SUBMITTED BY: **STEPHEN M. LANIER, PH.D.**
VICE PRESIDENT FOR RESEARCH

RESEARCH AWARDS OVER $500,000
QUARTERS 1 AND 2 – FY 2015

Principal Investigator: Dr. Steven Lipshultz, Department of Pediatrics, School of Medicine
Sponsor: National Heart, Lung and Blood Institute
Title: Genotype-Phenotype Associations in Pediatric Cardiomyopathy
Anticipated Total: $2,092,559
Effective Dates: Apr. 1, 2015 – Mar. 31, 2016
Description: Cardiomyopathies (diseases of the heart muscle) are a leading cause of heart failure, death, and heart transplantation in children, yet time to transplant or death for children with cardiomyopathy has not improved during the past 35 years, with the most economically advanced nations having no better outcomes than developing nations. The percentage of children with cardiomyopathy who received a heart transplant has not declined over the past 10 years and cardiomyopathy remains the leading cause of transplantation for children over one year of age. This R01 grant aims to identify genetic changes that cause or worsen cardiomyopathy, thereby improving the ability to optimally identify and manage these patients as well as provide insights into potential new therapeutic approaches.

Principal Investigator: Dr. Jonathan Cohn, Department of Internal Medicine, School of Medicine
Sponsor: State of Michigan Department of Community Health
Title: Detroit Public Health Clinical Services for the Control and Prevention of Sexually Transmitted Disease (STD)
Anticipated Total: $1,843,000
Effective Dates: October 1, 2014 – September 30, 2015
Description: This project will provide services for the control and prevention of sexually transmitted diseases in the city of Detroit.

Principal Investigator: Dr. Steven Firestine, Department of Pharmaceutical Science, Eugene Applebaum College of Pharmacy and Health Sciences
Sponsor: University of Nevada, Las Vegas
Title: Prophylaxis of Clostridium Difficile Infection
Anticipated Total: $1,090,720
Effective Dates: December 1, 2014 – November 30, 2019
Description: The goal of this collaborative grant is to study spores of the bacterium clostridium difficile that can cause hospital-borne infections that put cancer, AIDS, and transplant patients at risk. This proposal aims to discover stable compounds that will prevent clostridium difficile infections.

Principal Investigator: Dr. Nerissa Villegas, Department of Oncology, School of Medicine
Sponsor: National Cancer Institute
Title: Delineating tumors with resistance to tyrosine kinase therapy via PET imaging
Anticipated Total: $977,015
Effective Dates: December 1, 2014 – November 30, 2017
Description: This project will investigate new and existing PET imaging biomarkers with high potential as a tool for detecting malignancies and monitoring response to therapy in breast cancer. The overall goal seeks to develop companion diagnostics for monitoring treatment of breast cancer that are resistant to targeted treatment due to induced feedback pathways.

Principal Investigator: Dr. Takeshi Sakamoto, Department of Physics, College of Liberal Arts and Sciences
Sponsor: National Science Foundation
Title: CAREER: Determine the mechanical properties of molecular motors in vesicle transports
Anticipated Total: $692,792
Effective Dates: January 1, 2015 – December 31, 2019
Description: This project studies a novel molecular movement in live cells by which non-processive molecular motors like myosin Vc may demonstrate processive activities by clustering and working together. The project offers an interdisciplinary training opportunity for undergraduate and graduate students (including members of underrepresented groups) who will conduct state-of-the-art microscopy, as well as biochemistry and molecular biology experiments combined with computational modeling. Students will have opportunities to present their work at national and international conferences.

Principal Investigator: Dr. Dana Kissner, Department of Internal Medicine, School of Medicine
Sponsor: State of Michigan Department of Community Health
Title: TB Control
Anticipated Total: $651,668
Effective Dates: October 1, 2014 – September 30, 2015
Description: This project will establish and operate a medical clinic in Detroit for the benefit of public health that specializes in the diagnosis and treatment of tuberculosis.

Principal Investigator: Dr. Christine Davie, Department of Pharmacy Practice, Eugene Applebaum College of Pharmacy and Health Sciences
Sponsor: National Institute of Mental Health
Title: Cannabinoid Control of Fear Extinction Neural Circuits in Post-Traumatic Stress Disorder
Anticipated Total: $649,165
Effective Dates: September 25, 2014 – February 28, 2018
Description: Exposure therapy is a first-line approach in the treatment of post-traumatic stress disorder (PTSD) and works by repeated exposure to trauma-related thoughts, feelings and situations in order to reduce the distress they cause. Exposure therapy is generally effective, but a significant number of patients have incomplete responses or fail to sustain improvements over time. The goal of this project is to investigate the cannabinoid system as a potential pharmacological target for improving the learning that goes on in therapy and perhaps increasing efficacy and durability of exposure therapy in treating PTSD (e.g. shortening treatment while strengthening and prolonging gains).

