Stanford Women’s Health & Sex Differences in Medicine (WHSDM) Center

Annual Seed Grant Workshop 2018

http://whsdm.stanford.edu

August 10, 2018
Stanford Women’s Health & Sex Differences in Medicine (WHSDM) Center

Marcia Stefanick, PhD
Director
Prof of Medicine, ObGyn

T.O. Preising, JD
Assistant Director, Operations

Summer 2018 Team

• Clea Sarnquist, PhD
  Co-Director, proposed new course:
  Gender & Intersectionality in Global Health (GIGH)

• Lauren Wegner (CHPR Masters student)
  • Assisting with Course Revisions

Vision: Healthy women and men - from conception through the Life Course

Mission: Advancing human health across the lifespan through research & education in women’s health, biology of sex differences, and gender medicine

http://med.stanford.edu/whsdm.html
Stanford Women’s Health & Sex Differences in Medicine (WHSDM) Center

Current Advisory Board:  Chair, Marcia Stefanick, PhD
Michele Barry, MD, FACP
Jonathan Berek, MD, MMS
Amy Braun, Doctoral Candidate
Bertha Chen, MD
Mark Cullen, MD
Mark Davis, PhD
Heidi Feldman, MD, PhD
Gabriel (Gabe) Garcia, MD
Neil Gesundheit, MD, MPH
Sabine Girod, MD, DDS, PhD
Steven Goodman, MD, MHS, PhD
Paula Hillard, MD
Andrew Hoffman, MD
Amy Ladd, MD
Mary Leonard, MD, MSCE
Yvonne (Bonnie) Maldonado, MD
Tracey McLaughlin, MD MS
Carol Muller, PhD
Douglas Owens, MD MS
Marlene Rabinovitch, MD
Natalie Rasgon, MD, PhD
Laura Roberts, MA, MD
Londa Schiebinger, MA, PhD
David Stevenson, MD
Eila Skinner, MD
Michael Snyder, PhD
Leslee Subak, MD
Jean Tang, MD, PhD
Sonoo Thadaney, MBA
Jennifer Tremmel, MD, MS
Lynn Westphal, MD
Katherine (Ellie) Williams, MD

2010-2012 Executive Steering Committee (Strategic Planning WG: 18 faculty)
Jonathan Berek (Chair), Linda Boxer, Marcia Cohen, Hugh O’Brodovich, Bobby Robbins, Laura Roberts, Linda Shortliffe, David Stevenson

http://med.stanford.edu/whsdm.html
WHSDM Educational Mission

1. Women’s Health & Sex Differences (WHSD) Application in Medical School Scholarly Concentration Program

2. WHSDM-based Medical School courses
   - Sex & Gender in Human Physiology and Disease (MED 240; HumBio140)
   - Current Topics & Controversies in Women’s Health (ObGyn 256; HumBio125)
   - Challenging Sex & Gender Dichotomies in Medicine (SomGen 150Q)
   - Health Impact of Sexual Assault & Relationship Abuse (HumBio 28; SomGen 237)
   - Sexual Function & Diversity in Medical; Queer Health (SomGen 230; INDE215)
   - Global Medical Issues affecting Women (GIGH) (SomGen 206; HumBio ?)

3. LGBTQ+ Subcommittee, SoM Diversity Cabinet

4. Medical School Curriculum, Sex & Gender, Sexuality working group

5. WHSDM Interdisciplinary Science, Education & Research (WISER)

http://med.stanford.edu/whsdm.html
First Stanford Medicine LGBTQ+ Forum

October 10th, 2018 from 4 pm – 7pm within Berg Hall.

The theme for the Stanford Medicine's First LGBTQ+ Forum is Celebrating Visibility.

Establishing visibility is critical in advancing toward an academic environment in which LGBTQ+ students, trainees, staff, faculty, and alumni are included, valued, and recognized. The Forum will feature personal and professional stories from LGBTQ+ members of the Stanford Medicine community, as well as networking opportunities and opportunities for allies to show support. This inaugural event will promote the continued growth of a visible Stanford Medicine LGBTQ+ community.

Register here, save the date, and look out for updates!

https://stanfordmedicine.qualtrics.com/jfe/form/SV_2ugfIz0IkuZge7
1. WHSDM-based Medical School (\& Undergraduate) **courses:** currently, **5** +GIGH
2. Women’s Health \& Sex Differences (WHSD) Scholarly Concentration Program
3. Sex \& Gender Minorities, Sexuality, Sex Difference Working Groups
4. Medical School Curriculum

http://med.stanford.edu/whsdm.html

WHSDM Educational Mission and Research

- WHSDM Educational Mission
- WHSDM Seed
  - **Summer Workshop:** August 10, 2018
  - Department \& Stanford Institute Representatives

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**XXXY: Sex and Gender Health Education Summit**

- **April 8-10, 2018**
- **University of Utah Health**
- **Salt Lake City, UT**

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**OSSD (Organization for the Study of Sex Differences) Annual Meeting**

- **October 18-19, 2015 at Mayo Clinic, Rochester MN**
- Department \& Stanford Institute Representatives

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**WHSDM Seed Summer Workshop:** August 10, 2018

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**Department \& Stanford Institute Representatives**
<table>
<thead>
<tr>
<th>Project Title</th>
<th>Investigators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigating sex differences in human plasma-cytoid dendritic cell function and regulation</td>
<td>Juliana Idoyaga, PhD. Assistant Prof. Microbiology &amp; Immunology Howard Chang, MD, PhD, Professor, Dermatology</td>
</tr>
<tr>
<td>Sex Differences In Hippocampal Physiology &amp; Response To Circadian Dysfunction</td>
<td>Daniel V. Madison, PhD, Assoc. Prof. Molecular &amp; Cellular Physiology H. Craig Heller, PhD Professor, Biology* Norman F. Ruby, Sr Research Scientist*</td>
</tr>
<tr>
<td>The Effect Of Sex On Differences In Treatment Strategy And Decision-Making In Patients With Inflammatory Bowel Disease</td>
<td>Cindy Kin, MD, MS, Assistant Prof. Surgery Arden Morris, MD, MPH, Prof, Surgery KT Park, MD, MS, Assistant Professor Pediatrics M. Kate Bundorf, PhD, MBA, MPH, Associate Professor Health Research &amp; Policy</td>
</tr>
</tbody>
</table>
## WHSDM Seed Grant Awards: 2017 (2)

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Investigators</th>
</tr>
</thead>
</table>
| Profiling Sex Differences in the Healthy Human Immune System Through Transcriptomics | PJ Utz, MD, PhD, Professor  
**Medicine** (Immunology & Rheumatology)  
Purvesh Khatri, Assistant Prof,  
**Biomed Data Science & Medicine** (BMR)  
Erica Bongen *(doctoral student)* |
| Leveraging Aneuploidy to Examine Sex Chromosome Effects In Neurodevelopment   | David S. Hong, MD, Assistant Prof  
**Psychiatry**  
Wing Wong, PhD, Professor  
**Statistics, Biomed Data Science**  
Alexander Urban, PhD, Assistant Prof  
**Psychiatry** |
| Sex Differences In Insulin Resistance: Probing the Contribution of Hormones to the Endothelial Dysfunction Using Stem Cell-Derived Endothelial Cell | Joshua Knowles, MD, PhD, Asst Prof.  
**Medicine** (CV)  
Patricia Nguyen MD, Assistant Professor  
**Medicine** (CV) |
## WHSDM Seed Grant Awards: 2017 (3)

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Investigators</th>
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</thead>
<tbody>
<tr>
<td>Sex Differences In The Neural Correlates of ADHD: the Role of the X-Chromosome</td>
<td>Tamar Green, MD, Instructor Psychiatry, Interdisc Brain Sciences</td>
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<tr>
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<td>Stephen Montgomery, PhD, Asst Prof. Pathology, Genetics</td>
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<tr>
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<td>Allan Reiss, MD, Professor Psychiatry, Interdisc Brain Sciences</td>
</tr>
<tr>
<td>The impact of eye disease and visual function on women’s health: defining a Women’s Health Initiative (WHI) population for study</td>
<td>Suzann Pershing, MD, MS, Asst Prof Ophthalmology</td>
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<tr>
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<td>Mark Hlatky, MD, Professor Health Research &amp; Policy, Medicine</td>
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<tr>
<td>The Sexual Dimorphism of Body Fat: Direct Genetic vs Hormonal Basis</td>
<td>Tracey McLaughlin, MD, MS. Assoc Prof Medicine (Endocrinology)</td>
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<tr>
<td></td>
<td>Bertha Chen, MD, Professor, Ob &amp; Gyn</td>
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</tbody>
</table>

http://med.stanford.edu/whsdm.html
Gender Matters
Why Sex In Science Isn't Enough

Register here. →
Agenda → [lunch will be provided]

Janine Clayton, National Institute of Health
The Power, Potential, and Promise of Considering Sex as a Biological Variable (SABV)

Huntington F. Willard, University of Chicago
Sex Differences in Biology and Medicine: A View from the X Chromosome

Marcia Stefanick, Stanford University
Why Sex & Gender Matter in Precision Health

Mark Cullen, Stanford University
Sex Differences in Mortality: Why Gender Matters

Londa Schiebinger, Stanford University
Gender Variables in Health Research

Gary Darmstadt, Stanford University
Role of Gender Norms in Developing Countries

Koret-Taube [SIEPR] Conference Center
366 Galvez Drive;
Stanford, CA 94305; USA

http://med.stanford.edu/phs.html

http://med.stanford.edu/wsdm.html
Michael Snyder, PhD
Stanford W. Ascherman, MD, FACS
Professor of Genetics
Chair, Dept. of Genetic
Stanford Medicine

Why X? SeXY Chromosomes

Basic & Translational Research Symposium
Sex Differences in Genetics
Basic & Translational Research Symposia on Sex Differences

Early Research Symposia:

2010: Beyond X & Y - with CVI, included all 5 Stanford Institutes of Medicine
Keynotes: Art Arnold, Marianne Legato, Renee Reijo Pera

2012: Molecular & Cellular Mechanisms of Heart Failure, with CVI
Vera Regitz-Zagrosek, Director, Institute of Gender in Medicine
Charité, Berlin (EUGEN)

Stanford WHSDM Center: Winter Qtr.

