Co-Directors, Co-Founders:

Marcia Stefanick, Ph.D.  Professor of Medicine (SPRC)
Professor of Obstetrics & Gynecology

Lynn Westphal, M.D.  Associate Professor, Obstetrics & Gynecology

Managing Director, WSDM  Sonoo Thadaney, M.B.A.
Program Associate, WSDM  Terri Oppelt (T.O.) Preising, J.D., M.Ed.

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

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

http://wsdm.stanford.edu
2001: Institute of Medicine - IOM report on Sex Differences
2010: IOM – Women’s Health Research

**Sex** - a classification, generally male or female, according to reproductive organs and functions that derive from chromosomal complement (*Biology*)

**Gender** (in studies of humans) is *socio-cultural*; refers to a person’s self-representation as male or female.

**Gender norms**: social expectations of masculine and feminine behaviors

**Gender relations**: how people of different genders react

**Gender identities**: how individuals or groups perceive and present themselves.

http://genderedinnovations.stanford.edu/terms/gender.html
10 yrs later: Researchers not complying with guidelines
Distribution of non-human animal studies by sex and field in 2009

Percent of articles of **non-human animal research** using only male or female animals, both male & female, or did not specify sex of animals.


---

**Putting gender on the agenda**

*Nature 465*, 665 (10 June 2010) | doi:10.1038/465665a
Published online 09 June 2010

Omission of females is skewing results.
A higher percentage of articles reported on both sexes in human \textit{than} non-human animal research (60\% versus 26\%).

*The zoology category was excluded because of insufficient use of human subjects in this field to form an accurate estimate.

Percent of articles describing human research in the same categories.*

Sex – the biological characteristics of males and females

Gender – the social meaning of being a male or a female
What is Gendered Innovations?

Londa Schiebinger, Ph.D, John L. Hinds Professor of History of Science, Stanford University
1. Recognition of Ovarian Determination as an Active Process.
2. Discovery of Ongoing Ovarian and Testis Maintenance.
3. New language to Describe Gonadal Differentiation.
Health & Medicine Case Studies
Demonstrate Gender Methods in Basic and Applied Research

This page provides practical examples of how sex and gender analysis leads to gendered innovations.

- De-Gendering the Knee: Overemphasizing Sex Differences as a Problem
- Heart Disease in Women: Formulating Research Questions
- Osteoporosis Research in Men: Rethinking Standards and Reference Models
STANFORD UNIVERSITY SCHOOL OF MEDICINE
DEPARTMENTS (BASIC SCIENCE & CLINICAL)

in alphabetical order based on

Chair-designated

Department Representatives

availability to present at the

WSDM Seed Grant Workshop (Sept 27, 2013)
Clinical Department
Anesthesiology, Pain and Perioperative Medicine

Department Chair: Ron Pearl, M.D., Ph.D. Richard K. & Erika N. Richards Professor
Dept. Representatives: Martin Angst, M.D., Rona Giffard, M.D., Ph.D., Sean Mackey, M.D, Ph.D., Professors [all 3]

Mission: Research & Education

Research Areas of Interest (Basic & Clinical):
- Pharmacokinetics/dynamics (adult/pediatric)
- Cerebral ischemia/stroke (preclinical)
- Immunity in surgery/trauma (clinical/molecular)
- Pulmonary hypertension (preclinical/clinical)
- Anesthetic mechanisms (neuroscience/molecular modeling)
- Patient safety (simulator)
- Acupuncture
- Obstetrics (clinical)
- Pain

Educational Goals – Innovations in Resident Education; Teaching Scholars Program; Simulation Program; Special Rotations

http://med.stanford.edu/anesthesia
Immune health in surgery & trauma

- H1: Specific immune phenotypes predict risk for postoperative complications
- H2: Immune phenotyping → discovery of mechanisms aggravating/alleviating such risks
- H3: Gained knowledge → immune-modulatory strategies mitigating such risks
- Principal tools: Mass cytometry (CyTOF), proteomics, and ex-vivo immune assays
Stroke is sexually dimorphic, female protection varies with estrus cycle
• Cell death pathways differ in male and female brains
• Immune differences contribute to sex differences

**Principal tools:** cerebral ischemia, primary brain cell culture and rodent stroke models, miRNAs, heat shock proteins, mitochondria, oxidative stress, cell death

http://med.stanford.edu/anesthesia
Clinical Department

Anesthesiology, Pain and Perioperative Medicine

Dept. Representative:  **Sean Mackey, M.D, Ph.D.** Redlich Professor

- Pain Division Research Mission: “**To Predict, Prevent and Alleviate Pain**”
- Predictive factors that cause people to have:
  - Persistent pain after surgery or injury
  - Persistent use of opioids after surgery or injury
- Novel pharmacologic and mind-body therapies to reduce that persistence
- Multi-symptom chronic pain conditions that preferentially effect women (fibromyalgia, pelvic pain, headache, complex regional pain syndrome)
- Characterization of chronic pain with functional and structural neuroimaging – NIH U01
- Transcranial magnetic stimulation – cortical mechanisms and novel treatments

