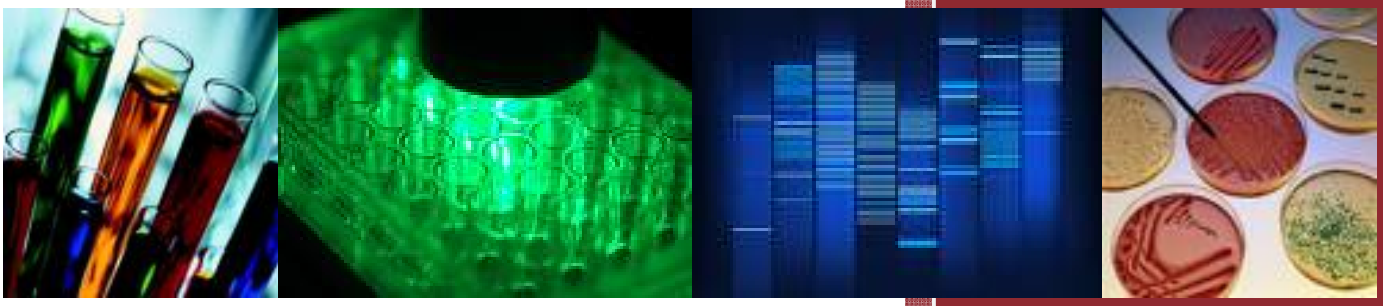
Poster Session and Reception

2016

Summer Research Program



July 29, 2016
9:00 AM - 3:00 PM
Health Professions Education Building
Bryan, TX

HEALTH SCIENCE CENTER
TEXAS A&M UNIVERSITY

Schedule of Events

July 29, 2016

8:30am	**Registration Table Opens** HPEB LL Lobby
9:00am-12:00pm	**Poster Viewing** HPEB LL43 A&B
12:00am	**Lunch** HPEB LL11 A&B
1:00-2:00pm	**SRP Featured Speaker** **Dr. Robert Alaniz** *"Metabolite-mediated Mechanisms of Microbiota Regulation of the Mucosal Immune System"* HPEB LL46
2:00-3:00pm	**Closing Remarks and Presentation of Certificates** Dr. Brett Mitchell, Summer Research Program Director HPEB LL46 **Presentation of Dean's Recognition Awards** HPEB LL46
3:00pm	**Adjourn**

Acknowledgements

The Texas A&M Health Science Center College of Medicine's Summer Research Program continues to attract the top students from universities all across the country. This year we had 33 participants who completed the 10-week program. These students were selected from a large pool of applicants based on their research experience, desire to attend graduate and/or medical school, grades, exam scores, and letters of recommendation. I would like to thank the selection committee who dedicated their time to read through each application.

- Kayla Bayless, Ph.D.
- Sharon DeMorrow, Ph.D.
- David Huston, M.D.
- Xu Peng, Ph.D.
- Samba Reddy, Ph.D.
- Mendell Rimer, Ph.D.
- Emily Wilson, Ph.D.
- Warren Zimmer, Ph.D.

I would also like to thank the faculty that gave their time as mentors. You have provided each of these students with a valuable experience that will undoubtedly help them achieve their career goals. The program would not be able to sustain its quality without you.

The program was made possible by the following people who provided the funding and sponsorships.

- Dean Paul Ogden, M.D. – Texas A&M Health Science Center
- Van Wilson, Ph.D. – Texas A&M Health Science Center
- Jack Hart, Ph.D. – Temple Health and Bioscience District
- Robert Dearth, Ph.D. – University of Texas Rio Grande Valley
- Dennis Daniels, MPH, Dr.PH – Prairie View A&M University
- Adebayo Oyekan, DVM, Ph.D. – Texas Southern University
- Warren Zimmer, Ph.D. – Texas A&M Health Science Center

Each week we had Roundtable Discussions in which students got to individually engage with faculty mentors at their respective locations regarding numerous "behind the scenes" aspects of science. This was made possible by the time and dedication of the following Site Coordinators:

- Temple – Drs. Xu Peng and David Dostal
- Houston – Drs. David Huston and Margie Moczygemba

Finally, I would like to thank the SRP Coordinator **Mary Ann Wolff** who did a ton of work arranging the arrival, housing, registration, processing, and weekly feeding of the students. Thank you as well to **Monica Flores** in Bryan/College Station, **Tammy Kocurek** in Houston, and **Manuela Smith** in Temple who kept each of the sites running smoothly. Thank you to our poster judges who had an extremely difficult task of picking the best out of the best. Thank you students for your hard work and everyone for a memorable summer – Gig 'em!