2013 Neuroscience

2014 Immunology, in partnership with ITI

2015 Cancer, in partnership with SCI

2016 Cardiovascular Health, in partnership with CVI

2017 Neuroscience, in partnership with Stanford Neuroscience Institute

2018 WhY X? SeXY Chromosomes, in partnership with Department of Genetics

2019 Planned Partnership: Maternal - Child Health Research Institute

http://med.stanford.edu/whsdm.html
Annual Women’s Health Forum
Stanford WHSDM Center

• 2010, 2011, 2012 (May) – Inaugural to 3rd Women’s Health @ Stanford
• 2013 - Cancer & Survivorship
  Keynote: Susan Love, MD
• 2014 - Global Women’s Health
  Keynote: Ruth Levine, PhD
• 2015 - Chronic Disease Prevention
  Keynote: Marcia Stefanick, PhD
• 2016 - Precision Health for Women, as track in Stanford Health Matters
• 2017 - Reception to Welcome Leslee Subak, M.D., Chair, Obstetrics & Gynecology
  – October: Gender Matters: Why Sex in Science isn’t Enough
    – partnered with Stanford Population Health Sciences Center
• 2018 Prioritizing Prevention in Women’s Health
  – partnered with Department of Obstetrics & Gynecology

http://med.stanford.edu/whsdm.html
Prioritizing Prevention in Women’s Health

May 9, 2018

Leslee Subak, M.D.
Katharine Dexter McCormick and Stanley McCormick Memorial Professor, Chair Obstetrics & Gynecology Stanford Medicine

Keynote
Kirsten Bibbins-Domingo
PhD, MD, MAS
Former Chair, US Preventive Services Task Force Professor and Chair, Department of Epidemiology and Biostatistics, UCSF
WHSDM Educational Mission and Research

• Basic & Translational Research Symposia on Sex Differences
• Annual Women’s Health Forum • Other (Transgender Health; Gender Matters)
• WHSD Scholarly Concentration Program; Medical School Curriculum: WHSDM-based Courses (6); Sex & Gender Minorities, Sexuality, Sex Differences Working Groups
• WHSDM Interdisciplinary Science, Education & Research (WISER) Events
  3rd Wednesday of the Month: 5:15-6:45 pm

September 19, 2018    Wednesday 5:15-6:45 pm    HRP 138B

Suzann Pershing, MD, MS, Assistant Professor, Ophthalmology
Mark Hlatky, MD, Health Research & Policy, Medicine

The impact of eye disease and visual function on women’s health:
  defining a Women’s Health Initiative (WHI) population for study

David Hong, MD Assistant Professor, Psychiatry & Behavioral Sciences
Wing Wong, PhD, Statistics, BDS; Alexander Urban, PhD, Psychiatry

Leveraging Aneuploidy To Examine Sex Chromosome Effects In Neurodevelopment

http://med.stanford.edu/whsdm.html
## 2017 WHSDM Interdisciplinary Science, Education, and Research (WISER) Events

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<tr>
<th>Month</th>
<th>Presenter</th>
<th>Presentation (Seed Grant) Title</th>
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</thead>
<tbody>
<tr>
<td>April</td>
<td><strong>Tandy Aye, MD</strong>, Pediatrics</td>
<td>Feasibility of Detecting Changes in <strong>Bone Microarchitecture</strong> and <strong>Body Composition</strong> from <strong>Cross Sex Hormone Therapy</strong> (CSHT) in Transgender Youth</td>
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<td></td>
<td><strong>Paula Hillard, MD</strong>, Ob &amp; Gyn</td>
<td><strong>Adolescent Transition</strong> from Pediatric to Adult medicine</td>
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<td>May</td>
<td><strong>Valerio Napolioni, PhD</strong></td>
<td>X-chromosome wide association study (XWAS) of Alzheimer's Disease</td>
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<td></td>
<td>Neurology &amp; Neurological Sciences</td>
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<tr>
<td>June</td>
<td><strong>Bertha Chen, MD</strong></td>
<td>Effect of <strong>cell sex</strong> on <strong>smooth muscle cells</strong> and <strong>fibroblasts</strong> derived from <strong>human embryonic stem cells</strong></td>
</tr>
<tr>
<td></td>
<td>Obstetrics &amp; Gynecology</td>
<td>Sex Differences in Macrophage Activation: Role of miR-204</td>
</tr>
<tr>
<td></td>
<td><strong>Philip Tsao, PhD</strong></td>
<td><strong>Effect of cell sex on smooth muscle cells and fibroblasts derived from human embryonic stem cells</strong></td>
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<tr>
<td></td>
<td>Medicine (CV)</td>
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<tr>
<td>Oct.</td>
<td><strong>Luis de Lecea, PhD</strong></td>
<td><strong>Androgen Signaling in Alcohol-Seeking Behavior between Genders</strong></td>
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<td>Psychiatry</td>
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<tr>
<td></td>
<td><strong>Patricia Nguyen</strong></td>
<td>Global Gene Expression Profiling of the Effects of <strong>Estrogen and Testosterone</strong> on <strong>Human Cardiomyocytes</strong> Derived from <strong>Induced Pluripotent Stem Cells</strong></td>
</tr>
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<td>CVI, Medicine</td>
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<tr>
<td>Dec.</td>
<td><strong>Maya Kumar, PhD</strong></td>
<td>Defining the <strong>Molecular Pathways</strong> Responsible for <strong>Female-biased Airway Disregulation in Chronic Asthma Strategy</strong> &amp; Decision-Making In Patients with <strong>Inflammatory Bowel Disease</strong></td>
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<tr>
<td></td>
<td>Medicine (Pulmonary &amp; Critical Care)</td>
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</table>
| January | Tracey McLaughlin, MD, MS  
Professor, Medicine (Endocrinology) | Sex differences in adipocyte responses to experimentally-induced weight gain |
| March | Amy Braun, PhD (Theo Palmer lab)  
Postdoctoral Fellow, Winn lab | Examining Sex Differences in the Human and Mouse Placental Transcriptome During a Vulnerable Neurodevelopmental Window |
| May | Erika Bongen, Emily Flynn, and Kelly McGill (Doctoral Students) | From Genome to Epigenome: Understanding Sex Differences at Different Layers of Genetic Regulation |
| June | Dan Madison, Craig Heller, Norman Ruby  
Ilanit Itzhaki | Sex Differences In Hippocampal Physiology & Response To Circadian Dysfunction  
The Effect of Estrogen on Cardiac Arrhythmic Propensity |
| July | Tamar Green, Allan Reiss  
Cindy Kin, KT Park, Arden Morris | Sex Differences In The Neural Correlates of ADHD: the Role of the X-Chromosome  
The Effect Of Sex On Differences In Treatment Strategy And Decision-Making In Patients With Inflammatory Bowel Disease |

http://med.stanford.edu/whsdm.html
Stanford Women’s Health & Sex Differences in Medicine (WHSDM) Center

Annual Seed Grant Workshop 2018
Departments
Institutes of Medicine

Basic Science Departments (12)
- Biochemistry
- Bioengineering
- Biomedical Data Sciences
- Chemical & Systems Biology
- Comparative Medicine
- Developmental Biology
- Genetics
- Health Research & Policy
- Microbiology & Immunology
- Molecular and Cellular Physiology
- Neurobiology
- Structural Biology

Clinical Science Departments (18)
- Anesthesiology, Perioperative & Pain Medicine
- Cardiothoracic Surgery
- Dermatology
- Emergency Medicine
- Medicine
- Neurology & Neurological Sciences
- Neurosurgery
- Obstetrics & Gynecology
- Ophthalmology
- Orthopaedic Surgery
- Otolaryngology
- Pathology
- Pediatrics
- Psychiatry & Behavioral Sciences
- Radiation Oncology
- Radiology
- Surgery
- Urology

Stanford Cancer Institute (SCI)
Stanford Cardiovascular Institute (CVI)
Institute for Immunity, Transplantation and Infection (ITI)
Institute for Stem Cell Biology and Regenerative Medicine (ISCBRM)

Stanford Neurosciences Institute (SNI)
Clinical Science: Anesthesiology, Perioperative and Pain Medicine

Department Chair: Ronald G. Pearl, MD, PhD
• Dept. Chair-design. WHSDM Representative: Pamela Flood, MD, MA

Basic Science
• Eric Gross: Mechanisms underlying endometriosis and its treatment in rodent models
• Creed Stary, Rhona Giffard: Mechanisms underlying cerebral ischemia specific to female mice
• Martin Angst, Brice Gaudilliere, Kaz Ando: Immune clock of pregnancy
• David Clark, Vivianne Tawfik, Chinwee Nwaneshiudu: Sex differences in Immune contributions to pain after injury in rodents

http://med.stanford.edu/anesthesia.html
Translational Science

- **Sean Mackey**: sex/gender differences for the effect of opioids on baseline brain structure
- **Gary Peltz, Brendan Carvahlo, David Drover**: Pharmacokinetic and pharmacodynamic changes in pregnancy
- **Jiang-Ti Kong**: Sex differences in quantitative sensory testing

Data Science

- **Pamela Flood**: Identification of factors predicting pain and poor recovery after childbirth, Outcome after dural puncture, Factors related to maternal satisfaction with care, sex differences in faculty assignment and burnout
- **Beth Darnall**: sex differences in pain catastrophizing, factors that differ between men and women in chronic pain
- **Alex Butwick**: Hemorrhage after childbirth

http://med.stanford.edu/anesthesia.html
Clinical Trials

• Pamela Flood and Brendan Carvahlo: Gabapentin and opioid cessation in high risk parturients
• Beth Darnall, Maisa Ziadni: My Surgical Success—psychological intervention and recovery after breast surgery
• Ed Riley: Process change in labor and delivery
• Clemens Ortner: Total body ultrasound evaluation in parturients

Other

• Jody Leng: Maternity leave and breast feeding during residency
• Alyssa Burgart: Ethics of hysterectomy in minors
• Gill Abir and Naola Austin: Simulation for preparedness in labor and delivery
Basic Science: **Biochemistry**

**Department Chair:** Suzanne Pfeffer

- Dept. Chair-designated **WHSDM Representative:** TBD

**Mission:**

**Research:** molecular analysis of fundamental biological questions

**LABS:**
- Artandi (telomeres)
- Brandman (stress signaling)
- Brown (posttranscriptional regulation)
- Beachy (Hedgehog proteins)
- Chu (damaged DNA)
- Das (RNA folding)
- Davis (whole genome analysis)
- Ferrell (cell cycle)
- Harbury (molecular evolution)
- Herschlag (macromolecules)
- Krasnow (respiration & lung development)
- Pfeffer (protein-targeting & cholesterol)
- Rohatgi (signaling)
- Salzman (circular RNAs in cancer)
- Spudich (cell motility)
- Straight (chromosome segregation)
- Theriot (cell motility)
- Yeh (apicoplast)

**Education:** research intensive Ph.D. with teaching experience

and outstanding **Emeriti Faculty**
Basic Science: Bioengineering

Department Chair: Norbert Pelc

• Dept. Chair-designated WHSDM Representative: Russ Altman, MD, PhD

Dr. Russ Altman
• WHSDM Seed Grant - Developing a Robust Baseline for Menstrual Cycle Gene Expression Variability
• Examination of sex-differential effects in normal tissue & drug response expression data

Dr. Stephen Quake
• Non-invasive diagnosis of fetal aneuploidy in maternal blood
• Single cell RNA-seq to examine changes in human endometrium throughout the menstrual cycle

Dr. David Camarillo
• Method for examining egg health: Found that mechanical consistency of eggs can help predict quality
• Will inform need for more egg collection cycles, which are expensive and invasive

Dr. Jennifer Cochran
• Engineered a protein that interferes with breast and ovarian cancer signaling

Dr. Alison Lesley Marsden
• Fetal / developmental congenital heart disease

http://bioengineering.stanford.edu
Women are often excluded because of concerns about menstrual cycle variability.