[http://med.stanford.edu/anesthesia]
**Clinical Department**

**Anesthesiology, Pain and Perioperative Medicine**

**Dept. Representative:** Sean Mackey, M.D, Ph.D. Redlich Professor

- Development of objective biomarkers for chronic pain
  Machine learning approaches.
  80% classification accuracy for female pelvic pain using brain gray matter

- Open source and free national pain registry
  Comparative effectiveness research, longitudinal assessment
  NIH PROMIS domains of medical, psychological & social functioning
  2/3 patients with chronic pain are women
  Example: Women with less than high school education have OR = 28 for severe category of chronic pain

- Mind-body therapies, emotion regulation circuits and chronic low back pain (NIH P01)
  Supplement project on catastrophizing in women, effects of brain gray matter and opioids in women

- Glial cell modulators for chronic pain

- Scherrer – delta and mu opioid role in pain in spinal dorsal horn

- Yeomans – nociceptive transduction, oxytocin in migraine

[Link to website: http://snapl.Stanford.edu]
Basic Science Department
Comparative Medicine

Department Chair: Sherril L. Green, D.M.V., Ph.D., Professor
Dept. Representative: Joseph Garner, Ph.D., Associate Professor

Mission: Research & Education –

- to advance human and animal health through outstanding research, veterinary care and training

Research: “One medicine, One health”: Through understanding the commonalities and differences between humans and animals, Comparative Medicine is the study and development of evidence-based best-practice for animal-based medical research. (e.g. developing new models, improving welfare, developing new surgical or experimental techniques).

Education: Undergraduate, Graduate, & Professional.

http://med.stanford.edu/compmed
The Department provides a wide range of services to support research, both as paid service and as collaborative research agreements.

http://med.stanford.edu/compmed/research/services/

1. Histology Lab
   • Pathology, Necropsy, & Histology Services.

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

3. Technique Refinement and Innovation Lab
   • 3D printing service, Equipment design service, Biostatistics service

4. Stanford Behavioral and Functional Neuroscience Lab

5. Mouse breeding and colony management

http://med.stanford.edu/compmed
Garner lab – Research and advocacy in Trichotillomania, Tourette’s & Autism

A major focus of my research is to understand the holistic development of mental illness to advance predictive, preventative, personalized medicine.

- How can we use reconstruct developmental history (in humans and animals) to find biomarkers that predict onset, or treatment response?
- Why does one sister become ill and another not?
- Why are so many disorders so strongly sex-biased while similar co-morbid disorders are not?
- What role does the environment, particularly prenatal stress and diet play in risk for gender-biased disorders?

In the case of Trichotillomania (95% of sufferers are women; 3-5% of women are affected), we have predictive biomarkers and preventative interventions in mice.

http://med.stanford.edu/compmed
Clinical Department
Dermatology

Department Chair: Paul Khavari, M.D., Ph.D. Carl J. Herzog Professor
Dept. Representative: Jean Tang, M.D., Ph.D. Assistant Professor

Mission/Vision
- to provide sustained leadership in scientific investigation, patient care, and in training leaders in an environment that fosters creativity and synergy

Research: spans wide range, from clinical trials to molecular translational medicine to fundamental epithelial biology

Education: 3-4 yr residency, competence in clinical & basic

http://dermatology.stanford.edu
Women’s Health Initiative (WHI)
Postmenopausal Women, aged 50-79, followed for 10+ years

Diet Modification (DM) Trial
- Breast & Colorectal Cancer
- Coronary Heart Disease (CHD)

Hormone Trials (E+P, E only)
- Coronary Heart Disease (CHD)
- Breast Cancer
- Stroke, Pulmonary Emboli
- Hip Fracture (Other Fx)
- Colorectal Cancer
- Uterine Cancer

- Calcium + Vitamin D Trial
  - Hip Fracture
  - Colorectal Cancer

Clinical Trials = 68,133

CT+OS = 161,808
Women’s Health Initiative (WHI): for skin cancer outcomes

Diet Modification (DM) Trial
3. Effect on melanoma and NMSC
   Cancer Epid, Biomarker, Prevent 2013

Hormone Trials (E+P, E only)
2. Effect on melanoma and NMSC
   J Nat Cancer Institute, 2011