Principal Investigator: Dr. Joy Alcedo, Department of Biological Sciences, College of Liberal Arts and Sciences
Sponsor: Harvard University
Title: Functional Characterization of an Insulin-Like Peptide Network That Regulates Learning
Anticipated Total: $613,500
Effective Dates: September 5, 2014 – August 31, 2018
Description: Insulin or insulin-like signaling is important for animals to learn to adapt to their environment. Deregulation of this signaling leads to severe cognitive and/or behavioral disorders in many animals that range from the nematode worms to rodents and humans. In all these animals, insulin signaling can involve the different activities of a family of insulin/insulin-like proteins. Humans have 10 insulin or insulin-like proteins, whereas the worm has 40 such proteins. In the worm, these insulin/insulin-like proteins exist as a network, where the proteins can regulate each other's activities depending on the animal's environment. This study aims to understand how this network affects the animal's ability to learn under different conditions, which could provide insights into human cognitive and behavioral disorders.

Principal Investigator: Dr. Jay Berman, Department of Obstetrics and Gynecology, School of Medicine
Sponsor: Gynesonics, Inc.
Title: Evaluation of the Gynesonics System for Transcervical Treatment of Symptomatic Uterine Fibroids with Radiofrequency Ablation under Integrated Intrauterine Sonography Guidance
Anticipated Total: $599,820
Effective Dates: December 5, 2014 – August 15, 2015
Description: This project aims to establish the safety and effectiveness of the VizAblate System in the treatment of symptomatic uterine fibroids in nearly 150 patients.

Principal Investigator: Dr. Jinsheng Zhang, Department of Otolaryngology, School of Medicine
Sponsor: University of Arizona
Title: Developing TNF-alpha-Mediated Treatment for Blast-Induced Tinnitus
Anticipated Total: $575,100
Effective Dates: January 15, 2015 – December 31, 2017
Description: This project aims to determine the effects of blast exposure on TNF-a expression in peripheral and central auditory regions and determine whether TNF-a inhibitors reverse those effects. It also aims to investigate the therapeutic effects of TNF-a inhibitors on blast-induced tinnitus, TBI and anxiety behaviors.