Menstrual cycle effects in the endometrium have been studied extensively with microarray.

PROBLEM: limited molecular level data outside the uterus.

GOAL: gather menstrual cycle expression data from peripheral blood.

Welt, CK. Physiology of the normal menstrual cycle.

http://bioengineering.stanford.edu
Altman, Lathi, Flynn, McGill (WHSDM Seed Grant)

Analysis plan

1. Run expression analysis on 10 samples at three time points

2. Assess extent to which expression data explains phase
   a) Variance Analysis
   b) Sample clustering

3. Relate changes in expression to biological function
   a) Relationship to Hormones
   \[ gene_i \sim \beta_1 E + \beta_2 P + \beta_3 subject_j + \epsilon \]
   b) Pathway Analysis

4. Develop gene signatures to identify phase, and apply to vaccination data
   Gene signatures
   Unlabeled sample

2) Label phase in microarray flu vaccine data
   3) Examine effects of vaccination timing

http://bioengineering.stanford.edu
Assessment of sample quality

1. Set up a collaboration with the NIH BioCycle project to obtain samples
   • 259 women, 2 cycles, 8 time points
   • Extensive lab test metadata
2. Selected BioCycle samples based on aligning hormone levels, filtered based on LH peak
3. Ran RNA extraction and quality assessment – unfortunately samples are insufficient quality
4. Next steps: collect samples, run expression analysis
   • Will combine with BioCycle metadata in analysis
   • Use BioCycle samples for validation

http://bioengineering.stanford.edu
Examination of sex-differential effects in tissue and drug response expression data

Dr. Russ Altman MD/PhD, Emily Flynn

http://bioengineering.stanford.edu

www.eupati.eu
Meta-analysis of liver expression identifies sex differences genes involved in drug response

Dr. Russ Altman MD/PhD, Emily Flynn

<table>
<thead>
<tr>
<th>Gene</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYP3A4</td>
<td>-0.48</td>
</tr>
</tbody>
</table>

Higher in females

Higher in males

[Image of heatmap with gene expression data]

http://bioengineering.stanford.edu
Validating a risk heuristic for spontaneous preterm birth

Accurate prediction of spontaneous preterm birth up to 2 months in advance of delivery

* P < 0.05, ** P < 0.01, *** P < 0.0005 (Fisher’s exact test)

Science (2018)

http://bioengineering.stanford.edu
Basic Science: Biomedical Data Science

Department Chair: Carlos Bustamante

• Dept. Chair-designated WHSDM Representative: Wing Wong, PhD

Evolution of Y chromosome - Carlos Bustamante

http://med.stanford.edu/dbds.html
Sex Differences in Cancer – 2015

- Updates on Male Breast Cancer—Mark Pegram, MD (Medicine - Oncology)
- Effects of Parathyroid Hormone on Male and Female Skeletal Metastases—Joy Wu, MD, PhD (Medicine - Endocrinology)
- What’s Driving Worse Survival for Melanoma in Men?—John Sunwoo, MD (Otolaryngology)
- Sex Differences in Melanoma Survival—Susan Swetter, MD (Medicine - Oncology)

- Sex Differences in Lung Cancer in the Era of Targeted Therapy—Heather Wakelee, MD (Medicine - Oncology)
- Sex Differences in Liver Cancer and Chronic Hepatitis B—Mindie Nguyen, MD, MAS (Medicine - Gastroenterology & Hepatology)
- Epidemiology of Papillary Thyroid Cancer and Quandary of Active Surveillance—Chris Holsinger, MD (Otolaryngology)

- Breast Cancer (WHI project) - Allison Kurian, MD (Medicine – Oncology)

Videos for all talks are on WHSDM website http://whsdm.stanford.edu
http://med.stanford.edu/cancer.html
Clinical Science: Cardiothoracic Surgery

Department Chair: Joseph Woo MD

• WHSDM Representative: Ngan F. Huang, PhD, Assistant Professor

Research: dedicated to the principles of vision, perseverance, and rigorous scientific investigation and a commitment to conduct well-conceived, cutting-edge research

Education: programs focus on the evolution of cardiothoracic surgery; recognized leaders in the education of cardiothoracic surgical residents and fellows

Divisions:

• Adult Cardiac Surgery – record of ≥30,000 cardiac procedures
• Thoracic Surgery – patients with lung cancer, emphysema, esophageal CA
• Pediatric Cardiac Surgery – improved survival from lethal cardiac malformations

http://med.stanford.edu/ctsurgery.html
Cardiothoracic Surgery: Research Laboratories

**Advanced Therapeutics for Heart Failure**
Dr. Joseph Woo
- Angiogenic tissue engineering, myocardial regeneration, circumventing ischemia with endosymbiotic relationships

**Cardiothoracic Therapeutics and Surgery Laboratory**
Dr. William Hiesinger's
- Uses protein therapeutics, heart computer modeling and simulations, 3-D printed vessels, and cardiovascular biodevices to tackle a variety of CV challenges

**Thoracic Surgery Laboratories (2)**
Dr. Joseph Shrager
- Non-small cell lung carcinoma and mesothelioma
- Respiratory Muscle research

**Stanford Cardiovascular Tissue Engineering Laboratory**
Dr. Ngan Huang's Laboratory
- Stem cell differentiation and mechanobiology
- 3D engineered cardiovascular tissues
- Develop microscale devices for studying cell function

**Thoracic Aortic Research Laboratory**
Dr. Michael Fischbein
- Genomic and transcriptomic analyses of aortic aneurysms in Marfan Syndrome
- In vitro disease models of Marfan Syndrome using primary culture cells and inducible pluripotent stem cells

**Clinical and Translational Research Program**
Betty Irene Moore Children's Heart Center
- designed to meet the evolving needs of the patient community and to act as the platform for the Heart Center to assume a leading national and international role in advancing the field

**Cardiac Surgical Arrhythmia Research Laboratory**
Dr. Anson Lee
- Understanding mechanisms of atrial fibrillation and develop potential therapies to treat atrial fibrillation and other forms of tachycardia

**Stanford Cardiovascular Institute**
- The nucleus for cardiovascular research at Stanford University is home to Stanford's myriad cardiovascular-related adult and pediatric research, clinical, and educational programs, centers and laboratories, as well as over 500 Stanford basic scientists, graduate students, clinician scientists and other researchers in heart and vessel disease and

http://med.stanford.edu/ctsurgery.html
CURRENT PROJECTS

THORACIC:

• Exploration of hormonal status and hormone replacement therapy on the development and outcomes of lung cancer in women (Backhus)
• Creation of the National Lung Cancer Roundtable with appointment of Dr. Leah Backhus as Chair of the Women and Lung Cancer Task Group. Goals:
  • To acknowledge that lung cancer is a women’s health imperative
  • To acknowledge that there is a disparate impact of lung cancer on women and in particular, on women who have never smoked
  • To explore strategies to mitigate factors contributing to disparities across the continuum of prevention (potential opportunity to interact with other groups) screening, treatment and survivorship care for women with lung cancer.

CARDIAC:

• WSDM-Funded Seed Grant: Effects of sex hormones on endothelial cell phenotype and dysfunction towards developing new approaches to angiogenesis in cardiovascular tissues (Huang)
• Project looking at mechanisms of sex differences of aneurysm formation in Marfan syndrome (Fischbein)

http://med.stanford.edu/cturgery.html
WHSDM-Funded Project (Huang Lab): Female HCAECs Induce More Angiogenesis in Male Mice than Male Cells: SQ Matrigel Plug assay

Female (32yr) HCAECs Induce More Angiogenesis than Male (30yr) HCAECs

Murine Capillary Density

Human Capillary Density

Fold change

Female HCAECs | Male HCAECs
---|---
150 | 0
100 | 0
50 | 0
0 | 0
FUTURE PROJECTS:

• Induced pluripotent stem cell-derived endothelial cells for studying sex differences in endothelial dysfunction associated with sleep apnea (Huang)
• The role of sex in nicotine-induced vascular dysfunction (Huang)
• Gender differences in physical and mental rehabilitation outcomes following CABG procedures (Boyd)
• Understanding the anatomic differences of coronary disease (SYNTAX scores) between the sexes following surgical treatment within the defined terciles between the sexes (Boyd)

http://med.stanford.edu/ctsurgery.html
CVI Director: Joseph Wu, MD, PhD

- Director-designated WHSDM Representative:
  - Latha Palaniappan, MD, MS, Professor, Medicine (CV Med)
  - Patricia Nguyen, MD, Assistant Professor, Medicine (CV Med)

- Role of Gender in Drug Induced Arrhythmia – Marc Mercola, PhD
- The WHI Strong and Healthy SilenT Atrial Fibrillation Recording Study (WHISH STAR) – Marco Perez, MD
- Sex differences in AAA development – role of inflammation – Phil Tsao, PhD
- Estrogen - A Friend or Foe in Viral Cardiomyopathy? - Sean Wu, MD, MPH
- Global Gene Expression Profiling of the Effects of Estrogen and Testosterone on Human Cardiomyocytes Derived from Induced Pluripotent Stem Cells
  - Patricia Nguyen, MD and Joseph Wu, MD, PhD
- Diet Intervention Examining The Factors Interacting with Treatment Success (Sub-analysis for Sex Differences) – Chris Gardner
CVI Director: Joseph Wu, MD, PhD

- Director-designated WHSDM Representative:
  - Latha Palaniappan, MD, MS, Professor, Medicine (CV Med)
  - Patricia Nguyen, MD, Assistant Professor, Medicine (CV Med)

- Sex Differences in Myocardial Perfusion (Sub-analysis for Clinical Trials) – Koen Nieman, MD
- Identifying Transcriptomic and Epigenomic Differences between Female hiPSCs Generated by Different Reprogramming Methods) – Joseph Wu, MD, Ph

**Mintu Turakhia, MD – WHSDM-relevant Research Program**

- Underreporting of sex differences in outcomes of catheter ablation of atrial fibrillation- Meta-analysis (Fahd Yunus, resident; Alex Perino, fellow)
- Treatment and outcomes of atrial fibrillation in pregnancy
- National data taken from > 1 million AF patients (Fahd Yunus, resident)
- Anticoagulation nonprescription in women and risk of stroke (Celina Yong)
- Sex differences in bleeding with double and triple anticoagulation-antiplate therapy after PCI (Celina Yong)
Department Chair: James Chen

- Dept. Chair-designated **WSDM Representative**: Mary Teruel

**Mission:**
- to understand complex biological processes at molecular and systems level
- interdisciplinary research spans biological & physical sciences

**Research:** signal transduction, chromatin remodeling, cell cycle regulation/differentiation, protein homeostatis, genomic stability
- by integrating genetic technologies, biochemical and chemical tools, quantitative analysis, and computational models, this research deconstructs cellular systems, predicts emergent behaviors, translates to new therapies

http://chemsysbio.stanford.edu
How can low rates of adipogenesis be maintained despite daily oscillations and healthy, but unpredictable, spikes in glucocorticoid levels?