4. NSAID and Melanoma
   Cancer 2013
5. BMI and Skin Cancer
   CEBP 2013
6. ETOH and Skin Cancer
   CEBP 2013

Observational Study
93,676

Calcium + Vitamin D Trial
1. Lowers melanoma risk in women with history of NMSC
   J Clinical Oncology 2011

Calcium + Vitamin D Trial (DM)
48,836

Calcium + Vitamin D Trial
36,282

7. Smoking
   CEBP under review
8. Statins
9. Sun protection
10. Serum vitamin D levels
Melanoma survival: White males do worse than females

(JAMA Derm, Swetter 2013)
Basic Science Department
Developmental Biology

Department Chair: William Talbot, Ph.D. Professor
Dept. Representative: Anne Villeneuve, Ph.D. Professor

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

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

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

Dept. Representative: Anne Villeneuve, Ph.D. Professor

Stuart Kim –
Personalized genetics to reduce injuries in Stanford female athletes

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

Anne Villeneuve –
Recombination and chromosome dynamics during sexual reproduction

Seung Kim –
Mouse model for gestational diabetes

http://devbio.stanford.edu
- Worm COSA-1 is a key protein required for meiotic recombination
- COSA-1/CNTD1 is also required for recombination in mice
- $CNTD1^{-/-}$ female mice have premature ovarian failure

Is variation at the $CNTD1$ locus in humans associated with:

a) increased risk of repeat aneuploid pregnancies?
b) premature ovarian failure?
c) variation in meiotic crossover frequencies?
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

http://genetics.stanford.edu
Maternal and Paternal contributions to fetus/placenta including DNA methylation and gene expression (imprinting)

Mike Snyder, Renee Pera, Julie Baker, Arend Sidow

Evolution of Y chromosome
Carlos Bustamante:

Male and Female aging
Stuart Kim and Anne Brunet

Cancer and Undiagnosed Childhood Diseases
Many investigators (e.g. Sage, Attradi, Snyder, Bustamante, Sidow)

http://genetics.stanford.edu
Basic Science Department – Genetics

Diseases of Pregnancy
- Prematurity
- Preeclampsia
- IUGR
- Previa

Endogenous Retroviruses

Epigenetics different than the baby/adult

Multinucleated and polyploid

Placenta

Dept. Representative: Julie Baker, Ph.D, Associate Professor
Basic Science Department
Health Research and Policy (HRP)

Department Chair: Phillip Lavori, Ph.D. Professor, Division Biostatistics
Dept. Representative: Julia Simard, Sc.D, Asst. Professor, Division, Epidemiology

Mission: Research & Education

Research: provides analytic foundation for SoM research

Biostatistics - defining standards for high-throughput (human genome) processing and developing more efficient methodologies for clinical trials
Epidemiology - distribution, determinants and control of illness and impairment in human populations
Health Services Research - Outcomes Research; Health Economics; CMS
Population Sciences - EMRs & large health-related databases

Education: Masters of Science programs: Epi & Clinical Research, HSR; Biostatistics PhD Training Program in Personalized Medicine

http://hrp.stanford.edu
Clinical Department

Medicine

Department Chair: Robert A. Harrington, M.D. Professor
Dept. Representatives: Tracey McLaughlin, M.D., M.S. Associate Professor
Jennifer A. Tremmel, M.D., M.S. Assistant Professor

Mission/Vision - http://medicine.stanford.edu

- Committed to setting highest standards of patient care, ground-breaking biomedical research, professional education, teaching and training
- Devoted to advancing the science of medicine by developing new methods to prevent, diagnose and treat all aspects of human disease

DIVISIONS

- Blood & Marrow Transplantation
- Cardiovascular Medicine
- Endocrinology, Gerontology & Metabolism
- Gastroenterology & Hepatology
- General Medical Disciplines
- Hematology
- Immunology & Rheumatology
- Infectious Diseases
- Nephrology
- Oncology
- Primary Care & Outcomes Research
- Pulmonary & Critical Care Medicine
- Stanford Prevention Research Center
- Stanford Biomedical Informatics Research
Clinical research on human obesity/adipocytes and insulin resistance: Why do women have larger adipose cells? Does this prevent visceral fat accumulation and/or protect from insulin resistance? Transgender model.

- Clinical studies on PCOS and insulin resistance
- Mouse models of gestational diabetes
- Study of osteoblasts/hematopoietic cells in bone: sex effect
- Epidemiologic studies on gender differences in the balance of androgen/estrogen, and their relation to multiple disease outcomes and responses to interventions.

http://medicine.stanford.edu
Clinical Department
Medicine

Dept. Representative: Jennifer A. Tremmel, M.D., M.S. Assistant Professor, Division, Cardiovascular Medicine

- **Stefanick, WHI:** atrial fibrillation (Dr. Marco Perez), genetics (Dr. Tim Assimes), CV outcomes/CMS (Dr. Mark Hlatky) and microRNA (Drs. Tim Assimes & Phil Tsao).

