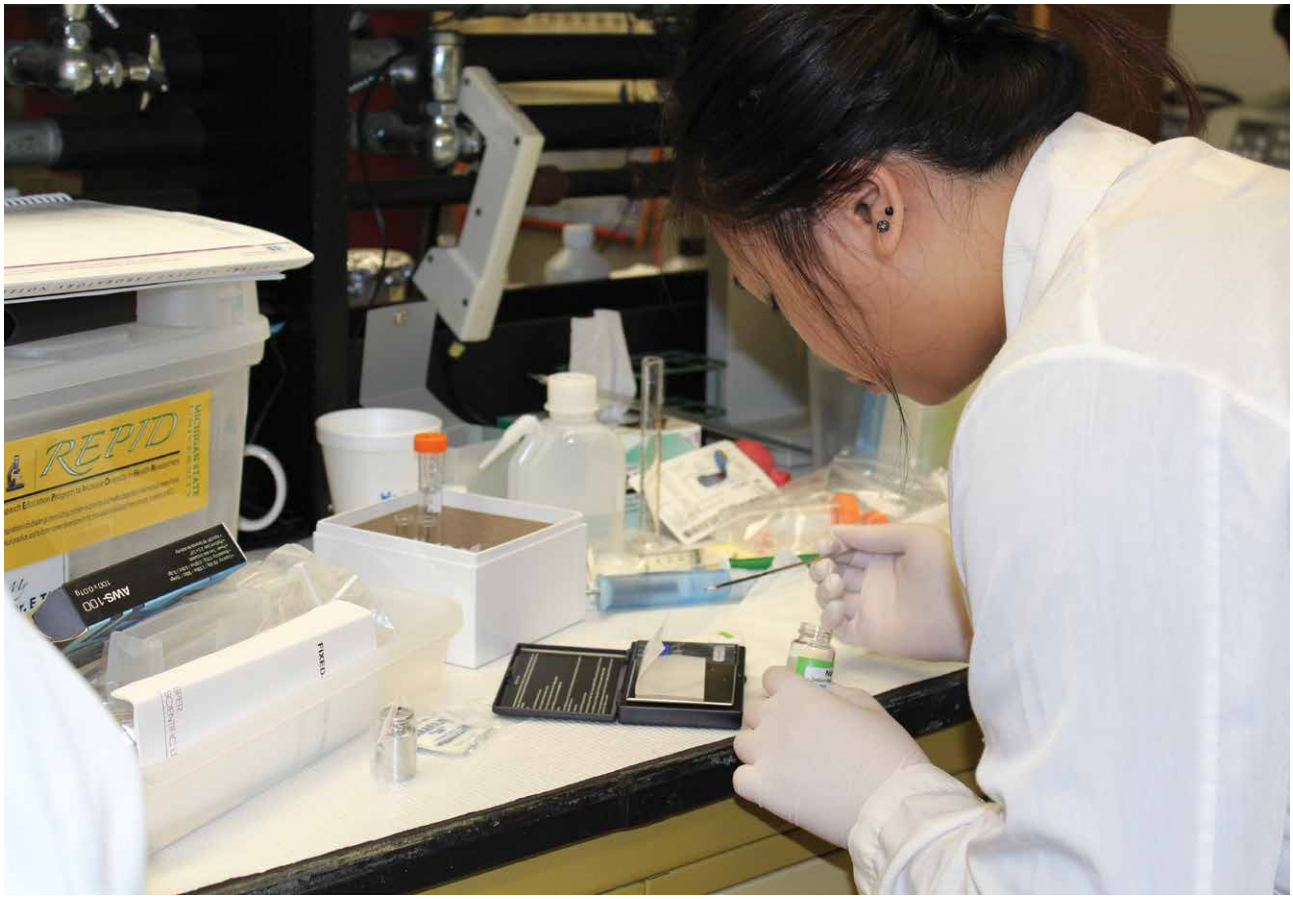



Moreover, by promoting direct interaction of the REPID scholars with their mentors, graduate and medical students and faculty clinicians, and by encouraging scholars to present their research findings at symposiums, meetings and conferences, the program instils self-confidence and cultivates positive attitudes toward learning and professional development.

The scholars come away with an understanding of current research issues and identify career paths in which they can make a contribution to advance research and improve public health. REPID scholars have access to several resources that are tailored towards their successful entry into advanced medical and/or graduate programs.
Scholars are given an individualised developmental plan, which identifies barriers to success and provides personalised suggestions by the mentors and the advisory committee. The program fosters the development of professional skills and good research and clinical practice, all of which greatly helps students to establish and launch successful careers in the biomedical sciences.

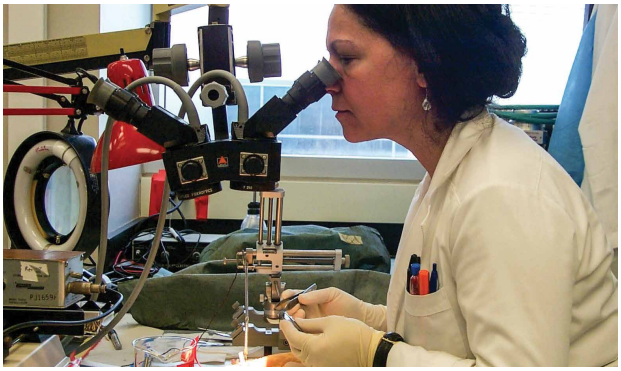
**Unity in Diversity, Diversity in Society**

Since 2011, Dr Crockett has helped mentor over 100 REPID scholars in a wide variety of topics including but not limited to heart, lung and blood disease disciplines. Funded by the National Institutes of Health and the National Heart, Lung and Blood Institute (NIH – NHLBI), the REPID program builds on the foundation provided by existing supportive structures at MSU, such as the premedical/human biology undergraduate and biomedical/medical graduate programs.