Principal Investigator: Dr. Sarah Brownlee, Department of Geology, College of Liberal Arts and Sciences
Sponsor: National Science Foundation
Title: CAREER: Seismic Anisotropy, Symmetry and Structure - Translating Laboratory Measurements into Seismic Interpretations
**Anticipated Total**: $527,248
Effective Dates: February 1, 2015 – January 31, 2020
Description: The research objective of this project is to determine the factors controlling the magnitude and symmetry of lower crustal seismic anisotropy - directional dependence of seismic velocity - from cm- to km-scale. The PI proposes to improve our understanding of the causes of seismic anisotropy in the crust by developing a predictive framework linking mineralogy, texture, and structure to seismic anisotropy using middle and lower crustal rocks exposed at gneiss domes in the northeastern United States.
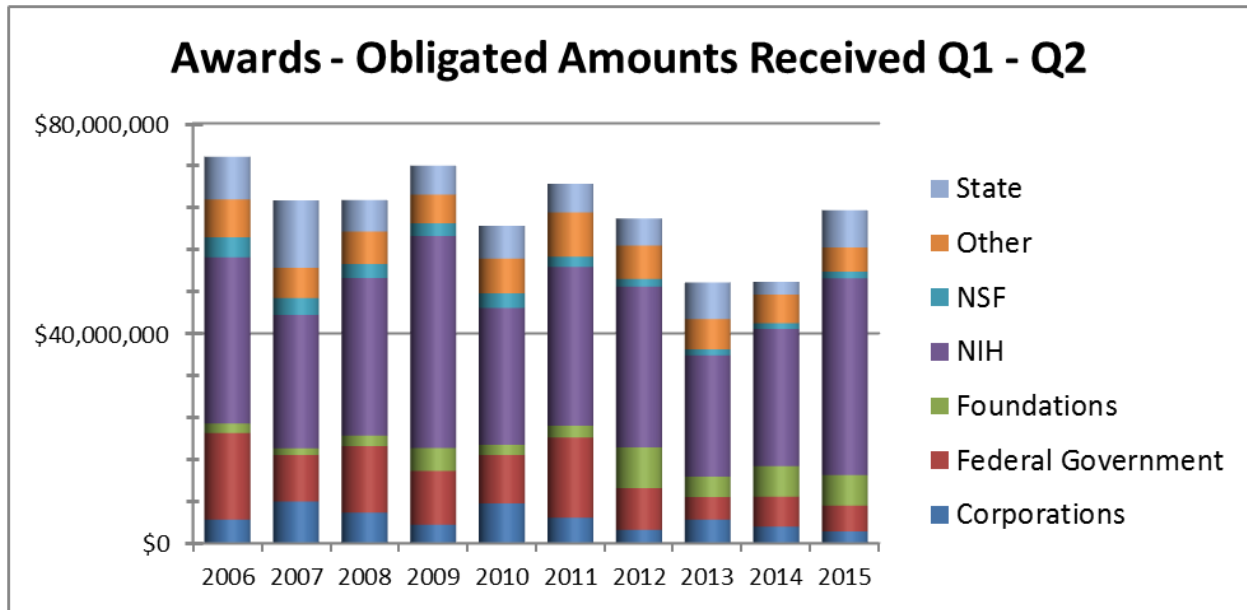
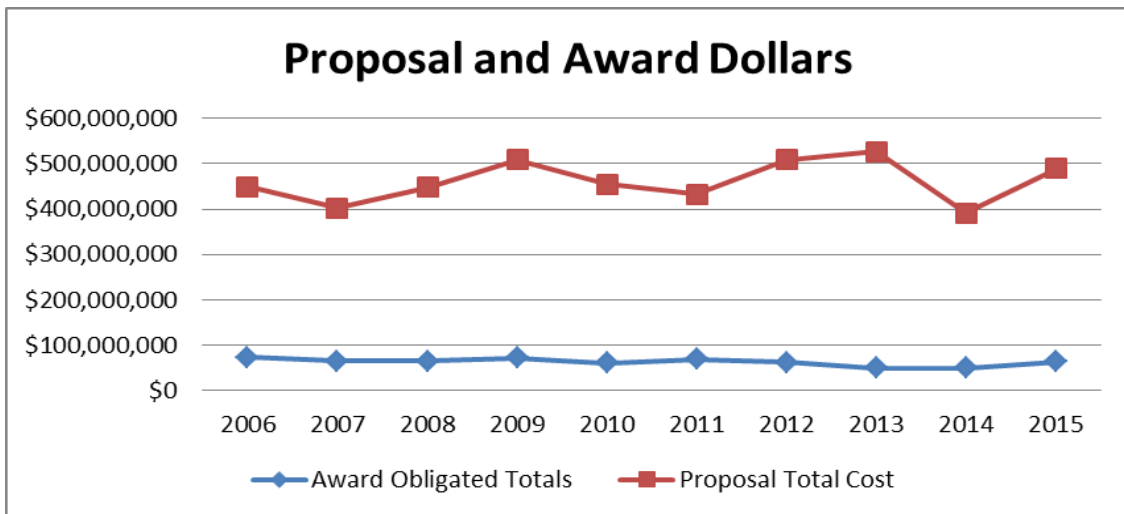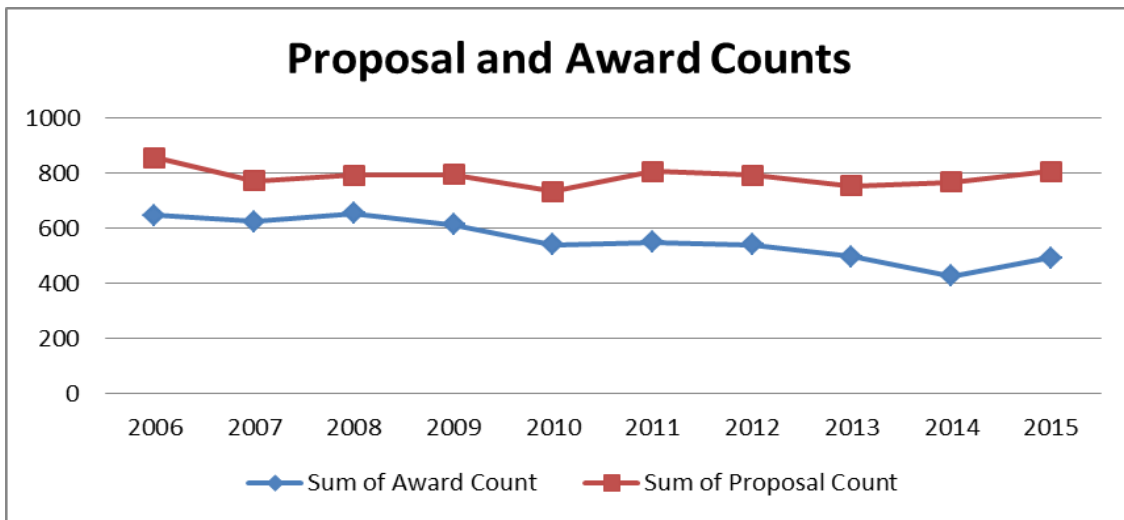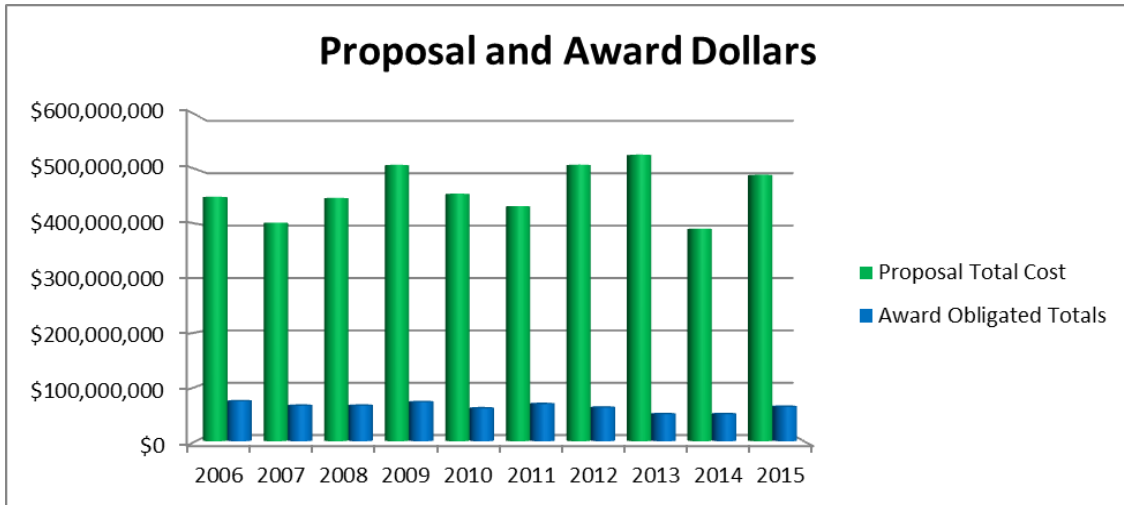Awards – Obligated Amounts Received Q1-Q2 (in millions):