- Sex differences in Coronary Pathophysiology (endothelial dysfunction, microvascular disease, and myocardial bridging in patients with chest pain, but normal coronary arteries). Also evaluating MRI and collecting endothelial cells (Dr. Patricia Nguyen and Dr. Joe Wu)

- Radial vs. femoral PCI in women (prior sex differences with regard to bleeding, FFR, early MI)

- Effect of mindfulness-based stress reduction in women with chest pain, but no obstructive coronary artery disease

- Sex differences in participation in cardiac rehabilitation (Dr. Katie Sears)

- Prevalence of mental health issues in women presenting to a women’s heart clinic

- Effect of insomnia treatment on cardiac risk factors in women and men (Dr. Sears). Also evaluating this is peri-partum women (Dr. Rachel Manber PI, Psychiatry Behav Med)

- Behavioral intervention to reduce future cardiac risk in women with peri-partum hypertension (Dr. Sandra Tsai just got grant)
Women’s Heart Health Clinical Team’s Research Focus

- Jennifer Tremmel, M.D., M.S.
  Interventional Cardiologist (Sex Differences in Coronary Artery Disease)

- Mary Nejedly, NP
  Nurse Practitioner (Improving Health Services for Women with Heart Disease)

- Sandra Tsai, M.D., M.PH
  Internist, specializing in Preventive Cardiology (Preventing Future Risk in Peri-Partum Women)

- Katie Sears, Ph.D.
  Psychologist (Effect of Behavioral Medicine Therapies on CV Risk)

- Abha Kandelwal, M.D. starting October 1
  General Cardiologist (Improving Outcomes in South Asian Women, Women with Diastolic Dysfunction, and Pregnancy-related CV Disease)
Basic Science Department  
Microbiology and Immunology

Department Chair: Peter Sarnow, Ph.D., M.S. Professor  
Dept. Representative: Holden Maecker, Ph.D. Associate Professor

Mission

- To conduct the best possible research and provide the most rigorous and inspiring training in microbiology, immunology, host-pathogen interaction
- Through such activities, goal is to improve our ability to be responsible stewards of a fragile earth.

Research: Highly interactive, intensely collaborative environment

- Expanded beyond traditional focus on how microbes survive and cause disease and how host’s immune system discriminates between self, friend (commensal microbes) and foe (pathogenic microbes), to include genetic pharmacology, gene expression regulation, and stem cell biology

Education: to provide best possible training, holistic approach (entirety of system)

http://microimmuno.stanford.edu
Sex & Gender Studies in Microbiology & Immunology

M&I Dept. Representative: Holden Maecker. Associate Professor

- 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

Serum Cytokines:

<table>
<thead>
<tr>
<th>Cytokine</th>
<th>Female</th>
<th>Male</th>
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<tbody>
<tr>
<td>ENA78</td>
<td></td>
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<tr>
<td>GM-CSF</td>
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<tr>
<td>IL-6</td>
<td></td>
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<tr>
<td>Leptin</td>
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</tbody>
</table>

Legend:

- Female
- Male
Relationship of serum IL-6 and IL-6 stimulated signaling in females vs. males
Clinical Department
Neurosurgery

Department Chair: Gary Steinberg, M.D., Ph.D.
Bernard & Ronni Lacroute-William Randolph Hearst Professor

Dept. Representative: Odette Harris, M.D., M.P.H., Associate Professor

Mission/Vision

- Strongly committed to cross-disciplinary translational research

Research: focuses on brain disease and injury with goals of protecting and repairing damage caused by stroke, cancer, trauma & neurodegenerative diseases, e.g. Parkinson’s, Alzheimer’s Disease; strong collaborations with basic & clinical researchers. Examples: hypothermia & stroke; gene therapy; neural stem cell transplantation

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

http://med.stanford.edu/neurosurgery
Polytrauma
(OEF/OIF/OND)
Gender and the Effects of Polytrauma: A Retrospective Cohort Comparative Analysis

(Quantitative and Qualitative Assessments)

Hypothesis: As women represent such small numbers in the general Polytrauma patient cohort, their experience is not wholly represented in published outcomes that inform data-driven decisions regarding treatment, management & care of the Polytrauma population.