MSU provides a vibrant environment for student career development, with a strong emphasis on inclusiveness and diversity. With dedicated talented mentors whose research spans a wide spectrum of biomedical science, REPID scholars experience highly interdisciplinary research that is aimed towards solving global health issues.

These scholars acquire in-depth knowledge into basic biomedical techniques including the growth of isolated cells in the laboratory or cell culture, molecular biology techniques, microscopy and reagent preparation, setting them up for a successful career in research and clinical practice.

Dr Crockett has also developed a mobile laboratory kit that students can use to practice their laboratory skills and assignments remotely with online faculty guidance. All students



also get the experience of presenting at the annual summer undergraduate research conference at MSU, with some also going on to give national and international oral and poster presentations.

**Focus on Health Research Problems**

Dr Crockett's research focuses on understanding the molecular and cellular mechanisms of the inflammatory response to injury of different tissues such as the liver. Through the use of mouse models, her research has provided several insights into Hepatic Ischemia Reperfusion Injury (HIRI). This type of injury, which occurs in the liver, is caused when a tissue that has been damaged regains its blood and oxygen supply.

Paradoxically, this injury is often more severe than the original injury and may lead to several complications such as increased postoperative recovery time, multiple organ failure and even death. Dr Crockett and her mentees, who are often undergraduate or graduate students from underrepresented backgrounds, have shown how developing a new form of therapy, called anti-adhesion therapy, might be a useful method to improve survival outcomes and decrease organ injury in HIRIs.

Their research showed that this likely works through the regulation of inflammatory mediators called cytokines/chemokines. The team's research has also shown that due to differences in the levels of hormones, female mice are more capable of responding and resolving tissue injury compared to male mice. They have also identified that the best method of blood collection from mice is from the heart and that gender differences and the location of blood collection could significantly affect the interpretation of results that are generated in different studies.

In addition to her research into tissue injury, Dr Crockett engages in research that aims to improve the health conditions of minority groups. For instance, a recent study carried out by REPID scholars under the mentorship of Dr Crockett and Dr Won Song, published in the journal BMC Public Health in 2016, identifies the role of the nutritional attitudes of childcare providers of Migrant and Seasonal Head Start Programs (MSHS) in determining their health status and its association with migrant childhood obesity.

The study showed that childcare providers who practised weight loss methods and were dissatisfied with their weight were more likely to be obese/overweight compared to those who displayed healthy eating behaviours. Given that migrant children spend a considerable amount of time with non-family childcare providers, they fall in a high-risk category for developing health conditions such as obesity. The research suggested that the nutritional health status of young children enrolled in MSHS programs can be improved through offering nutrition education to the childcare providers that work in these programs.

The REPID program encourages scholars to pursue meaningful healthcare-related research. Accordingly, REPID alumni have gone on to excel in careers related to biomedical science. Dr Crockett and her team report that out of 66 REPID scholars that had been recruited over the first four years of the program, 24 continued to pursue their undergraduate program at MSU, 15 went into medical schools across the US, 11 pursued graduate programs across the US and nine scholars proceeded to take on careers in a health profession.

**Looking Towards a Diverse Future**

Programs such as REPID ensure that the future of healthcare research and the healthcare industry is in safe hands, with a focus towards cultural inclusiveness and sensitivity. The REPID program was awarded the '2015 Association of the American Medical Colleges building bridges and spanning boundaries award' for their innovation in research and research education. They have been nationally recognised several times as a successful program that fosters diversity and inclusiveness.

Dr Crockett has plans to expand the REPID program in the coming years. Armed with NIH funding until 2021, she plans to develop the program even further to include more underrepresented minority students. 'I would like to expand my training online to reach students and learners in remote areas or towns that don't have access to university and research institutions. In particular, I am interested in teaching biomedical science to girls. They should know that girls are smart and can be great scientists and even get the Nobel Prize!'

# Meet the researcher

**Dr Elahé Crockett**
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Dr Elahé Crockett has served as a research scientist, educator and administrator throughout her career. She received a BS degree in Medical Technology, and after working for the WHO (World Health Organization), she pursued a Master's degree in Clinical Laboratory Pathology. After obtaining her PhD in human anatomy at Michigan State University (MSU), she pursued a National Institutes of Health Post-Doctoral Fellowship, training in Immunopathology at the University of Michigan (UM) Medical School. She worked for ten years at UM as Assistant Research Professor and currently serves as a Professor in the Department of Medicine at MSU where she researches leukocyte biology, inflammation and tissue injury. Since 2011, she has also been serving as the director of the REPID (Research Education Program to Increase Diversity in Health Researchers) program and has trained many undergraduate/graduate students, and medical professionals in biomedical research.

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## FUNDING

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