And why is losing pulsatility in glucocorticoid secretion so closely linked with obesity?
Flattening circadian glucocorticoid oscillations in mice resulted in significantly increased body weight.

Implanted corticosterone wax pellets were used to continuously flatten circulating levels.
However, increasing glucocorticoid peak amplitudes even 40-fold had no effect on body weight!

Corticosterone was injected daily at 5PM to increase daily peak levels.
Fat mass doubled in mice when circadian glucocorticoid oscillations were flattened for 21 days

The increase in fat mass is due to both increased cell volume and adipogenesis.
A general temporal control principle for cell differentiation, as well as a new therapeutic strategy to reduce fat mass?

Bahrami-Nejad,...,Teruel, Cell Metabolism, April 2018.
An essential role for HIPK4 in mammalian spermatogenesis

James K. Chen
Chemical and Systems Biology
Developmental Biology
Chemistry (by courtesy)
HIPK4 is essential for male fertility

![Image of rats]

- **Hipk4:**
  - Male: +/−, −/−
  - Female: +/+ +/+
HIPK4-deficient sperm are incompetent for IVF but can fertilize oocytes through ICSI.

<table>
<thead>
<tr>
<th>Fertilization method (Hipk4 genotype)</th>
<th>Oocyte number</th>
<th>Fertilization (2-cell)</th>
<th>Embryogenesis (morula and blastocyst)</th>
<th>Pups</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVF (-/-)</td>
<td>69</td>
<td>0</td>
<td>0</td>
<td>ND</td>
</tr>
<tr>
<td>ICSI (-/-)</td>
<td>37</td>
<td>19 (51%)</td>
<td>14 (38%)</td>
<td>ND</td>
</tr>
<tr>
<td>ICSI (-/-)</td>
<td>37</td>
<td>32 (86%)</td>
<td>ND (implanted)</td>
<td>4 (11%)</td>
</tr>
<tr>
<td>IVF (+/+)</td>
<td>&gt;1000</td>
<td>94%</td>
<td>ND</td>
<td>ND</td>
</tr>
<tr>
<td>ICSI (+/+)</td>
<td>&gt;1000</td>
<td>50-70%</td>
<td>30-50%</td>
<td>10-15%</td>
</tr>
</tbody>
</table>
HIPK4-deficient sperm have misshappen heads

Hipk4\(^{+/+}\)  

<table>
<thead>
<tr>
<th>DAPI</th>
<th>FITC-PNA</th>
</tr>
</thead>
</table>

Hipk4\(^{-/-}\)  

Scale bars: 5 μm

SEM  

Scale bars: 1 μm

Aaron Crapster and Zane Hellman
Basic Science: Comparative Medicine

Department Chair: Sherril Green

• Dept. Chair-designated **WHSDM Representative:** Joseph Garner, D. Phil.
  – Associate Professor, Comparative Medicine; by courtesy, Psychiatry & Behavioral Sciences

In addition to research and teaching missions, our MCL faculty provide services to support basic and translational research, both as paid service and as collaborative research agreements. [http://med.stanford.edu/vsc.html](http://med.stanford.edu/vsc.html)

1. **Technique Refinement and Innovation Lab**
   • Biostatistics service (can consult on experimental designs to include males and females without increased sample size)
   • Mouse breeding and colony management services

2. **Histology Lab**
   • Pathology, Necropsy, & Histology Services.

3. **Diagnostic Lab**
   • Chemistry & Physiology, Serology, IHC, PCR, etc.

4. **Pre-APLAC Veterinary Consultation for Protocol Development**
Basic Science: Comparative Medicine

Kerriann Casey, DVM (DACVP), Assistant Professor.
- WHSDM Collaboration: Looking for opportunities to collaborate and provide histopathologic support in radiation oncology and cancer biology, as the pertain to ovarian and breast cancer.

Thomas L. Cherpes, MD/DVM, Assistant Professor.
- WHSDM Research: Immune mechanisms of the female reproductive tract, basic & translational in mice and humans.
  - Hormonal contraception and increased HIV susceptibility.
  - Type 2 immune defense against Chlamydia trachomatis.

Joseph Garner, D.Phil, Associate Professor.
- WHSDM Research: Sex-biased disorders (trichotillomania, compulsive skin picking, autism), Health delivery disparities.
- WHSDM Collaboration: Biostatistics for personalized medicine, and sex or gender based research in animal and human trials.
Clinical Science: Dermatology

Department Chair: Paul Khavari, MD
• Dept. Chair-design. WSDM Representative: Jean Tang, MD, PhD

Women’s Health:
• Women’s Health Initiative (WHI) melanoma and NMSC analyses
• Jean Tang (with M Stefanick): ~10 manuscripts
• Kathryn Martires – pregnancy and skin

Sex Differences:
Susan Swetter, John Sunwoo (ENT), Kevin Wang

Melanoma survival: White males do worse [Deaths: 1.55 (1.39-1.73)] than females within each age range assessed (e.g., 15-24, 25-29, 30-34, 35-39 years).

*JAMA Dermatol.* 2013

http://dermatology.stanford.edu
Basic Science: Developmental Biology

Department Chair: Roeland Nusse

- Dept. Chair-design. **WSDM Representative:** Anne Villeneuve, PhD
  - American Cancer Society Research Professor of Developmental Biology and of Genetics

**Mission:** Research & Education

- molecular mechanisms that generate and maintain diverse cell types in many contexts, e.g. embryo, various adult organs, evolution of species

**Research – Disease Mechanisms & Faculty Interest Areas**

- Cancer
- Stem Cells
- Downs’ Syndrome
- Multiple Sclerosis
- Diabetes
- Allergy & Asthma
- Birth Defects
- Antibiotic Design
- Bone fracture/Osteoporosis
- Brain, CV, Lung, and Skeletal Development
- Immunodeficiency & Autoimmune Disease
- Neural degeneration/regeneration
- Arthritis
- Glaucoma

**Education:** Graduate/PhD Program, Undergrads, Medical Students, Post-Docs

http://devbio.stanford.edu
Basic Science: Developmental Biology

Minx Fuller –
Sex-specific gene expression and cell division programs in germ cells

Anne Villeneuve –
Chromosome dynamics during sexual reproduction, including differences between male and female meiosis

Seung Kim –
Mouse model for gestational diabetes
Clinical Science: Emergency Medicine

Welcome Our New Department Chair: Andra Blomkalns, MD, MBA

Starts September 15th

Focus: Technology development & medical device innovation

Prior research: Aortic aneurysm formation, ACS, obesity

Research with a gender lens: crisis support systems for gender-based violence in India; gender-specific differences in EMS utilization/care/outcomes; women in the EMS workforce and leadership; economic empowerment of female community healthcare workers via acute care skills training

Other research with potential for gender and sex differences investigations: health care delivery for pediatric/cardiac/trauma patients, renal function in endurance athletes, sleep deprivation and physician performance

Specialized programs: biosecurity, critical care medicine, disaster medicine, EMS, global health, medical humanities, simulation, social emergency medicine, ultrasound, wilderness medicine.
Genetics is a fundamental and important discipline to examine underlying mechanisms of biology and medicine with the goal of improved understanding of biology and treatment of human disease. Advances in both technology development and biological understanding are emphasized.

Our Mission is excellence in research and education

PhD Program; Post-docs; Human Genome Center; Diversity outreach
Department Chair: Michael Snyder

- Dept. Chair-design. **WHSDM Representative:** Julie Baker, PhD
  - Associate Professor of Genetics

**Mike Snyder:** male & female metabolomic, methyome, proteome, genome.

**Julie Baker:** Placentation

**Anne Brunet:** Aging in males and females

**Doug Vollrath:** Retinal biology

**Jonathan Prichard:** Evolution and human disease.

**Carlos Bustamante:** Y chromosome evolution; population genetics

**Polly Fordyce:** Proteases and Pregnancy

**Ami Bhatt:** Microbiome and disease

**Billy Li:** RNA editing sex specific

[http://genetics.stanford.edu](http://genetics.stanford.edu)
Basic Science: Health Research & Policy

Department Chair: Laurence Baker, PhD

• Dept. Chair-design. WHSDM Representative: Julia Simard, ScD, Assistant Professor, HRP (Epidemiology); by courtesy, Medicine (Immunology & Rheumatology)

Research:

Epidemiology - ID, neuro, cardiovascular, musculoskeletal, autoimmune, aging cancer, and epidemiologic methods, as well as aspects of genetic epidemiology, reproductive epidemiology and women's health

Health Services Research - analysis of effects of financial incentives, organizational structures & government policies on health care delivery system

Education: Master’s of Science: Epidemiology & Clinical Research; Health Policy; PhD in Epidemiology & Clinical Research; Health Policy; Co-term Epi&CR

HRP faculty also involved in a number of dual degree programs

http://med.stanford.edu/hrp.html
Julia Simard (Epi): reproductive outcomes in the setting of chronic autoimmune disease in men and women; leave policies, burnout, and women in academic medicine

Victor Henderson (Epi): how does sex or gender modify manifestations of, and risks for, midlife and late life cognitive disorders?