Thus Far:
- The Secretary of Defense Symposium on Traumatic Brain Injury

http://med.stanford.edu/neurosurgery
Clinical Department
Obstetrics and Gynecology

Department Chair: Jonathan Berek, M.D., MMS. Laurie Krause Lacob Professor
Dept. Representative: Renee Reijo Pera, Ph.D., George D. Smith Professor in Stem Cell and Regenerative Medicine & Professor, Obstetrics & Gynecology

Mission/Vision

- To provide sustained leadership in scientific investigation, outstanding patient care, & education by training future leaders

Research: committed to highest level of basic & clinical research; innovative, translational medicine (scientific results from bench to bedside)

Labs: Hsueh; Nayak; Chen; Teng; Reijo Pera; Reproductive & Stem Cell Biology; Gynecologic Oncology, Perinatal Biology; Charles B. and Ann L. Johnson Center for Pregnancy and Newborn Services

Education: Advanced Residency Training at Stanford; Ob/Gyn clerkship;

Fellowship Training: Family Planning; Gynecologic Oncology; Maternal-Fetal Medicine; Reproductive Endocrinology & Infertility; Urogynecology

http://obgyn.stanford.edu
Clinical Department
Orthopaedic Surgery

Department Chair: William J. Maloney, M.D., Elsbach-Richards Professor
Dept. Representative: Amy Ladd, M.D., Professor (Hand Surgery)

Mission/Vision

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

Research Areas (subspecialties): adult reconstruction & joint replacement; sports medicine; spine surgery; surgery of hand & wrist, shoulder & elbow, foot & ankle; musculoskeletal tumor surgery; orthopaedic trauma surgery; pediatric orthopaedics; physical medicine and rehabilitation

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
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

- Advance research to understand demographics, incidence, prevention, and treatment

http://ortho.stanford.edu
Clinical Department
Orthopaedic Surgery

Dept. Representative: Amy Ladd, M.D., Professor (Hand Surgery)

- Desired collaborations
  - Engineering sciences
    - Mechanical engineering, Bioengineering, Tissue Engineering
  - Clinical and medical sciences
    - Radiology – imaging disease, injury, and disorder
    - OB/GYN – breast cancer
    - Endocrine – thyroid cancer, osteoporosis
    - Psychiatry – mental health among
  - Campus wide
    - Bioinformatics, Statistics
      - Demographics of disease
    - Anthropology

http://ortho.stanford.edu
Clinical Department
Otolaryngology – Head & Neck Surgery

Department Chair: Robert Jackler, M.D. Edward C. and Amy H. Sewall Professor
Dept. Representatives: Jennifer Y. Lee, M.D., Clinical Assistant Professor

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 our field and 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
Obstructive sleep apnea is thought to affect 2% of women and 4% of men over 50 years of age.

How do women present differently than men?

How can we increase awareness and address the medical concern for these patients?
Clinical Department
Pathology

Department Chair: Stephen J. Galli, M.D. Mary Hewitt Loveless, M.D. Professor
Dept. Representative: Neeraja Kambham, M.D., Associate Professor

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 Department
Pathology

Dept. Representative: **Neeraja Kambham, M.D.**, Associate Professor

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


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

- Kim Allison’s book and advocacy work (for lay & medical groups):

“Red Sunshine” is a memoir about Dr. Allison’s sudden journey from physician to patient and her attempt to make the most of this terrifying and unexpected ordeal. Her experience reflects the incredible power of the bonds of friendship and family. It is about paying attention to the magic that is waiting to be uncovered in everyday life.

http://pathology.stanford.edu
Department Chair: Hugh O’Brodovich, M.D.
Dept. Representative: Neville H. Golden, M.D. Professor, Chief, Adolescent Med.

Vision/Mission - *per Chair, O’Brodovich*
- to support the Vision and Mission of the SSoM and LPCH
- to become one of the top 5 pediatric academic health science centers within the country within 5-10 year time frame *(has been ranked by US News & World Report in top 10 for years 2009-current inclusive)*
- Advance health of infants, children, and adolescents through innovative medical care, “bench-bedside-backyard” research, training and advocacy.  *see Pediatrics Research Guide*
- Broad-based training in ambulatory, inpatient, and community settings.

