



# OUHSC Physiology Newsletter

An update on the people and research activities of  
the Department of Physiology  
University of Oklahoma Health Sciences Center,  
Oklahoma City, OK

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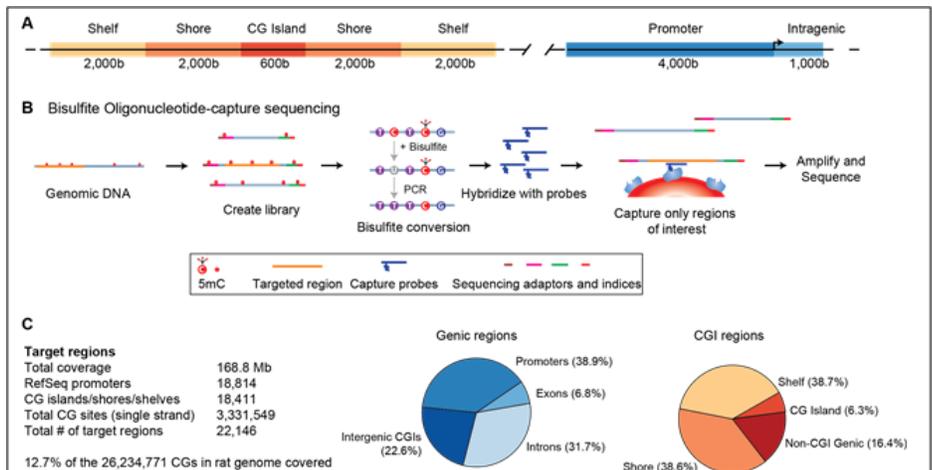
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## Research highlights

### Bisulfite oligonucleotide-capture sequencing for targeted base- and strand-specific absolute 5-methylcytosine quantitation

(Masser et al., Age. 2016 38:49)

**Dustin Masser**, a graduate student in Dr. Bill Freeman's lab, published a report on a new epigenetic analysis technology he developed – Bisulfite Oligonucleotide Capture Sequencing (BOCS). Targeting bisulfite sequencing to specific genomic regions through sequence capture with complimentary oligonucleotide probes retains the advantages of bisulfite sequencing while focusing sequencing reads on regions of interest; enables analysis of more samples by decreasing the amount of sequence required per sample; and provides base- and strand-specific absolute quantitation of CG and non-CG methylation levels.