Allison Kurian (Epi): improve the outcomes of women's cancers through clinically-oriented research on genetic risk assessment, risk-adapted screening and prevention

Lola Falasinnu (Epi): gender differences in diagnosis of lupus and future comorbidities and survival

Maya Rossin-Slater (HSR): family leave policies and implications

Mark Hlatky (HSR): cost of care and repeat cardiac events, atrial fibrillation, preeclampsia and cardiovascular disease; WHI and WHISH trial

http://med.stanford.edu/hrp.html
Clinical Science: Medicine

Department Chair: Robert Harrington, MD

• Dept. Chair-design. WSDM Representatives:
  • Tracey McLaughlin, MD, Associate Professor, Medicine (Endocrinology),
  • Several CV- and Cancer- focused Faculty (presented earlier in workshop)
  • Marcia Stefanick, PhD, Professor, Medicine (SPRC)

Divisions

• Biomedical Informatics
• Blood & Marrow Transplantation
• Cardiovascular Medicine
• Endocrinology, Gerontology & Metabolism
• Gastroenterology & Hepatology
• General Medical Disciplines
• Hospital Medicine
• Hematology
• Immunology & Rheumatology
• Infectious Diseases
• Nephrology
• Oncology
• Primary Care & Outcomes Research
• Pulmonary & Critical Care Medicine
• Stanford Prevention Research Center

http://medicine.stanford.edu
Department Chair: Robert Harrington, MD

**Themistocles (Tim) Assimes, MD – WHSDM-relevant Research Program**

- Whole Genome Sequence Analysis of Ischemic Stroke in the Women’s Health Initiative
- A Mendelian Randomization study of breast feeding duration and the risk of adverse cardiometabolic traits and outcomes
- Large-scale common variant association analysis of atherosclerotic CVD outcomes - WHI
- Premorbid predictors of death from the initial presentation of coronary heart disease in post-2 menopausal women
- Trans-ethnic epigenome-wide association study of lipids
- Unbiased estimate of heritability of CAD before and after adjustment for risk factors in prospective NHLBI cohorts
- Examination of associations between age at natural menopause and age related health outcomes in the WHI using the principle of Mendelian Randomization
- DXA versus Anthropomorphic Measures of Adiposity as a Predictor of Cardiovascular Outcomes in postmenopausal women: The Women's Health Initiative DXA Cohort

[http://med.stanford.edu/cvi.html](http://med.stanford.edu/cvi.html)
• **Sex differences in coronary pathophysiology** (endothelial dysfunction, microvascular disease, and myocardial bridging in patients with chest pain, but normal coronary arteries) **Jennifer Tremmel, MD, MS**

• **Radial vs. femoral PCI** in women (sex differences in bleeding, FFR, early MI)

• **Sex differences in perceived barriers to cardiac rehabilitation** (**Valerie Hoover**)

### Potential Collaborators

Abha Khandelwal, MD, MS  
Jennifer Tremmel, MD  
Sandra Tsai, MD, MPH  
Eleanor Levin, MD  
Mary Nejedly, NP  
Eryn Bryant NP  
Valerie Hoover, PhD  
Katie Janasek NP

**Mission:** Through the prevention, diagnosis, and treatment of cardiovascular disease and its impact on psychosocial well-being, Stanford Women's Heart Health provides comprehensive cardiovascular care to women across their lifespan utilizing an evidence-based, personalized, multidisciplinary approach.
WSDM Basic & Translational Research Symposium: Sex Differences in Cardiovascular Health - 2016

- Male vs. Female Human Fetal Amniotic Mesenchymal Stem Cells: Immunoprivilege, Cardiac Differentiation, and Regenerative Capability - Phillip C. Yang, MD
- Gender Differences in Quality and Outcomes of Care of Atrial Fibrillation - Mintu Turakhia, MD
- Estrogen - A Friend or Foe in Viral Cardiomyopathy? Sean Wu, MD, MPH
- Angina in Absence of Obstructive Coronary Artery Disease: Is There Truly a Sex Difference? - Jennifer Tremmel, MD, MS
- Sex Differences in Genetic Determinants of Extreme Cardiopulmonary Fitness --Matthew Wheeler, MD
- Sex Differences in Myocardial Gene Expression Patricia Nguyen, MD
- Transcatheter Aortic Valve Replacement William Fearon, MD

Videos for all talks are on WSDM website http://whsdm.stanford.edu http://med.stanford.edu/cvi.html
• Defining optimal TG/HDL-C cutpoint for identification of insulin resistance in premenopausal women and women with PCOS (McLaughlin, Popat)

• Differences in gene expression in adipose tissue related to insulin resistance and weight gain in men, premenopausal women, and postmenopausal women (WHSDM-supported) (McLaughlin, Snyder)

• Impact of menopause on regional distribution of fat and adipose cell size in response to dietary weight gain (WSDM-supported) (McLaughlin, Cushman)

Swati Achary, PhD. Basic Life Science Research Associate
Working on T cells and Asthma using multiples comics platforms to understand molecular and mechanistic differences in clinical samples from discordant twins, as well as concordant twins and singles with Asthma; has age matched genders included in experimental design to understand gender differences in disease etiology

http://endocrinology.stanford.edu/
Clinical Science: **Medicine** (Endocrinology)

Department Chair: Robert Harrington, MD  
Debt. Chair-designated **WHSDM** Representative: Tracey McLaughlin, MD  
Associate Professor, Medicine (Endocrinology)

- **Andrew Hoffman,** MD, Professor, Medicine (Endocrinology)  
  - **Hormones in a Performance-Enhanced Society**  
    [MED71N]: Anabolic Hormones & Growth Hormone

- **Jennifer Shuwan Lee,** MD, Associate Professor, Medicine (Endocrinology)  
  - **Epidemiologic studies on sex differences in risks for cardiometabolic disorders**

- **Joy Wu,** MD, Associate Professor, Medicine (Endocrinology)  
  - **Sex effects on osteoblasts/hematopoietic cells** in bone

Clinical Science: Medicine (PCPH)

Department Chair: Robert Harrington, MD
Dept Representative: Latha Palaniappan, MD, MS, Professor, Medicine (SPRC)

Primary Care Population Health

- Sex differences in Diabetes and Cardiovascular disease in Asian American subgroups – Latha Palaniappan, MD, MS
- Deployment and Preterm Birth Among US Army Soldiers – Lianne Kurina, PhD and Jonathan Shaw, MD
- Long-Acting Reversible Contraceptive Placement Among Active-Duty U.S. Army Servicewomen – Lianne Kurina, PhD and Jonathan Shaw, MD
- Sexual and Gender Medicine Service in collaboration with OB/GYN Department – Benjamin Laniakea, MD, Meghan Mahoney, MD, and Leslee Subak, MD
Clinical Science: Medicine (PCPH)

Department Chair: Robert Harrington, MD
Dept Representative: Latha Palaniappan, MD, MS, Professor, Medicine (SPRC)

Primary Care Population Health

- Pregnancy Outcomes in Veterans (PROVE)
  - Ciaran Phibbs, PhD and Jonathan Shaw, MD

- Prevalence of Pelvic Floor Disorders in US Army Female Soldiers
  - Lisa Rogo-Gupta, MD, Lianne Kurina, PhD, and Jonathan Shaw, MD

- Lost to Care: Attrition of Women Veterans New to VA
  - Susan Frayne, MD, MPH

- VA Women’s Health Practice-Based Research Network
  - Susan Frayne, MD, MPH

- VA Women’s Health Initiative – Susan Frayne, MD, MPH
Clinical Science: **Medicine** *(SPRC)*

**Department Chair:** Robert Harrington, MD  
**WHSDM Representative:** Marcia Stefanick, PhD, *Professor, Medicine (SPRC)*

[Image of Women's Health Initiative (WHI) map]

https://www.whi.org/

**Mr. OS**  
Study of Osteoporotic Fractures in Men (MrOS) and MrOS Sleep

**WHISH**  
Women’s Health Initiative Strong & Healthy (WHISH) Physical Activity Intervention Trial

**WHI Components**  
- HT: 27,347  
- CaD: 36,282  
- Diet: 48,835  
- CT = 68,132

**3 Controlled Trials**

**Observational Study**

**WHI Extension Study**

[Image of Stanford Women's Health & Sex Differences in Medicine logo]
Mission

**Research:** *Understanding how hosts interact with microbes to increase health due to mutualism or increase sickness due to pathology.*

**Labs:**
- **Helen M. Blau** (Cellular reprogramming and stem cell function)
- **John Boothroyd** (Toxoplasma Gondii pathogenesis)
- **Jan Carette** (Host genes involved in viral pathogenesis)
- **Yueh-hsiu Chien** (gd T cell function and immune defense)
- **Mark M. Davis** (T & B cell recognition and control of immune responses)
- **Juliana Idoyaga** (Immunobiology of Dendritic cells)
- **Holden Maecker** (Cellular immune responses to pathogens and cancer) → HIMC
- **AC Matin** (Cancer therapy)
- **Denise Monack** (Mechanisms of intracellular bacterial pathogenesis)
- **Garry Nolan** (Immunology, signaling, pathogen infection, auto-immunity, bioinformatics).
- **Peter Sarnow** (Mechanisms that regulates HCV amplification)
- **David Schneider** (Mechanisms of recovery)
- **Robert Siegel** (Medical education and curricular development)
- **Justin L. Sonnenburg** (Interactions between microbiota and the host)

**Education:** To provide the best possible and inspiring training in microbiology, immunology, host-pathogen interaction.
Basic Science: Microbiology & Immunology

- Historically, immunologists try NOT to study sex differences (i.e., use all female mice)
- Human immune studies allow us to study sex effects at a system level
- Dr. Mark Davis

**Systems analysis of sex differences reveals an immunosuppressive role for testosterone in the response to influenza vaccination**

David Furman\(^a,1,2,3\), Boris P. Hejblum\(^b,1\), Noah Simon\(^c\), Vladimir Jojić\(^d\), Cornelia L. Dekker\(^e\), Rodolphe Thiébaut\(^b\), Robert J. Tibshirani\(^c,f\), and Mark M. Davis\(^a,g,h,3\)

**Significance**

There are marked differences between the sexes in their immune response to infections and vaccination, with females often having significantly higher responses. However, the mechanisms underlying these differences are largely not understood. Using a systems immunology approach, we have identified a cluster of genes involved in lipid metabolism and likely modulated by testosterone that correlates with the higher antibody-neutralizing response to influenza vaccination observed in females. Moreover, males with the highest testosterone levels and expression of related gene signatures exhibited the lowest antibody responses to influenza vaccination. This study generates a number of hypotheses on the sex differences observed in the human immune system and their relationship to mechanisms involved in the antibody response to vaccination.
Basic Science: Microbiology & Immunology

- Dr. Juliana Idoyaga

**Plasmacytoid DC**

- Essential for anti-viral responses
- Involved in IFN-I autoimmune diseases

**Interferon (IFNα, IFNβ)**

**viral DNA**

**viral RNA**

**TLR-7**

**TLR-9**

**Imiquimod**

**Resiquimod**

%IFNα⁺ pDCs by gender:

- Females (F)
- Males (M)
ATAC-seq reveals chromatin accessibility variability among pDCs from male and female donors.
Department Chair: Miriam Goodman

- Dept. Chair-design. **WHSDM Representative:** Daniel Madison
  - Associate Chair

Department research interests are mostly molecular, but a few faculty work on issues that have potential relevance toward understanding sex differences in medicine

- Merritt Maduke: Development of an inhibitor for CLC-Ka chloride transporter inhibitor – as a potential treatment for hyponatremia. Women have generally worse outcomes than men.

- Thomas Sudhof: Including both sexes in studies of the formation of synapses and synaptic communication.

- Daniel Madison: Sex Difference in Hippocampal Physiology & Response to Circadian Dysfunction.

http://mcp.stanford.edu
The Circadian Rhythm of Siberian Hamsters Can be Permanently Disabled by a Modest Stimulus

The Disruptive Phase Shift (DPS) Protocol

single specific disruption of the light/dark cycle permanently abolishes the Circadian rhythm

After a very long period (years) of comparing hippocampal synaptic physiology in entrained (ENT) and arrhythmic (ARR) hamsters, we discovered that there were no significant differences in synaptic function...

...except for one odd finding.
Because the main connection between SCN and Hippocampus is indirect and muscarinic, we had tested the effect of carbachol of paired-pulse facilitation.

There was no interaction between muscarinic receptor activation (Carbachol) and paired pulse responses of synaptic transmission itself.