* http://pediatrics.stanford.edu/*
Clinical Department
Pediatrics

Dept. Representative: Neville H. Golden, M.D, Chief, Adolescent Medicine
The Marron and Mary Elizabeth Kendrick Professor in Pediatrics

DIVISIONS

- Adolescent Medicine
- Cardiology
- Critical Care
- Endocrinology and Diabetes
- Gastroenterology
- General Pediatrics
- Genetics
- Hematology/Oncology/
  Stem Cell/Cancer Biology
- Human Gene Therapy
- Immunology, Allergy and Rheumatology
- Infectious Diseases
- Neonatal and Developmental Medicine
- Nephrology
- Pulmonary Medicine
- Systems Medicine

http://pediatrics.stanford.edu/
Adolescence is a time when sex differences are more likely to present in many diseases. *Examples in 2 research areas:*

- **Eating Disorders**
  - Female predominance
  - Males underdiagnosed
    - More medically compromised, likely due to failure of recognition.
- **MRI Study** *(DTI – in Anorexia Nervosa vs controls)*
- **Bone density studies**

- **Gender-based Violence**
  - Kenyan “Self-defense study to prevent rape”

http://pediatrics.stanford.edu/
A self-defense program reduces the incidence of sexual assault in Kenyan Adolescent Girls

Participants

<table>
<thead>
<tr>
<th></th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruited</td>
<td>402</td>
<td>120</td>
</tr>
<tr>
<td>Lost to Follow-up</td>
<td>21</td>
<td>12</td>
</tr>
<tr>
<td>Included in Analysis</td>
<td>381</td>
<td>108</td>
</tr>
</tbody>
</table>

Mean Age 16.8 (1.5) years

Ref: Sinclair et al, JAH, 2013
Males are much more likely to be preterm

- M:F in term births is 1.04
  - 36-37 wks M:F = 1.17
  - 32-33 wks M:F = 1.20
  - 28-31 wks M:F = 1.25
  - 20-27 wks M:F = 1.30

- 10 year funding at $2 million/year
- Comprehensive approach to identify factors that cause preterm birth and that can be prevented
Clinical Department

Pediatrics- Neonatal and Developmental Pediatrics

DAVID STEVENSON - PI

GARY SHAW  
co PI

MAURICE DRUZIN  
co PI

PAUL WISE  
co PI

TRANSDISCIPLINARY:
• 3 LEAD INVESTIGATORS
• 65 INVESTIGATORS

SCIENTIFIC AREAS
• NEONATOLOGY
• MATERNAL – FETAL MEDICINE
• PULMONOLOGY
• BIOLOGY
• MICROBIOLOGY
• IMMUNOLOGY
• GENETICS
• EPIDEMIOLOGY
• MEDICAL INFORMATICS
• SYSTEMS ENGINEERING & ROBOTICS
• BIOENGINEERING AND STATISTICS
• HEALTH POLICY
• ECONOMICS
• EDUCATION
• ETHICS
• SOCIOLOGY
Clinical Department
Psychiatry and Behavioral Sciences

Department Chair: Laura Roberts, M.D., M.A. Katharine Dexter McCormick and Stanley McCormick Memorial Professor

Dept. Representative: Ruth O’Hara, Ph.D. Associate Professor

Advancing and integrating science with clinical innovation, educational excellence, community engagement/commitment, and professionalism and leadership development.

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

<table>
<thead>
<tr>
<th>CHILD &amp; ADOLESCENT PSYCHIATRY &amp; CHILD DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Autism</td>
</tr>
<tr>
<td>• Eating Disorders</td>
</tr>
<tr>
<td>• General Psychiatry and Psychology</td>
</tr>
<tr>
<td>• Medical Psychiatry and Consultation Liaison</td>
</tr>
<tr>
<td>• Mood and Anxiety</td>
</tr>
<tr>
<td>• Special Programs, Clinical Trials and Nested Laboratories</td>
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</tbody>
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<table>
<thead>
<tr>
<th>GENERAL PSYCHIATRY &amp; PSYCHOLOGY</th>
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<td>• Evaluation and Brief Intervention</td>
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<td>• General Psychiatry and Psychology</td>
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<td>• Inpatient Psychiatry and Acute Services</td>
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<td>• Interventional and Neuropsychiatry</td>
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<td>• Medical Psychiatry and Consult Liaison</td>
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<td>• Psychosocial and Subspecialty Care</td>
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<td>• Special Programs, Clinical Trials and Nested Laboratories</td>
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<th>PUBLIC MENTAL HEALTH &amp; POPULATION SCIENCES</th>
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<td>• Epidemiology, Prevention and Biostatistics</td>
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<td>• Veteran and Elder Populations</td>
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<td>• Student and Young Adult Populations</td>
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<td>• Ethics, Vulnerable Populations, and Public Policy</td>
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<td>• Special Programs, Clinical Trials and Nested Laboratories</td>
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<th>SLEEP MEDICINE</th>
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<td>• Surgical</td>
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<td>• Subspecialty</td>
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<td>• Special Programs, Clinical Trials and Nested Laboratories</td>
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ADVANCING SCIENCE