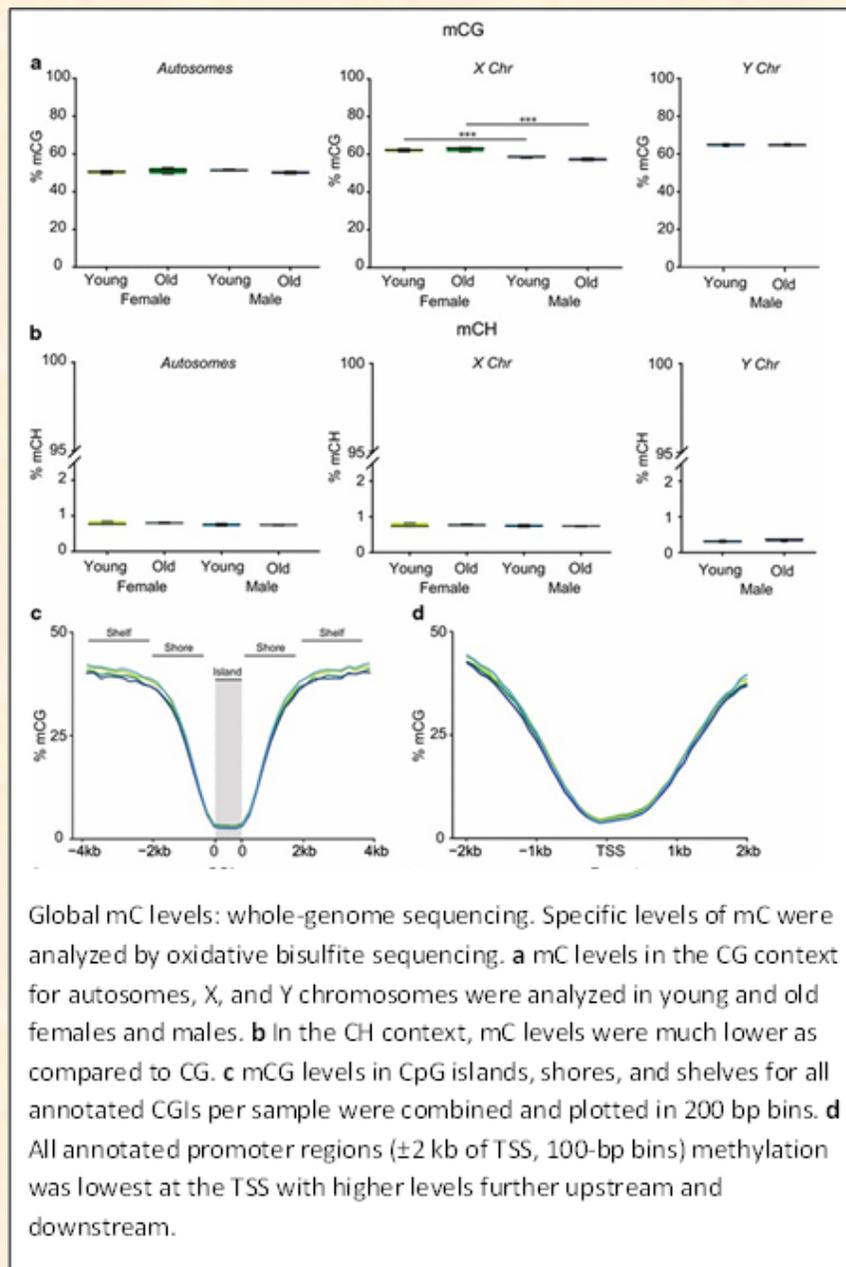


Overview of BOCS method and target regions. **a** Schematic of targeted regions. All masked CG island regions were targeted which included the CG island and flanking shores ( $\pm 2$  kb from CGI) and shelves ( $\pm 4$  kb from CGI ( $\pm 2$  kb from shores)). Targeted RefSeq promoter regions included the promoter ( $-4$  kb from transcription start site (*TSS*) and the initial intragenic region ( $+1$  kb from the *TSS*). **b** Bisulfite oligonucleotide capture sequencing workflow. Sequencing libraries are generated from genomic DNA and bisulfite converted. Converted libraries are hybridized to capture probes, and captured libraries are then amplified and sequenced. **c** Statistics for BOCS-targeted regions.

## Absence of genomic hypomethylation or regulation of cytosine-modifying enzymes with aging in male and female mice

(Epigenetics Chromatin. 2016 9:30)

[Niran Hadad](#), a graduate student in Dr. Bill Freeman's lab, published a report examining the long-standing hypothesis that the genome loses cytosine methylation with aging. Through application of a new sequencing technique he definitively showed that, in fact, this does not occur with aging in the hippocampus. This striking finding contravenes years of assumed but unproven assumptions of how the epigenome changes with aging and opens the door to a new understanding of changes to the epigenome being targeted to specific genomic loci.



## Research funding

[Dr. Raju Rajala](#) was awarded an NIH R01 grant for the period 04/01/2016 to 03/31/2021. The major goal of this project is to study the role of PI3K generated second messengers in the regulation of photoreceptor survival.

[Dr. Qing Guo](#) was awarded a Harold Hamm Diabetes Center Seed Grant. The funding period is from March 1, 2016 through August 31, 2017. This project examines an extrinsic renoprotective mechanism mediated by AATF (apoptosis antagonizing transcription factor) in diabetic kidneys.

[Dr. Qing Guo](#) was awarded a Health Research Grant from Oklahoma Center for the Advancement of Science and Technology (OCAST). The funding period is for 3 years from September 1, 2016 through August 31, 2019. This project examines how secreted AATF (apoptosis antagonizing transcription factor) participates in neuroprotection in models of brain ischemia and stroke.

## Milestones



[Dr. Beverley Greenwood-Van Meerveld](#) has been elected as the President-Elect of the American Neurogastroenterology and Motility Society. This is a 2-year term, succeeding to President. The President-Elect substitutes for the President when necessary as Chief Executive Officer of the Society, and performs all duties incident to that position including presiding over meetings of the Council. Dr. Greenwood-Van Meerveld is confident that she will continue to make important contributions to the society and help it to move forward to bigger and better contributions to the membership.

Dr. Beverley Greenwood-Van Meerveld was promoted to a **Senior VA Career Scientist**. This is a prestigious 7-year position in the VA system and was awarded to her based upon her research contributions to improving the health of our veterans. The award also recognizes her important contributions to professional societies and her outstanding abilities in training and mentoring junior investigators over many years. Last but not least, Dr. Beverley Greenwood-Van Meerveld served as the Editor of the latest edition of the Handbook of Experimental Pharmacology on Gastrointestinal Pharmacology.