But there was a large effect on the evoked discharge of neurons, revealed in the population spike.
What About Sex Differences?

ENTs experience a greater enhancement of paired pulse facilitation by muscarinic receptor activation. This effect is more strongly expressed in female animals.
Collaborators

Laura McMartin

Marianna Kiraly

Norman (Bud) Ruby

H. Craig Heller

Siberian Hamster
Basic Science: Neurobiology

Department Chair: Thomas Clandinin, PhD
- Dept. Chair-design. WHSDM Representative: Nirao Shah, MD, PhD

Mission/Vision

Research Interests:
- Development, structure, and function of visual, olfactory, and auditory systems
- Experiential and innate mechanisms of fine-tuning neural circuits
- Nervous system repair and regeneration
- Spatial navigation and memory
- Cerebellar circuits and learning
- Perception, Attention
- Decision-making
- Visuo-motor integration

http://bioengineering.stanford.edu
Basic Science: **Neurobiology**

**Research Interests, continued:**

- Theoretical and computational aspects of cognitive processes
- Tool development: biosensors such as voltage sensors, chemical or light-based control of cellular processes, mapping fine scale structure of neural circuits, functional mapping of neural circuits
- Motor control and brain-machine interfaces
- Fear
- Sex differences in innate social interactions
- Cognitive aspects of social interactions
- Ethical issues in biomedical fields

**Education:** Interdepartmental Neurosciences PhD program; Medical students; Postdoctoral Trainees

http://neurobiology.stanford.edu
Understanding the impact of sex in Alzheimer's disease

Beth Mormino, PhD
Department of Neurology and Neurological Sciences
Stanford University
Global Prevalence of Alzheimer’s Dementia

5.7 million American adults and 47 million adults worldwide are estimated to have Alzheimer’s dementia.

2/3 of AD patients are women.

5th leading cause of death for women and 8th leading cause of death for men.

Longevity, survival bias, and comorbidities influence increased prevalence.

Regardless of prevalence differences, sex specific factors undoubtedly influence AD risk.

2018 Alzheimer’s Disease Facts and Figures. Alzheimer’s Association
QuickStats: Number of Deaths from 10 Leading Causes,* by Sex — National Vital Statistics System, United States, 2015. CDC.
Alzheimer’s & Dementia: Global Resources. Alzheimer’s Association.
Alzheimer’s disease dementia

Progressive neurodegenerative disease

Episodic memory

Initiated by beta-amyloid (Amyloid Hypothesis)

Until recently, pathology only observed at autopsy

http://med.stanford.edu/neurology.html
Imaging biomarkers of the AD cascade

Before Overt Dementia

How does sex influence this cascade?

http://med.stanford.edu/neurology.html
Sex in Alzheimer’s Disease progression and the trajectory of change in biomarkers

• APOE4+ women more at risk for clinical AD than APOE4+ men

• Women show greater brain atrophy rates and greater cognitive and clinical decline compared with men

• AD pathology is more likely to be expressed clinically as dementia in women than in men

➔ Mechanisms underlying increased vulnerability in women are unknown
The effects of sex steroids throughout the lifespan

- Sex steroid hormones have organizational effects on the brain that contribute to sex differences in cognition
- Early surgical removal of the ovaries is associated with cognitive decline
- Verbal memory decreases during the transition from premenopause to postmenopause and may resolve in the early postmenopausal period
- HT has neutral effects on cognition in the early postmenopausal period, but increased risk of dementia in women 65+

➔ Unclear links between sex steroids, cognitive aging, and AD risk

http://med.stanford.edu/neurology.html
Conclusion

Incorporation of sex specific factors will improve ability to estimate individual level risk of AD

Sex differences may be important for clinical trial design and developing AD therapeutics

Given the influence of sex specific factors throughout the lifespan, it is difficult to understand mechanisms influences risk of late life diseases.

Sex effects on cognition and AD

Sex steroids

http://med.stanford.edu/neurology.html
Clinical Science: **Neurosurgery**

**Department Chair:** Gary K. Steinberg, MD, PhD  
- Dept. Chair-design. *WHSDM Representative:* Odette Harris, MD, MPH,  
  - Associate Professor, Neurosurgery, Palo Alto Veterans Affairs Health Care System

**Research:** focus on **brain disease & injury** with goals of **protecting** and **repairing damage** caused by **stroke**, **cancer**, **trauma** & **neurodegenerative diseases**, e.g. Parkinson’s, Alzheimer’s Disease

**Education:** acquisition of clinical skills in neurosurgery  
**deep commitment to academic and research pursuits**

**Programs & Divisions**
- Brain Tumor Center  
- Center for Compassion & Altruism  
- Cerebrovascular Neurosurgery  
- Concussion & Brain Performance  
- Epilepsy  
- Pain  
- Functional Neurosurgery  
- Head & Spine Trauma  
- Moyamoya  
- Neurogenetics  
- Pediatric Neurosurgery  
- Pituitary Center  
- Radiosurgery/Cyberknife  
- Spine & Peripheral Nerve Surgery

http://med.stanford.edu/neurosurgery
Theo Palmer, PHD Associate Professor, Neurosurgery

Amy Braun, Doctoral Candidate

Sex-bias = Information
Females ≠ Complication

Can Female Mice Improve Autism Research?

By Brook Borel and Spectrum | October 20, 2015 |

In a lab in Sacramento, California, a wall of plastic boxes lined with corncob bedding holds around 800 mice. Even in this clean and bright room, the smell of so many mice concentrated in one place is overpowering — pungent, and familiar to anyone who has spent time with a pet hamster or gerbil. Most of the boxes hold four adult mice, which flit about, noses twitching as they stare out at the humans staring in. But in one of the boxes, a sleek white mouse is tucked in a corner suckling her litter of half a dozen or so squirmy, dark-furred pups.

In most research labs, the fate of these pups would be determined by their sex. The males would spend their lives as test subjects. The females would either be kept for breeding or simply euthanized because they’re not ideal for experiments: They’re supposedly more difficult to work with and generate less consistent data than males.

Trial by water: The ‘water maze’ probes learning and memory in mice, but how exactly the performances of males and females differ is still unclear.
Director: William (Bill) Newsome, PhD

- Institute WHSDM Representative: Vinod Menon, MD
  --Professor of Psychiatry and Behavioral Sciences, and of Neurology and Neurological Sciences

A campus-wide interdisciplinary initiative for brain research
Grand scientific challenge of the 21st century – One of the last expanses of the unknown

Treating neurologic and psychiatric disorders across the lifespan

Who are we, really? Thought, emotion, creativity, morality

Who will we be? How will we interact with new technologies?

THE PLACE IS STANFORD! THE TIME IS NOW!

POSITION OF STRENGTH
Stanford has been ahead of the curve uniting scientists across disciplines around challenging questions in neurosciences.

NEW TOOLS
New technologies and conceptual frameworks are revolutionizing neuroscience research.

TRANSFORMATIVE POTENTIAL
As it was with quantum physics and the genetic code in the 20th century, neuroscience will be THE transformative science of the 21st century

https://neuroscience.stanford.edu/
Clinical Science: Obstetrics & Gynecology

Department Chair: Leslee Subak, MD, Professor

- Dept. Chair-design. WHSDM Representative: Virginia D. Winn, MD. PhD
  - Associate Professor, Obstetrics & Gynecology (Director of Perinatal Biology)

http://obgyn.stanford.edu
<table>
<thead>
<tr>
<th>Division</th>
<th>Name</th>
<th>Research Focus</th>
<th>Division Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reproductive, Stem Cell and Perinatal Biology</strong></td>
<td>Aaron Hsueh</td>
<td>Ovarian Development, Oocyte Activation for Treatment of Infertility (IVA), Ovary Kaleidoscope Database (OKdb)</td>
<td>Basic, Translational</td>
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<tr>
<td></td>
<td>Virginia Winn</td>
<td>Placental Biology, Endothelial Progenitor Cells, Extracellular Vesicles, Preeclampsia (Pregnancy biobank)</td>
<td>Basic, Translational</td>
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<tr>
<td></td>
<td>Vittorio Sebastiano</td>
<td>Stem Cell Biology, Early Human Development Fate Determination, iPSC derivations translational opportunities</td>
<td>Basic, Translational</td>
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<tr>
<td><strong>Family Planning</strong></td>
<td>Paul Blumenthal</td>
<td>Contraception and Abortion services; RCTs ; Systematic Reviews; Global health care in Low Resource Settings; Demedicalization and simplification of Family Planning and Abortion programs; Development of New Contraceptive Technologies (microspheres, Apps for self-management); Cervical Cancer Prevention in Low Resource Settings</td>
<td>Clinical</td>
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<tr>
<td></td>
<td>Lisa Goldthwaite</td>
<td>LARC clinical trials</td>
<td>Clinical</td>
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<tr>
<td></td>
<td>Kate Shaw</td>
<td>Clinical Trials of Abortion Care, Breastfeeding and Contraception and Procedure Pain Management</td>
<td>Clinical</td>
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<tr>
<td><strong>Female Pelvic Medicine</strong></td>
<td>Bertha Chen</td>
<td>Stem Cells Regenerative Medicine for Pelvic Prolapse, Molecular causes of incontinence and prolapse</td>
<td>Basic, Translational</td>
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<td>Eric Sokol</td>
<td>Clinical trials of innovative therapies, Biodesign Program</td>
<td>Translational</td>
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<td>Lisa Rogo-Gupta</td>
<td>Vaginal mesh complications, outcomes, systematic reviews</td>
<td>Clinical</td>
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<td></td>
<td>Leslee Subak</td>
<td>Urinary &amp; bowel incontinence, OAB, prolapse, sexual function, ED, obesity: epidemiology, RCTs, novel therapies, economic and cost-effectiveness analysis</td>
<td>Clinical, Translational</td>
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<tr>
<td>Division</td>
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<td>Research Focus</td>
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<tr>
<td>Gyn Oncology</td>
<td>Jonathan Berek</td>
<td>Immunotherapy and small molecules for gynecologic cancers</td>
<td>Translational</td>
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<td>Oliver Dorigo</td>
<td>Immunotherapy and Genomics of Ovarian Cancer</td>
<td>Basic, Translational</td>
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<td>Nelson Teng</td>
<td>Ovarian Cancer and Humeral Immune System</td>
<td>Basic, Translational</td>
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<td>Erinn Rankin</td>
<td>Bone Development Novel oncogenic pathways in ovarian cancer</td>
<td>Basic, Translational</td>
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<td>Wendy Fantl</td>
<td>Next generation multi-parametric single-cell technology platforms applied to gynecologic cancers</td>
<td>Basic, Translational</td>
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<tr>
<td>MFM/Obstetrics</td>
<td>Yasser El-Sayed</td>
<td>Clinical Trials of Obstetrical Management</td>
<td>Clinical</td>
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<td>Deirdre Lyell</td>
<td>Abnormally Adherent Placenta: Accreta Spectrum (ultrasound, biobank, clinical outcomes)</td>
<td>Clinical</td>
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<td>Amen Ness</td>
<td>Preterm Birth, Short Cervix, Pregnancy Complications</td>
<td>Clinical</td>
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<td></td>
<td>Yair Blumenfeld</td>
<td>Fetal Birth Defects, Fetal Intervention, Congenital Diaphragmatic Hernia</td>
<td>Clinical, Translational</td>
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<tr>
<td></td>
<td>Natalie Aziz</td>
<td>Infectious Disease and Pregnancy, probiotics/GBS, chorioamnionitis diagnosis and treatment, and congenital CMV</td>
<td>Clinical, Translational</td>
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<tr>
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<td>Maurice Druzin</td>
<td>Obstetric Complications, Safety</td>
<td>Clinical</td>
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<tr>
<td>Division</td>
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<td>Research Focus</td>
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<tr>
<td>REI</td>
<td>Val Baker</td>
<td>IVF Outcomes</td>
<td>Clinical, Translational</td>
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<tr>
<td></td>
<td>Barry Behr</td>
<td>IVF methods and Embryo Selection (Biobank)</td>
<td>Clinical, Translational</td>
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<td></td>
<td>Ruth Lathi</td>
<td>IVF therapies and recurrent pregnancy loss</td>
<td>Clinical</td>
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<td></td>
<td>Lynn Westphal</td>
<td>IVF and PCOS, fertility preservation</td>
<td>Clinical</td>
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<tr>
<td>Pediatric &amp; Adolescent Gynecology</td>
<td>Paula Hillard</td>
<td>Adolescent Gynecology - Contraception and Reproductive Health</td>
<td>Clinical</td>
</tr>
<tr>
<td>General Gynecology</td>
<td>Deirdre Lum</td>
<td>Laparoscopy Surgery</td>
<td>Clinical</td>
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</tbody>
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http://obgyn.stanford.edu
Clinical Science: **Ophthalmology**