Brett Mitchell, Ph.D.
Director, Summer Research Program

Abstracts

TAMHSC SUMMER RESEARCH PROGRAM

August 7, 2013: 9:00 AM - 4:00 PM
Health Professions Education Building
Bryan, Texas

Evaluation of Novel Allosteric Modulators of the Endocannabinoid System using Rat Neural Stem Cells

Claire Adkins[3], Bharathi Hattiangady[1,3], Dai Lu[2,3], Ashok Shetty[1,3]
[1]Institute for Regenerative Medicine, Department of Molecular and Cellular Medicine, [2]Department of Pharmaceutical Sciences , [3]College of Medicine, Texas A & M University Health Science Center

Introduction: Neural stem cells (NSCs) exist in two important regions in the adult brain and contribute to ongoing neurogenesis. The hippocampal NSCs play an important role in learning, memory and mood, while sub-ventricular NSCs are important in olfactory function and probably in brain repair in pathological conditions such as stroke. The extent of NSC proliferation and adult neurogenesis are regulated by many physiological and pathological conditions. The endocannabinoid (eCB) system has been found to play a role in neurogenesis as neural stem cells have cannabinoid receptors and the modulation of their expression can induce neural stem cell proliferation, regulate neuroblast migration and determine neural cell fate. In this study we tested four different micro compounds that are allosteric modulators of cannabinoid receptors for their ability to stimulate NSC activity in vitro.

Specific aim: To screen four micro compounds (ORG27569, LDK1240, LDK1241, and ICAM-b) that are allosteric modulators of cannabinoid receptors for their ability to stimulate neural stem cell activity in vitro.

Methodology:

Neurosphere assay: We screened four different CBN receptor modulator micro compounds namely LDK1240, LDK1241, ICAM-b and ORG27569 (provided by our collaborator Dr. Dai Lu) for their ability to influence neural stem cell activity. Neural stem cells (NSC) were obtained from PND-2, GFP+ transgenic rat, anterior sub-ventricular zone (aSVZ). We plated 10,000 cells in 6 well plates using proliferation medium containing all four micro compounds in three different concentrations (1000nm, 100nm and 10nm). Normal control and DMSO controls were run parallel. On day 7, the yield of neurospheres was quantified under the epiflurescence microscope for all 14 groups (4 compounds x3 dilutions, normal control and DMSO control). Based on the results of above experiment, we selected two promising compounds (LDK 1240 and LDK 1241) at 100nm concentration and further confirmed their ability to stimulate NSC activity with a low-density neurosphere assay (100 cell per well in 24 well plates; n=24).

Differentiation culture: To further confirm whether, both LDK 1240 and LDK 1241 also influence neuronal differentiation, we expanded aSVZ NSCs in proliferation medium containing these two drugs at 100nm concentration for 7 days and then differentiated them on a Poly-L- Lysine coated 24 well plate. At day 6 cultures were fixed in 2% paraformaldehyde and stained for TUJ-1(marker for neurons), GFAP (marker for astrocytes) or O1 (marker for oligodendrocytes). We quantified and compared the % of neurons, astrocytes and oligodendrocytes in treated, DMSO or naïve group.

Culture in the absence of trophic factors: In order to test whether, these two micro compounds maintain NSC activity in the absence of EGF and FGF-2, we ran another experiment where NSCs were plated in proliferation medium containing no EGF and FGF2.

Results and summary: Our initial screening experiment with high density neurosphere assay revealed that, out of four micro-compounds tested, two of them (LDK1240 and LDK 1241) are promising with a significantly higher yield of neurospheres. The yield of neurospheres at day 7 was 50% more in the presence of LDK1240 and was 54% higher in the presence of LDK 1241. Further confirmation using low density neurosphere assay also showed similar trend. The results of differentiation assay however, did not show any difference in terms of yield of neurons. We found that ~ 25-29% TUJ-1+ neurons in both treated and control groups differentiated into neurons.

Further, the cultures grown in the absence of EGF and FGF2 did not show neurospheres in any groups until day 10. However, a parallel group that was expanded in the presence of EGF and FGF-2 had neurospheres. Thus, our additional experiment in the absence of trophic factors confirmed that none of these compounds are effective in NSC proliferation in the absence of trophic factors.

