



Texas A&M One Health Grand Challenge Research Initiative

12-Month Final Report of Five Seed Grants:

November 1, 2014 – October 31, 2015

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Table of Contents

About the Principal Investigators	Page 3
Executive Summary	Page 4-5
Summary of Metrics	Pages 6-7
Sarah Hamer, Global Health and Security Theme	Pages 8-14
College of Veterinary Medicine & Biomedical Sciences	
Arum Han, Accessible and Affordable Healthcare Theme	Pages 15-18
College of Engineering	
Sara Lawhon, Chronic Diseases and Conditions Theme	Pages 19-23
College of Veterinary Medicine & Biomedical Sciences	
Suresh Pillai, Safe and Available Food and Water Theme	Pages 24-33
College of Agriculture & Life Sciences	
Tom Welsh, Chronic Diseases and Conditions Theme	Pages 34-50
College of Agriculture & Life Sciences, College of Veterinary Medicine & Biomedical Sciences	

Note: Several acronyms are used throughout this report and are defined below.

TAMU: Texas A&M University

TAMUS: Texas A&M University System

CVM: Texas A&M College of Veterinary Medicine & Biomedical Sciences

COALS: Texas A&M College of Agriculture and Life Sciences

TAMHSC: Texas A&M Health Science Center

NIH: National Institutes of Health

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About the Principal Investigators



Sarah Hamer, BS, MS, DVM, PhD

(College of Veterinary Medicine & Biomedical Sciences (CVM) – Global Health and Security theme) addressed ecological issues impacting Chagas disease transmitted by kissing bug insects, primarily in high-risk Texas-Mexico border communities (“colonias”).



Arum Han, BS, MS, PhD

(College of Engineering – Accessible and Affordable Healthcare theme) developed *in vitro* microsystems that closely mimic physiology of whole organisms to overcome limitations of currently used *in vitro* and animal models for research on neurodegenerative diseases, immune systems, and the human microbiome.



Sara Lawhon, BS, DVM, PhD, DACVM

(CVM – Chronic Diseases and Conditions theme) worked on research compliance requirements and proof-of-concept for a project determining whether intervention in pets affects methicillin-resistant *Staphylococcus aureus* (MRSA, antimicrobial-resistant bacteria) decolonization in human patients.



Suresh Pillai, BS, MS, PhD

(College of Agriculture & Life Sciences (COALS) – Safe and Available Food and Water theme) focused on applications of unique electron beam technology aimed at eradicating waterborne, foodborne, and feedborne infectious diseases in humans and animals; ensuring global food supply security through new packaging, treatment, and processing methods; and exploring the use of this technology in improving food and water quality.



Tom Welsh, BS, PhD

(COALS, CVM – Chronic Diseases and Conditions theme) established transdisciplinary, cohesive research teams focused on stressors and environments that promote development of depression, illnesses and chronic diseases by altering various genes that regulate stress responsiveness and metabolic health.

Texas A&M (TAMU) One Health Grand Challenge Research Initiative 12–Month Final Report of Five Seed Grants: November 1, 2014 – October 31, 2015

Executive Summary

Background: In 2014, the Texas A&M One Health Initiative program identified 4 major themes and invited all Texas A&M faculty to submit research proposals which were interdisciplinary, collaborative, transformative, and addressed One Health societal needs. Five of the 23 proposals submitted were selected for funding. Funding for 4 projects originated from the Texas A&M Council of Deans and the Vice President for Research, and the fifth project from an external private donor.

The 4 themes were: Global Health and Security, Accessible and Affordable Healthcare, Chronic Diseases and Conditions, and Safe and Available Food and Water. The principal investigators (PI), their colleges, theme, project title, and brief statement for each are listed below. Four were each awarded \$50,000, and Dr. Lawhon was awarded \$25,000.

Principal Investigators:

- **Sarah Hamer** (College of Veterinary Medicine & Biomedical Sciences (CVM) – Global Health and Security theme) addressed ecological issues impacting Chagas disease transmitted by kissing bug insects, primarily in high-risk Texas-Mexico border communities (“colonias”).
- **Arum Han** (College of Engineering – Accessible and Affordable Healthcare theme) developed *in vitro* microsystems that closely mimic physiology of whole organisms to overcome limitations of currently used *in vitro* and animal models for research on neurodegenerative diseases, immune systems, and the human microbiome.
- **Sara Lawhon** (CVM – Chronic Diseases and Conditions theme) worked on research compliance requirements and proof-of-concept for a project determining whether intervention in pets affects methicillin-resistant *Staphylococcus aureus* (MRSA, antimicrobial-resistant bacteria) decolonization in human patients.
- **Suresh Pillai** (College of Agriculture & Life Sciences (COALS) – Safe and Available Food and Water theme) focused on applications of unique electron beam technology aimed at eradicating waterborne, foodborne, and feedborne infectious diseases in humans and animals; ensuring global food supply security through new packaging, treatment, and processing methods; and exploring the use of this technology in improving food and water quality.
- **Tom Welsh** (COALS and CVM – Chronic Diseases and Conditions theme) established transdisciplinary, cohesive research teams focused on stressors and environments that promote development of depression, illnesses and chronic diseases by altering various genes that regulate stress responsiveness and metabolic health.