**Department Chair:** Jeffrey Goldberg, MD, PhD

- Dept. Chair-design. **WHSDM Representative:** Suzann Pershing, MD, Assistant Professor of Ophthalmology at the Palo Alto Veterans Affairs Health Care System

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**Mission/Vision**

**Vision:** to eliminate blindness and ocular disease in our community and around the world.

**Mission:** to build the premier national and international program in Ophthalmology, and to generate the diagnostics and therapeutics that change vision care worldwide.

We will do this via excellence in clinical care, education, and research—leveraging resources and collaborative opportunities across Stanford.

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http://ophthalmology.stanford.edu/
Departmental Research Goals:

- Elucidate the distribution and severity of eye diseases among women
- Understand disparities in burden of disease and receipt and response to ocular therapeutic interventions.
- Explore differential effect of environmental factors on women’s eye health

Ophthalmology Faculty with Interests in Women’s Health and Sex Differences:

A diverse group of faculty, with subspecialties ranging from general ophthalmology, glaucoma, neuro-ophthalmology, retina, and interest in broader questions related to the interface of women’s health with population health, health services research, and outcomes analysis (including utilization of big data sources).
Sex Differences and Eye Health:

- Many eye diseases disproportionately affect women, including dry eye, age-related macular degeneration, cataract, glaucoma, refractive error, and low vision/blindness.

- “The eye’s accessibility alone should make it a more preferred research target than it already is for estrogenic action.... Given the involvement of sex hormones or sex-hormone balance for so many physiological functions... the ability of menopausal changes to perceptibly alter an individual’s vision... should not be considered surprising.” Eisner, A. Sex, Eyes, and Vision: Male/Female Distinctions in Ophthalmic Disorders. Current Eye Research 2015; 40(2): 96–101

- “One of the most pressing challenges in... women’s eye health disparities is a paucity of baseline data on outcomes.” Clayton, JA, and Davis, AF. Sex/Gender Disparities and Women’s Eye Health. Current Eye Research 2015; 40(2): 102-109

http://ophthalmology.stanford.edu/
Clinical Science: Orthopaedic Surgery

Department Chair: William Maloney, MD

- Dept. Chair-design. **WSDM Representative:** Loretta Chou, MD Professor,

**Mission/Vision**

- advancing knowledge related to care of musculoskeletal system conditions through basic science and clinical research

**Research Areas** (subspecialties): adult arthritis/joint reconstruction; foot & ankle; hand & upper extremity; shoulder & elbow; spine; sports medicine; musculoskeletal tumor; pediatric orthopaedics

**Education:** 5-yr comprehensive residency. **Fellowships:** Foot & Ankle; Hand & Upper Limb; Joint Replacement/Adult Reconstruction; Spine; Orthopaedic Trauma; PM&R Intervention Spine; PM&R Sports Medicine

http://ortho.stanford.edu/
Loretta Chou, MD, Professor, Orthopaedic Surgery (Foot & Ankle)

Higher prevalence of breast cancer in women Orthopaedic Surgeons. Compared to U.S. women, as well as Plastic Surgeons and Urologists with similar background, education.

Amy Ladd, MD, Professor, Orthopaedic Surgery (Hand Surgery), & Medicine

• Sex and gender in musculoskeletal science
  • Disproportionate incidence and manifestations men vs. women
    • Osteoarthritis
    • Osteoporosis
    • Injuries – ACL (anterior cruciate ligament)
    • Scoliosis
• Disproportionate surgical treatment, usually favoring men
• High incidence of breast cancer in women orthopaedic surgeons
  • Collaboration needed to advance research to understand demographics, incidence, prevention, and treatment

http://ortho.stanford.edu/
Other areas of interest and collaboration

Ariel Palanca, MD, Foot and Ankle Surgery
Enrolling patients in a mindfulness/alternative pain therapy program to limit peri-operative and postoperative narcotics use. Start preop and extend to postop. Collaborate with primary care, psychiatry, pain management.

Constance Chu, MD, Sports Medicine
Differences between males and females in PRP (platelet rich plasma). Also, older females, in particular, show gait changes that correlate with levels of inflammatory mediators in blood. We would be interested to work with collaborator studying perimenopausal changes.
Clinical Science: Otolaryngology

Department Chair: Robert Jackler, MD

- Dept. Chair-design. WHSDM Representative: Elizabeth (Erickson) DiRenzo, PhD, MS, Assistant Professor, Otolaryngology (Head and Neck Surgery)

Mission/Vision

- Provide the highest possible quality of patient care, finest possible educational experience, foster imagination, creativity and innovation
- Committed to engaging in high impact basic and translational research, invent new technological application
- Collaborate widely to advance field to overcome otolaryngological diseases.

DIVISIONS

- Basic science research
- Facial Plastic Surgery
- Head & Neck Oncology
- Laryngology
- Otology & Neurology
- Pediatric
- Otolaryngology
- Rhinology
- Sleep Surgery
- General

http://med.stanford.edu/ohns
Robert Jackler, MD: Tobacco Industry’s promotion of smoking in women

Jennifer Alyono, MD: Effect of menopausal therapy on hearing loss; History of women in otology

Elizabeth (Erickson) DiRenzo, PhD: Clinical and biological factors underlying the increased prevalence of voice disorders in women

Edward Damrose & Elizabeth (Erickson) DiRenzo, PhD: Cellular and molecular underpinnings of idiopathic subglottic stenosis in women

Uche Megwalu, MD, MPH: Sociodemographic disparities in head and neck cancer

John Sunwoo, MD: What’s driving worse survival for melanoma in men? (WSDM B&T 2015; males >> females; collaborating with Swetter- Derm.)
Clinical Science: Pathology

Department Chair: Thomas J. Montine, MD
• Dept. Chair-design. WHSDM Representative: TBD

Mission
- To improve the diagnosis, treatment and basic understanding of human disease by clinical service, education and research.

Research: advance basic science, translational & clinical research in pathology and related fields. Broad range of research interests, with particular strengths in cancer biology, cell cycle regulation, genomics, inflammation, immunology, signal transduction, & stem cell research

Education: Foster development of leaders in pathology & related fields (medical/graduate students, residents/fellows, & postdocs).

http://pathology.stanford.edu
Clinical Science: Pathology

TBD

Work & education on the pathogenesis, classification, and diagnosis of breast cancer in the Department of Pathology:

- **Marius Wernig, MD, PhD** Stem Cells and Reprogramming into the Neural Lineage *(WSDM B&T 2013)*

- **Rob West, MD, PhD & Matt van de Rijn, MD, PhD**: Genetic and phenotypic studies of the pathogenesis & subclassification of human breast cancer, employing genetic, tissue array, 3SEQ, and computer learning approaches *(Daphne Koller, Ph.D., SOE)*:

- **Kimberly Allison, M.D. & Kristin Jensen, M.D.** Clinical-pathological studies of breast cancer and (K.A.) advocacy work.

- ACGME-accredited Clinical Fellowship in GYN/Breast Pathology: **Kim Allison, M.D. & Teri Longacre, M.D.** (Co-Directors)

http://pathology.stanford.edu
Tandy Aye and Mary Leonard are examining the impact of sex and maturation on trabecular and cortical microarchitecture in children and young adults using state-of-the-art imaging, the second-generation high-resolution peripheral quantitative CT (HR-pQCT) scanner (XCT II, Scanco Medical).
Tandy Aye is also the Medical Director of the **Stanford Pediatric and Adolescent Gender Clinic**. This is the first multidisciplinary gender clinic to provide services from pediatric endocrinology, adolescent medicine, child psychology and psychiatry, social work, adolescent gynecology, pediatric general surgery and pediatric urology.

**http://pediatrics.stanford.edu/**
• Tandy Aye, MD
  – The impact of pubertal blockers and cross-sex hormone therapy on the brain, bone and body composition in transgender youth

http://www.stanfordchildrens.org/en/service/gender

https://www.youtube.com/watch?v=FBdwQsTY7ec&feature=youtu.be
&list=PLB0AYRZmsManwPn7dI9voNuQCifj3khtY

https://www.youtube.com/watch?v=BaNXyu-j_mo

http://med.stanford.edu/pediatrics.html
Clinical Science: Psychiatry & Behavioral Sciences

Department Chair: Laura Roberts, MD

- Dept. Chair-design. **WHSDM Representative:** David S. Hong, MD, Assistant Professor of Psychiatry & Behavioral Sciences (Interdisciplinary Brain Science Research)

**Mission/Vision** aim to cure mental illness and advance understanding of the brain’s biological underpinnings, functions, development, plasticity, regulation, dysfunction, vulnerabilities, aging, and resilience

In addition to academic programs and endowed professorships and laboratories, the department has four main divisions:

**CHILD & ADOLESCENT PSYCHIATRY & CHILD DEVELOPMENT**
- Autism
- Eating Disorders
- General Psychiatry and Psychology
- Medical Psychiatry and Consultation Liaison
- Mood and Anxiety
- Special Programs, Clinical Trials and Nested Laboratories

**GENERAL PSYCHIATRY & PSYCHOLOGY**
- Evaluation and Brief Intervention
- General Psychiatry and Psychology
- Inpatient Psychiatry and Acute Services
- Interventional and Neuropsychiatry
- Medical Psychiatry and Consult Liaison
- Psychosocial and Subspecialty Care
- Special Programs, Clinical Trials and Nested Laboratories

**PUBLIC MENTAL HEALTH & POPULATION SCIENCES**
- Epidemiology, Prevention and Biostatistics
- Veteran and Elder Populations
- Student and Young Adult Populations
- Ethics, Vulnerable Populations, and Public Policy
- Special Programs, Clinical Trials and Nested Laboratories

**SLEEP MEDICINE**
- Medical
- Surgical
- Subspecialty
- Special Programs, Clinical Trials and Nested Laboratories

http://med.stanford.edu/psychiatry.html
Sex is a critical determinant of mental health & wellbeing. Known sex differences in rates of mental illnesses, including depression, anxiety, eating disorders, autism, schizophrenia, and substance abuse are associated with profound differences in morbidity. There are specific initiatives to address these highly sex-specific aspects through research and clinical care.