Sex Differences in Prevalence of Mental Health Disorders: Window to Etiology

Sex Differences in Autism Spectrum Disorders (Dr. Naama Barnea-Goraly: Simons Foundation)
Depressive Disorders in Breast Cancer Patients (Dr. Shelli Kesler: NIMH Innovator Award)
Cognition & neuroanatomy in sex chromosome aneuploidies (Dr. David Hong: NIMH K Award)
Estrogen replacement therapy and risk of Dementia (Dr. Natalie Rasgon: NIMH R01)

Impact of Sex Differences May Change Across the Lifespan

Schizophrenia: Peak for Men in Adolescence, Peak for Women in Menopause
Impact of Genetic Markers varies according to Sex and Stage of Lifespan (O’Hara et al 2006)

http://psychology.stanford.edu
Clinical Department
Psychiatry and Behavioral Sciences

Dept. Representative: Ruth O’Hara, Ph.D. Associate Professor

Figure 2: Interactive effect of COMT genotype and gender on Delayed Recall performance. Scores on WMS-R: Logical Memory Delayed Recall measure partitioned by genotype for Males (black bars) and Females (gray bars).

http://psychology.stanford.edu
COMMUNITY ENGAGEMENT

Focus on Sex Differences in the significant morbidity and mortality of Mental Health Disorders (Dr. Roberts)

EDUCATION

All Departmental Educational Efforts Emphasize Importance of Sex difference for
a) Understanding Variability Across Studies
b) Increasing our understanding of Etiology of Psychiatric Disorders

LEADERSHIP

VA Funded Grant to Investigate Success of Career Development Awardees and
How this is impacted by Sex (Drs. Finney and Cronkite)

http://psychology.stanford.edu
Clinical Department
Radiation Oncology

Department Chair: **Quynh-Thu Le, M.D.,** Katharine Dexter McCormick and Stanley McCormick Memorial Professor

Dept. Representatives: **Kathleen (Kate) Horst, M.D.,** Assistant Professor
**Elizabeth (Beth) Kidd, M.D.,** Assistant Professor

**Mission**
- To bring the most advanced care to our patients by being at the cutting edge of research and technology.

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

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

http://radonc.stanford.edu
Radiation Oncology Gender Specific Studies

Dept. Representatives: Kathleen (Kate) Horst, M.D., Assistant Professor
Elizabeth (Beth) Kidd, M.D., Assistant Professor

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
Radiation Oncology Gender Specific Studies

Dept. Representatives: Kathleen (Kate) Horst, M.D., Assistant Professor
Elizabeth (Beth) Kidd, M.D., Assistant Professor

GI/Gyn

- Female Sexual Dysfunction and Vaginal Dilator Therapy Following Pelvic Radiotherapy
- Tissue and Plasma Biomarkers of Lymph Node Involvement in Cervical Cancer
- Pilot Study to Evaluate the Prognostic Value of Perfusion CT for Primary Cervical Cancer
Clinical Department
Radiology

Department Chair: Sanjiv Sam Gambir, M.D. Virginia and D.K. Ludwig Professor for Clinical Investigation in Cancer Research
Dept. Representative: Sharon Pitteri, Ph.D., Assistant Professor

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 (3 primary sections): Radiological Sciences Laboratory (RSL), Molecular Imaging Program at Stanford (MIPS); Information Sciences in Imaging at Stanford (ISIS)

Education: Clinical & Research; Radiology Residency; Postdoctoral Fellowships

http://radiology.stanford.edu
Breast Imaging Section - dedicated to improving the health and lives of women by detecting and diagnosing breast cancer at its earliest stage using standard and emerging advanced diagnostic procedures, one woman at a time.

Interventional Radiology - has demonstrated that women on birth control pills who develop DVT present with a normal variant in venous anatomy (May-Thurner Syndrome) thereby significantly increasing their risk for DVT.

My Own Research
• Distinguishing women with benign versus malignant breast lesions
• Markers in the blood for breast and ovarian cancer early detection
• Underlying biological link between breast cancer and risk factors

Opportunities – Sex differences in cancer

http://radiology.stanford.edu
Clinical Department
Urology

Department Chair: Eila Skinner, M.D. Thomas A. Stamey Research Professor

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;
Fellowship in pediatric and female urology

Divisions: oncology, neurourology (incl female/infertility), peds

http://urology.stanford.edu
Clinical Department

Urology: current areas of interest/study

Linda M.D. Shortliffe, M.D. Stanley McCormick Memorial Professor:
- Sex hormones and gender differences affects on kidney and bladder development
- Dietary fructose in pregnancy