Report Content: This final report includes a summary table of metrics (Table 1) and individual reports from each of the 5 principal investigators detailing their team members, students, grants, publications, outreach, and impact.

Overall Impact: The Texas A&M Council of Deans, Vice President for Research, and the external donor are thanked for their vision and financial support for these projects. These One Health productive interdisciplinary PIs leading their research teams have demonstrated excellent return on the \$225,000 investment. The vision of the Texas A&M One Health Initiative is that advancing and fostering committed productive interdisciplinary research teams who are addressing societal needs will assure our position as the global institutional leader.

**Table 1. Texas A&M One Health Grand Challenge Research Initiative
12-Month Final Report of Five Seed Grants: Summary of Metrics**

<i>Principal Investigators (PIs)</i>	Hamer	Han	Lawhon	Pillai	Welsh
Funding Source	Council of Deans and VPR	Council of Deans and VPR	External donor	Council of Deans and VPR	Council of Deans and VPR
Theme	Global Health	Healthcare	Chronic Disease	Food and Water	Chronic Disease
Project Title	“Chagas disease”	“Microphysiological Biologics”	“Methicillin-resistance”	“Just Beam It”	“Stress and Obesity”
<i>Team Members</i>					
Number of CO-PIs	5	18	7	28	18
Number of Colleges/Institutions	6	6	4	14	10
<i>Student Involvement</i>					
Undergraduate students	2	1	0	7	10
Graduate students	5	5	2	12	12
Professional students	1	0	1	1	2
Postdoctoral students, research associates, clinical researchers, etc.	0	4	0	1	4
Total	8	10	3	21	28
<i>Grants and Funding</i>					
Number of grant proposals submitted to funding bodies	8 (federal, industry, academia)	5 (federal, industry, international)	1 (2 pending – industry, federal)	23 (federal, industry, and academia)	18 (federal, industry, academia, private)
Amount of funding submitted	\$ 1,850,729	\$ 3,588,350	\$ 25,000	\$ 23,456,187	\$ 11,983,876
Amount of funding awarded	\$ 755,699	\$ 388,391	\$ 25,000	\$ 885,000	\$ 602,880
Amount of funding not funded	\$ 1,095,030	\$ 2,299,978	\$ -	\$ 14,129,196	\$ 10,409,194
Amount of funding in review	\$ -	\$ 899,981	\$ -	\$ 8,441,991	\$ 971,802

**Table 1 (Continued). Texas A&M One Health Grand Challenge Research Initiative
12-Month Final Report of Five Seed Grants: Summary of Metrics**

	Hamer	Han	Lawhon	Pillai	Welsh
Publications					
In peer-reviewed scientific journals (impact factor)	2	0	3 (4.068)	2 (3.234, 1.380)	2 (2.108), 1 (4.632), 1 (1.535)
Submitted (impact factor)	0	0	2 (4.068), 1 (1.732)	3 (2.806), 2 (2.694), 2 (3.245), 1 (0)	0
In pipeline	1	0	0	0	3
Proof of concept	Chagas-positive humans, dogs, and vectors identified in medically-underserved border communities	Blood-Brain-Barrier (BBB)-on-a-chip Infection-on-a-chip	Antibody production and novel diagnostic test development	Metabolically Active yet Non-Culturable (MAyNC) state of irradiated cells	Post-traumatic stress disorder (PTSD) and pain sensitivity; testosterone and pain
Oral and poster conference presentations	3	3	5	18	36
Oral and poster non-conference presentations	12	0	0	0	0
Outreach					
Outreach events	Developing app for public outreach	ENG-LIFE interdisciplinary workshop	None	“StomachFlu” app developed; Electron Beam hands-on workshop; others in report	Public symposium: “Evolution of Stress”
Other Impacts					
	Building relationships with communities and health providers along the border	Launched initiative, building preliminary data	Building collaborative research with multiple medical centers	3 invention disclosures, 1 provisional patent, technology used in new facilities	Links with Scott & White Hospital, VA Hospital, Healthy South Texas Initiative