Faculty conducting women’s health or sex differences research:

- Cara Bohon (eating disorders, obesity)
- Cheryl Gore-Felton (anxiety disorders, PTSD)
- David Soonil Hong (Turner, Kleinfelter Syndr)
- James Lock (eating disorders)
- Rachel Manber (sleep, CBT for insomnia)
- Ruth O'Hara (neurocognitive impairment)
- Sarah Ordaz (depression)
- Natalie Rasgon (estrogen effects: neuroendocr)

- Allan Reiss (fragile X, sex chrom. variation)
- Thalia Robakis (depression)
- Nirao Shah (mating, fighting, parenting)
- Manpreet Singh (depression, bipolar)
- David Spiegel (mind/body, stress, breast CA)
- Julie Weitlauf (women veterans)
- Katherine Williams (women’s wellness)
- Helen Wilson (trauma over lifespan)

http://med.stanford.edu/psychiatry.html
Clinical Science: Radiation Oncology

Department Chair: Quynh-Thu Le, MD

- Dept. Chair-design. WHSDM Representative: Kate Horst, MD, Assistant Professor, and Elizabeth (Beth) Kidd, MD, Assistant Professor

Mission advanced care at cutting edge of research & technology

Research: rapidly implement breakthrough discoveries to improve clinical outcomes; advanced “state-of-the-art” imaging systems & radiation delivery platforms; linear accelerator for therapeutic use

Education: Radiation Therapy, Radiation Physics Residency programs; medical students; graduate students; post-doctoral fellows.

Breast Radiation Therapy With or Without Trastuzumab in Treating Women with DCIS who have Undergone Lumpectomy

Prostate Radium-223 Dichloride (Bay88-8223) in Castration-Resistant (Hormone-Refractory) Prostate Cancer Patients With Bone Metastases

http://radonc.stanford.edu
Mission

- To expand interdisciplinary research efforts in anatomic imaging, instrumentation development, molecular imaging, nanotechnology, information sciences, systems biology, and intervention therapeutic advances; leading edge technology.

Research (4 divisions): Radiological Sciences Laboratory (RSL), Molecular Imaging Program at Stanford (MIPS), Integrative Biomedical Imaging Informatics at Stanford (IBIIS), Canary Center at Stanford for Cancer Early Detection

Education: Clinical & Research; Radiology Residency; Postdoctoral Fellowships

http://radiology.stanford.edu
Clinical Science: Radiology

New Center!

Precision Health & Integrated Diagnostics (PHIND) Center

- Sam Gambhir, MD, PhD – Director
- Ryan Spitler, PhD – Deputy Director

Vision

Predict. Prevent. Diagnose. Cure. **Precisely.**

Precision Health is a fundamental shift to more proactive and personalized health care that empowers people to lead **healthy** lives.

Stanford Medicine is driving this transformation by leveraging the art and science of medicine to predict and prevent disease before it strikes and diagnose/cure it decisively if it does.

http://med.stanford.edu/phind.html
Mission/Vision

Current research Interests:

- Molecular recognition by immune system, cellular recognition by adhesion molecules; structure & activity of molecular chaperones; structure & mechanism of ribozymes; transcriptional mechanisms; and protein folding

Education: Graduate students; Postdoctoral Trainees

http://structuralbio.stanford.edu
Clinical Science: Surgery

Department Chair: Mary T. Hawn, MD, MPH

WHSDM Representative: Arden Morris, MD, MPH
<table>
<thead>
<tr>
<th>Division</th>
<th>Name</th>
<th>Project</th>
<th>Field</th>
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<tbody>
<tr>
<td>General Surgery VA</td>
<td>Sherry Wren</td>
<td>Gender differences in surgical outcomes among patients with CHF</td>
<td>HSR</td>
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<tr>
<td>Colorectal Surgery</td>
<td>Cindy Kin Arden Morris</td>
<td>Sex-based differences in chronic pain and opioid use among patients</td>
<td>HSR</td>
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<tr>
<td>Plastic Surgery</td>
<td>Sabine Girod Loretta Chou</td>
<td>with surgical diseases</td>
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<tr>
<td>Orthopedic Surgery</td>
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<tr>
<td>Colorectal Surgery</td>
<td>Cindy Kin Arden Morris</td>
<td>The effect of sex on differences in treatment strategy and decision-</td>
<td>HSR</td>
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<td></td>
<td>KT Park Kate Bundorf</td>
<td>making in patients with inflammatory bowel disease</td>
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<tr>
<td>Breast Surgery</td>
<td>Irene Wapnir</td>
<td>Tattooing as an alternative to metal markers in breast biopsy</td>
<td>Clinical</td>
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<td>Trial</td>
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<tr>
<td>Breast Surgery</td>
<td>Irene Wapnir</td>
<td>Neoadjuvant Radiation for DCIS (NORDIS Trial), a pilot RCT of surgery</td>
<td>RCT</td>
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<td>vs RCT + Surgery</td>
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<tr>
<td>Acute Care Surgery</td>
<td>Tom Weiser</td>
<td>Patient- and Family-reported outcomes in trauma</td>
<td>HSR</td>
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<td>Minimally Invasive Surgery</td>
<td>John Morton</td>
<td>Gender differences in cardiac outcomes of bariatric surgery patients</td>
<td>Epi</td>
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</tbody>
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Clinical Science: Surgery

Stanford-Surgery Policy Improvement Research & Education

OUR MISSION

S-SPIRE is committed to

- improving the value of healthcare through research that informs policy and implementation;
- promoting a surgical health services research community through mentorship and collaboration;
- developing innovative mixed methodologies.

Our interdisciplinary team includes clinical and research faculty with expertise in implementation science, health economics, bioinformatics, and quantitative, qualitative, and mixed methodologies.

UPCOMING EVENTS

13th Annual Academic Surgical Congress 2018

http://med.stanford.edu/s-spire.html
Clinical Science: Surgery

Goodman Surgical Education Center at Stanford University

THE MISSION OF THE GOODMAN SURGICAL EDUCATION CENTER

The mission of the Department of Surgery at Stanford University is to provide excellent patient care, to deliver outstanding undergraduate and graduate education, and furthermore to invent the future of Surgery through a commitment to basic science, clinical research and innovation. To this end, the Goodman Surgical Education Center at Stanford is an integral part of these missions, and of the broad education programs throughout Stanford University School of Medicine.

http://goodmancenter.stanford.edu/
Clinical Science: Urology

Department Chair: Eila Skinner, MD

- **WSDM Representative:** Amy Dobberfuhl, MD *Instructor, Dept. of Urology*

**Vision** includes excellence in:
- **Clinical Care** *(personalized, patient-centered, evidence-based approach)*
- **Basic Science & Translational Research**;
- **Outstanding education** for next generation of urologists.

**Research:** biology of urologic cancers: prostate, kidney, and bladder; upper urinary tract obstruction; voiding dysfunction & inflammation; developing new & innovative urologic imaging & diagnostic techniques; exploring new treatment algorithms

**Education:** medical students, residents, fellows;
- **Fellowship** in pediatric and female urology (urogynecology)

**Divisions:** oncology, neuourology *(incl female/infertility)*, peds

http://urology.stanford.edu

WSDM 2018 / IRB 45362 / SRC GYNCVX0004 (Co-PI Amy Dobberfuhl, Co-PI Elizabeth Kidd, Advisor Bertha Chen): “Sex Differences in Lower Urinary Tract Function after Pelvic Radiation” – Are there sex differences in investigational urinary biomarkers in healthy non-radiated men and women with lower urinary tract dysfunction? Do biomarkers correlate with dose limiting bladder dysfunction during the acute phase of radiation in women with cervical and endometrial cancer? What is the natural history of radiation induced bladder dysfunction in women?

CIRM 2016-2018 / APLAC 31673 (PD Amy Dobberfuhl, PI Bertha Chen): Prevention of the Late Stage Adverse Effects of Radiation on the Bladder using Human Induced Pluripotent Stem Cells in a Rat Model (Female rats s/p ovariectomy) of Radiation Cystitis – Can bladder dysfunction be prevented and/or mitigated with a novel iPSC pSMC therapy?

SUFU Foundation 2017-2018 NCX (PI Amy Dobberfuhl, Advisor Bertha Chen): “Bladder remodeling and the transition from compensated to decompensated detrusor dysfunction in the rat model (Female rats) of partial bladder outlet obstruction and diabetic bladder dysfunction” – Can we better characterize bladder remodeling and fibrosis in a diabetic overactive female rat model, and female partial bladder outlet obstruction in the rat?
Clinical Science: Urology

SUFU Foundation 2017-2019 / APLAC 32941 (Fellow PI Shannon Wallace, Faculty PI Bertha Chen, Faculty Co-I Amy Dobberfuhl): “Optogenetic Neuromodulation in the (Female mouse) Diabetic Cystopathy Murine Model” – Can we use optogenetics to modulate bladder function in a diabetic overactive female mouse model?


IRB 42755 (PD Shannon Wallace, PI Bertha Chen): “The Incidence of Asymptomatic and Symptomatic Rectocele in Defecography” – Can we improve utilization of defecography for characterizing rectocele in women?

IRB 42500 (PD Shannon Wallace, PI Bertha Chen): “The Incidence of Urinary Retention After Laparoscopic Hysterectomy” – Can we predict who will have urinary retention after hysterectomy?

Foundation for Female Health Awareness 2018 (Fellow PI Shannon Wallace, Faculty PI Eric Sokol): “Cost-Effective Analysis of Vaginal Therapies for Genitourinary Syndrome of Menopause” – What is the comparative cost of laser treatment versus traditional therapies for vaginal atrophy?

IRB 38653 (PD/PI Ekene Enemchukwu, Co-I Elise DeVries): “Evaluation of Method to Decrease Post-Void Residual Urine in Women with Underactive bladder” – Can we develop a non-catheter approach to improve voiding in women with weak bladders?

http://urology.stanford.edu