Sponsor Type	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
State	$8.102	$12.861	$6.033	$5.569	$6.222	$5.482	$5.181	$6.942	$2.387	$7.141
Other	$7.263	$5.800	$6.159	$5.446	$6.592	$8.390	$6.380	$5.790	$5.461	$4.579
NSF	$3.778	$3.188	$2.686	$2.398	$2.807	$1.958	$1.404	$1.167	$1.125	$1.277
Foundations	$1.797	$1.280	$1.984	$4.405	$1.969	$2.268	$7.778	$3.913	$5.806	$5.788
Other Federal	$16.540	$8.880	$12.673	$10.257	$9.168	$15.276	$7.893	$4.256	$5.680	$4.914
Corporations	$4.485	$7.951	$5.862	$3.517	$7.631	$4.884	$2.596	$4.532	$3.187	$2.283
NIH	$31.685	$25.400	$30.033	$40.383	$26.085	$30.233	$30.663	$23.088	$26.142	$37.503
Grand Total	**$73.651**	**$65.360**	**$65.430**	**$71.976**	**$60.474**	**$68.492**	**$61.893**	**$49.688**	**$49.788**	**$63.486**

Proposal and Award Dollars

Proposal and Award Counts

Proposal and Award Dollars

TECHNOLOGY COMMERCIALIZATION FY 2015 Q2 METRICS

License Agreements

	2013	2014	2015
4th Qtr	3	0	
3rd Qtr	1	1	
2nd Qtr	0	1	3
1st Qtr	1	5	1

■ 1st Qtr ■ 2nd Qtr ■ 3rd Qtr ■ 4th Qtr

Invention Disclosures

	2013	2014	2015
4th Qtr	14	18	
3rd Qtr	17	13	
2nd Qtr	19	15	22
1st Qtr	18	16	16

■ 1st Qtr ■ 2nd Qtr ■ 3rd Qtr ■ 4th Qtr

Revenue
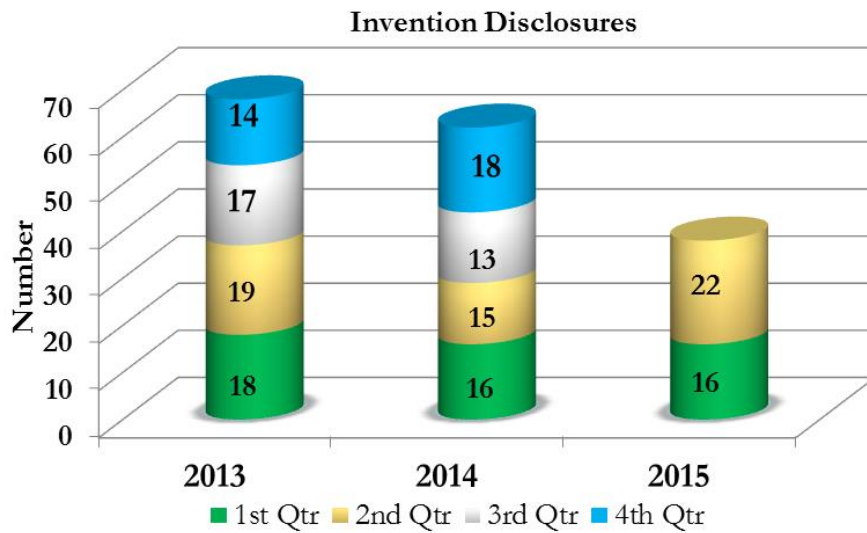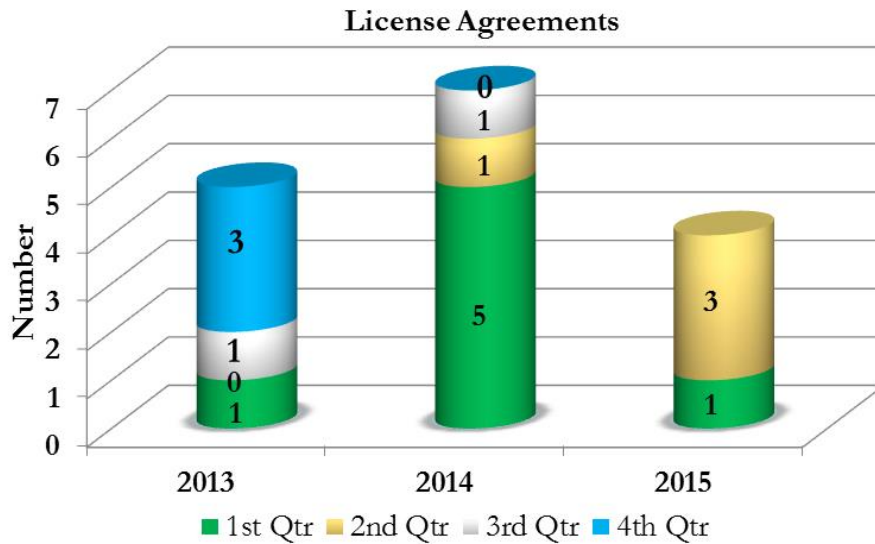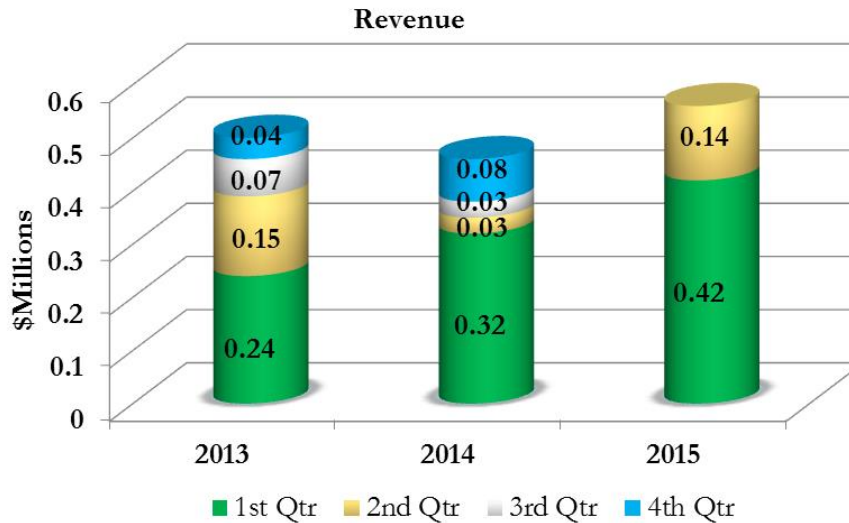
WAYNE STATE UNIVERSITY START-UPS
FY 2010 – FY 2015