Eila Skinner, M.D.:
- Gender differences in outcomes of bladder cancer, hormonal effects on cancer biology
- Survivorship and quality of life for women after cystectomy

http://urology.stanford.edu
DEPARTMENTS for which Chair-designated Representative was not available for the September 27, 2013 Workshop

**Department Chair: listed**
Dept. Representative: **listed**

Department Mission slide may not have been revised
(based on information on website).

http://wsdm.stanford.edu
Mission:

Research: molecular analysis of fundamental biological questions

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

Education: research intensive Ph.D. with teaching experience

http://biochem.stanford.edu
Mission/Vision

- To understand how thousands of encoded proteins serve to bring about highly coordinated behavior of cells & tissues

Research Areas of Study:

- Structure/function analysis of ion channels & G-protein coupled receptors; molecular basis of sensory transduction, synaptic transmission, plasticity, and memory; role of ion channels & calcium in controlling gene expression in neural & immune cells; Regulation of vesicle trafficking & targeting, cell polarity, and cell-cell interactions in the nervous system and in epithelia.

Education: PhD (Graduate Studies of Biosciences); Postdoctoral Trainees

http://mcp.stanford.edu
Mission/Vision

Research Interests:

- Information processing in vertebrate retina; structure, function, and development of auditory and visual systems; development and regeneration in central and peripheral nervous system; neural mechanisms mediating higher nervous system functions, including perception, learning, attention and decision-making.

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

http://neurobiology.stanford.edu
Clinical Department
Neurology and Neurological Sciences

Department Chair: Frank Longo, M.D., Ph.D. George & Lucy Becker Professor
Dept. Representative: Michael Grecius, M.D. Assistant Professor

Vision/Mission to continue as a Center of Excellence, expanding comprehensive research and academic capabilities

DIVISIONS

• Autonomic Disorders
• Child Neurology
• Epilepsy
• Headache
• Memory Disorders
• Neuroimmunology & Multiple Sclerosis
• Neuro-oncology
• Neuromonitoring (IONM)
• Neuromuscular Disorders
• Neuropsychology
• Stroke & Neurocritical Care

http://neurology.stanford.edu
Clinical Department
Surgery

Department Chair: Thomas Krummel, M.D. Emile F. Holman Professor
Dept. Representative: Jill Helms, Ph.D. Professor (Plastic & Reconstructive)

Mission/Vision -

Research: from benchtop to international programs, furthers field of surgery through innovative basic science and clinical research
Labs/Programs: Asian Liver Center; CV Biomechanics Research Lab; Simulation; Genomic Breast Cancer Research; Hagey Laboratory; Transplant Immunology Lab; Surgery Center for Outcomes & Research Evaluation;
Education: from undergraduates to practicing physicians

Divisions

• General Surgery (Gastrointestinal Surg., Surg. Oncology, Trauma & Critical Care)
• Clinical Anatomy
• Emergency Medicine
• Plastic & Reconstructive Surgery
• Abdominal Transplantation
• Pediatric General Surgery
• Vascular Surgery

http://surgery.stanford.edu
DEPARTMENTS for which Chairs did not designate a Dept. Representative for September 27, 2013 Workshop

Department Mission slide may not have been revised (based on information on website).
Mission:

- to create a fusion of engineering and the life sciences that promotes scientific discovery and the development of new biomedical technologies and therapies through research and education (jointly supported by Schools of Medicine and of Engineering)

Research & Education:

- embrace biology as a new engineering paradigm
- apply engineering principles to medical problems & biological systems to advance human health, promote environmental sustainability, understand complex living systems

http://bioengineering.stanford.edu
Clinical Department
Cardiothoracic Surgery

Department Chair (Interim): Philip Oyer, M.D, Roy B. Cohn-Theodore A. Falasco Professor

Mission: Research & Education

Research Areas of Interest (Basic & Clinical):
- Cardiac Transplantation & Immunology
- Prevention & Treatment of Acute and Chronic Cardiac (& Lung) Transplant Rejection
- Prevention of Ischemic Cardiomyopathy

Educational Goals

Divisions: Adult, Pediatric, Thoracic

http://ctsurgery.stanford.edu
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 homeostasis, 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
Mission/Vision

- Committed to advancing the understanding and treatment of ocular disorders; collaborate to investigate the origins of ocular disease and devise new diagnostic and treatment modalities

Research Areas (span basic sciences & clinical care): retinal pathophysiology & genetics; retinal neurobiology & prosthetic vision; novel microsurgical tools & therapeutic lasers; advanced diagnostics & imaging; ophthalmic tissue engineering & corneal prosthetics; ocular microbiology & stem cells

Education: 3-yr residency of intensive clinical training while equipping participants with framework for translating latest research into patient care; encourages investigative research

http://ophthalmology.stanford.edu
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