**Dr. Raju Rajala** has been appointed the NIH/NEI Permanent Member of Member of Biology of Vision Study Section 07/01/2017-06/30/2021. He is also the Scientific Reviewer for Harold Hamm Diabetes Center – Seed, Training, Travel, and Equipment grants from 2016 to present. He also serves as the Scientist Reviewer for the Department of Deference Vision Research Program from February 17-18, 2016. Last but not least, Dr. Rajala serves as the Ad Hoc Reviewer at the NIH Neurobiology of Learning and Memory Study Section on March 7, 2016.

**Dr. Kennon Garrett** received the Dewayne Andrews Excellence in Teaching Award in 2016.

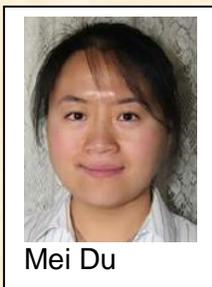
## Graduate student Accomplishments

### Ph.D. and M.S. graduations

#### Ph.D. Graduates:



- Anja Bastian (Mentor: Dr. Michael Ihnat)
- Mei Du (Mentor: Dr. Krysten Farjo)
- Qian Chen (Mentor: Dr. Jian-xing Ma)
- Xuemin He (Mentor: Dr. Jian-xing Ma)
- Chao Huang (Mentor: Dr. Xin Zhang)
- Younghwa (Henry) Shin (Mentor: Dr. Jian-xing Ma)
- Stefano Tarantini (Mentor: Dr. Zoltan Ungvari)



#### M.S. (Thesis) Graduates:

- David Deschamps, M.D. (Mentor: Dr. Dean Myers)
- Stephanie Pierce, M.D. (Mentor: Dr. Dean Myers)



# Awards Received



**Anja Bastian** (Mentor: Dr. Michael Ihnat) received the OUHSC Outstanding Multicultural Student Award in April 2016



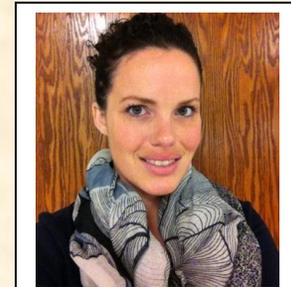
Anja Bastian



Yue Li

**Yue Li** (Mentor: Dr. Hui-Ying Lim) received the Graduate College Award for Scientific Achievement at the OUHSC GREAT Symposium

**Ashley Martin** (Mentor: Dr. Dean Myers) received the Harold Hamm Diabetes Center Training Grant for proposed research on Jan. 2017. *“Contribution of fetal epigenetic preprogramming of a hyperphagic phenotype to post-birth obesity”*



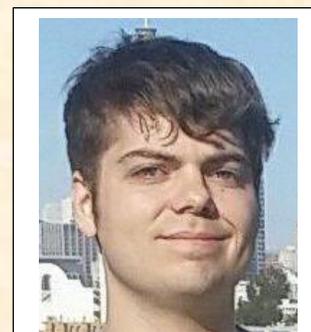
Ashley Martin

**Dustin Masser** (Mentor: Dr. Willard Freeman) received the National Eye Institute Vision Science Training Program Predoctoral Fellowship in May 2016



Dustin Masser

**Gavin Pharaoh** (Mentor: Dr. Holly Van Remmen) received the OMRP pre-doctoral scholarship Physiology Retreat Research Excellence Travel Award (best poster presentation) and the American Aging Association poster abstract travel award



Gavin Pharaoh

## New faces



Hui-Ying Lim

**Dr. Hui-Ying Lim** joined OUHSC Physiology as an Assistant Professor in June 2016. Prior, she was an Assistant Member in the Aging and Metabolism Program at the Oklahoma Medical Research Foundation (OMRF). The Lim lab studies the genetic and molecular mechanisms that govern cardiac physiology and energy metabolism.



Hong Bao

**Hong Bao** is a laboratory technician in Dr. Hui-Ying Lim's lab and she moved with the Lim lab from OMRF to OUHSC Physiology in June 2016. She has many years of experience working with *Drosophila* and currently collaborates with members in the lab on the study of various projects centering on energy metabolism and heart function.



Sima Asfa

**Sima Asfa** is a laboratory technician. She joined Dr. Qing Guo's lab in March of 2016. She is working on a project funded by Harold Hamm Diabetes Center to study the cell death mechanisms in diabetic nephropathy. She has many years of experience in working with laboratory animals and has co-authored several papers in the field using *in vitro* and *in vivo* models of diabetes.

## About the newsletter

We hope you have enjoyed reading the OUHSC Physiology newsletter. This publication is intended to share with everyone the latest events and developments within the Department. We welcome articles, thoughts and suggestions for our future issues. Please do so by emailing Dr. Hui-Ying Lim ([hlim@ouhsc.edu](mailto:hlim@ouhsc.edu)). Thank you!