2016 Texas A&M Health Science Center
Summer Research Program Participants

Bryan/College Station		
Hayden Anz	Texas A&M University	Dr. Samba Reddy
Andrew Asante	Alabama State University	Dr. Stephen Safe
Preston Baker	Texas A&M University	Dr. Duane Steward
Lauren Beck	Case Western University	Dr. Kayla Bayless
Katharine Beckman	Ave Maria University	Dr. Brett Mitchell
Benjamin Boyett	Texas A&M University	Dr. Joe Rutkowski
Julia Bruggemann	Texas A&M University	Dr. Samba Reddy
Delfina Bur	University of Virginia	Dr. Farida Sohrabji
Alexis Carr	University of Houston	Dr. Sarah Bondos
Daisy Consuegra	University del Este Recinto de Carolina	Dr. Ursula Winzer-Serhan
Kerolayne de Almeida Costa	Texas A&M University	Dr. Jun-yuan Ji
Shruti Dharmaraj	New Jersey Institute of Technology	Dr. Robin Fuchs-Young
Yaritza Escamilla	University of Texas Rio Grande Valley	Dr. Jenny Hyde
Neha Gurram	Baylor University	Dr. Samba Reddy
Ashton Hierholzer	Oklahoma State University	Dr. Michelle Hook
Kayla Hudson	Texas A&M University	Dr. Brett Mitchell
Casey Hughes	University of Texas Rio Grande Valley	Dr. Zhilei Chen
Patrick Lynch	Cornell University	Dr. Paul de Figueiredo
Naveen Menon	Texas A&M University	Dr. Joe Rutkowski
Jeffrey Ogbudu	Alabama State University	Dr. Jeff Cirillo
Vinathi Polamraju	Texas A&M University	Dr. Julian Leibowitz
Amber Schulze	Baylor University	Dr. Duane Steward
Jordan Sweatt	Prairie View A&M University	Dr. Carolyn Cannon
CidNi Wilkerson	Prairie View A&M University	Dr. David Threadgill

Houston		
Yi-Hsuan Ku	University of Texas at Austin	Dr. Robert Tsai
Lovesimrjit Sandhu	University of Texas at Austin	Dr. David Huston
Jerry Stewart	Texas Southern University	Dr. Magnus Hook
Tung Vu	University of Houston	Dr. Dekai Zhang

Temple		
Lauren Canady	Texas A&M University	Dr. Sharon DeMorrow
John Connolly	University of Arkansas	Dr. David Dostal
Thanh Dinh	New Hampshire University	Dr. David Dostal
Pavia Ann Muringathuparambil	University of Texas at Austin	Dr. Xu Peng
Michael Schwalm	Baylor University	Dr. Shenyuan Zhang

2016 Texas A&M Health Science Center
Summer Research Program Seminar Series

Date	Time	Topic	Presenter
5/27	10:00 AM	Roundtable - Record Keeping	
5/31	12:00 PM	TAMHSC Graduate School Overview	Dr. Warren Zimmer
6/3	10:00 AM	Roundtable – Fitting in a Laboratory	
6/7	12:00 PM	CST*R Grand Rounds	Dr. Mansoor Khan
6/10	10:00 AM	Roundtable – Literature Review	
6/14	12:00 PM	Scientific Method	Dr. David McMurray
6/17	10:00 AM	Scientific Misconduct	Dr. Vernon Tesh
6/21	12:00 PM	Biotechnology & Ethics	Dr. Jim Samuel
6/24	10:00 AM	TAMHSC Clinical & Translational Science Track	Dr. David Huston
6/28	12:00 PM	TAMHSC Cardiovascular Track	Dr. Cindy Meininger
7/1	10:00 AM	Roundtable – Writing an Abstract	
7/8	10:00 AM	TAMHSC Neuroscience Track	Dr. Ursula Winzer-Serhan
7/12	12:00 PM	TAMHSC Biochemistry Track TAMHSC Microbial Pathogenesis-Immunology Track	Dr. Sarah Bondos Dr. Jon Skare
7/15	10:00 AM	Roundtable – Organizing Your Poster	
7/19	12:00 PM	TAMHSC Cellular & Molecular Biology Track TAMHSC MD-PhD Track	Dr. Kayla Bayless Dr. Carolyn Cannon
7/22	10:00 AM	Roundtable – How To Give a 10 Minute Talk	
7/25	10:00 AM	Student Presentations	
7/26	10:00 AM	Student Presentations	
7/27	10:00 AM	Student Presentations	
7/28	10:00 AM	Student Presentations	
7/29	9:00 AM- 3:00 PM	Poster Presentations, Reception, and Awards Ceremony	

Program Director

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