Company Name	Faculty Inventor /Department	Fiscal Year
NextCat, Inc.	Simon Ng**, Steve Salley** Chemical Engineering and Materials Science	2010
Advaita Corp.	Sorin Draghici **, Computer Science	2010
Interva, Inc.	Steve Ondersma**, Psychiatry and Behavioral Neurosciences	2010
RetroSense Therapeutics, LLC	Zhou-Han Pan, Ophthalmology	2011
Viteava Pharmaceuticals Inc.	Q. Ping Dou, Oncology	2013
Oncoceutics, Inc.	Gen Sheng Wu, Oncology	2013
Flag Therapeutics, Inc.	Larry Matherly, Pharmacology	2014
Detroit Materials, Inc.	Susil Putatunda, Chemical Engineering and Materials Science	2014
Functional Fluidics, LLC	Patrick Hines**, Pediatrics	2015
Qurgen, Inc.	Jianjun Wang**, Pathology	2015

** Faculty inventors that also are the entrepreneurs of the start-up company.

UPDATES

- Technology Commercialization is on track to meet or exceed the metrics from the last two years. License revenue for the first two quarters of 2015 shows significant improvement and currently exceeds total revenue for FY2013 or FY2014.

- Technology Commercialization, through the NEI supported Technology Development Incubator, funded six projects in April, 2015. The projects were

each awarded $25,000 for technical and/or business validation studies and included

- o Infrared Mitochondrial Therapy Device for prevention of reperfusion injury
- o Centrifuge Assisted Preparation (CAP) for Li-ion Batteries. The technology is a novel process to prepare unique nanostructures for application in next generation high energy/power lithium ion batteries.
- o Topical Gel to Treat Diabetic and Corneal Skin wounds
- o A Compact, High Power Density Inverter for the conversion of DC to AC current in multiple applications such as energy storage and communication systems
- o Fetal Guardian: a mobile phone application for in home monitoring of high risk pregnancies
- o "Academica " Enterprise Social Portal : the next generation software platform for enterprise management of intranet portal applications

- **Dr. Guangzhao Mao**, College of Engineering, recently received a $200,000 Partnerships for Innovation award from the National Science Foundation, *Developing Low-Cost Nanowire Sensors Based on a Seed-Mediated Solution Process.* Dr. Mao's work was initially supported by the Technology Development Incubator program for both funding and the industry mentorship. The additional follow-on funding from the NSF will greatly assist in further validation and acceleration of commercialization of the nanowire sensors technology. Dr. Mao also credited the TDI activities as being instrumental in securing an award of $329,000 from the National Science Foundation for the project, *Development of an Undergraduate Certificate Program in Nanoengineering for Training the Workforce of Tomorrow,* in July 2014.

- *RetroSense Therapeutics*, a Wayne State University start-up company, was one of three finalists and was awarded the Luis Villalobos Award from the Angel Capital Association, the world's leading professional association for angel investors. RetroSense was honored in a special awards ceremony on April 15th the 2015 ACA Summit that took place in San Diego. The award is named in memory of Luis Villalobos, who angel investors nationwide admired for actively investing in and mentoring ingenious, creative and innovative startups.

  RetroSense Therapeutics, is a biotechnology company developing life-enhancing gene therapies designed to restore vision in patients suffering from blindness due to retinitis pigmentosa (RP) and advanced dry age-related macular degeneration (advanced dry-AMD). **Zhuo-Hua Pan, Ph.D.,** professor of anatomy and cell biology and director of research at the Kresge Eye Institute in the School of Medicine, along with colleagues at Salus University in Pennsylvania, developed the breakthrough therapy and follow-on approaches that offer promise to people suffering with this incurable blindness. There are currently no FDA approved

drugs to improve or restore vision in patients with these retinal degenerative conditions.

RetroSense Therapeutics received their nomination because advanced gene therapy is a difficult field for angel investors or underfunded entrepreneurs. The founders of RetroSense have stayed focused on their campaign to restore sight. This is extraordinary for optogenetics, a field that assumes a long and slow costly clinical process.

For more information about RetroSense Therapeutics, visit http://retro-sense.com.