



**Department of Obstetrics,
Gynecology and Reproductive
Biology**

**Michigan State University
College of Human Medicine**

Annual Report

January 1, 2020 – December 31, 2020

**Richard E. Leach, MD, FACOG, FACS
Professor and Chair**

<https://obgyn.msu.edu/>

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CHAIR'S REMARKS



Richard E. Leach, MD

The events of 2020 significantly impacted our personal and professional lives in unimaginable ways. Through their tireless work and commitment, University and College leadership instituted practices and policies that provided safe environments in which faculty, staff and students could continue their work and patients could receive uncompromised health care for which we are grateful. The following Departmental Annual Report reflects these accomplishments and our plans for continued sustainable growth. Department members, through their dedication, ingenuity and resilience enabled us to continue to achieve success in each of our missions of education, research, community engagement and clinical responsibilities.

Sincerely,

A handwritten signature in blue ink that reads "Richard E. Leach MD". The signature is written in a cursive, flowing style.

Richard E. Leach, M.D., FACOG, FACS
Professor and Chair
Department of Obstetrics, Gynecology and Reproductive Biology
College of Human Medicine
Michigan State University

MISSION

The mission of the Department of Obstetrics, Gynecology and Reproductive Biology is to improve the lives of women by:

- Fully integrating research, education, and clinical care across a woman's health continuum – from birth through the reproductive years and post menopause – with expertise maximizing diversity, health equity and inclusion that will improve clinical care and research in obstetrics, gynecology and reproductive health for all.
- Working across all four levels of the clinical translational research continuum (T0 - T4) that includes basic, pre-clinical, efficacy, effectiveness, dissemination and implementation research, as well as translation to policy and to communities.
- Providing the highest level of education and training to medical and graduate students, residents, clinical and postdoctoral fellows, attending physician and early career postgraduate faculty, and other healthcare providers in a collegial and productive professional environment.

DEPARTMENT FACULTY, STAFF AND TRAINEES

The Department of Obstetrics, Gynecology and Reproductive Biology's work and achievements for 2020 was driven by its faculty, staff and trainees' dedication to our departmental mission.

Research Faculty

Department research faculty are housed in Grand Rapids, East Lansing and Flint in state-of-the-art research facilities including the Grand Rapids Research Center (GRRC), Secchia Center, Institute for Quantitative Health Science and Engineering (IQ), Interdisciplinary Science & Technology Building (ITSB) and the Flint Press Building. Additionally, the department has 15 adjunct research faculty who are represented within the state, country and internationally.

Our faculty and staff from all three academic campuses (Grand Rapids, East Lansing, and Flint) began work-from-home due to the Covid-19 Pandemic on March 16, 2020. Essential on-site work within the laboratories of the GRRC in Grand Rapids and the IQ building in East Lansing resumed during Summer 2020 under the strict social distancing and essential work guidelines set across MSU. Work-from-home for all activities that do not demand in-building access will continue through at least the Summer of 2021. As highlighted in this report, our Department has remained productive during these unprecedented times, with **expanded** scientific discoveries; research publications; grant proposal submissions and procured funding. College, University and community education, and clinical care successes has also flourished.

Clinical Faculty

The Department serves a statewide community-based footprint of the College of Human Medicine. This hub and spokes model differentiates our Department that is served by over 200 Clinical Faculty who mentor and teach our students and collaborate on clinical translation of research discoveries. This dedicated clinical faculty provide durable partnerships within our communities and health system partners across the state (Figure 1; Table 1)

Figure 1. MSU College of Medicine Community Campuses

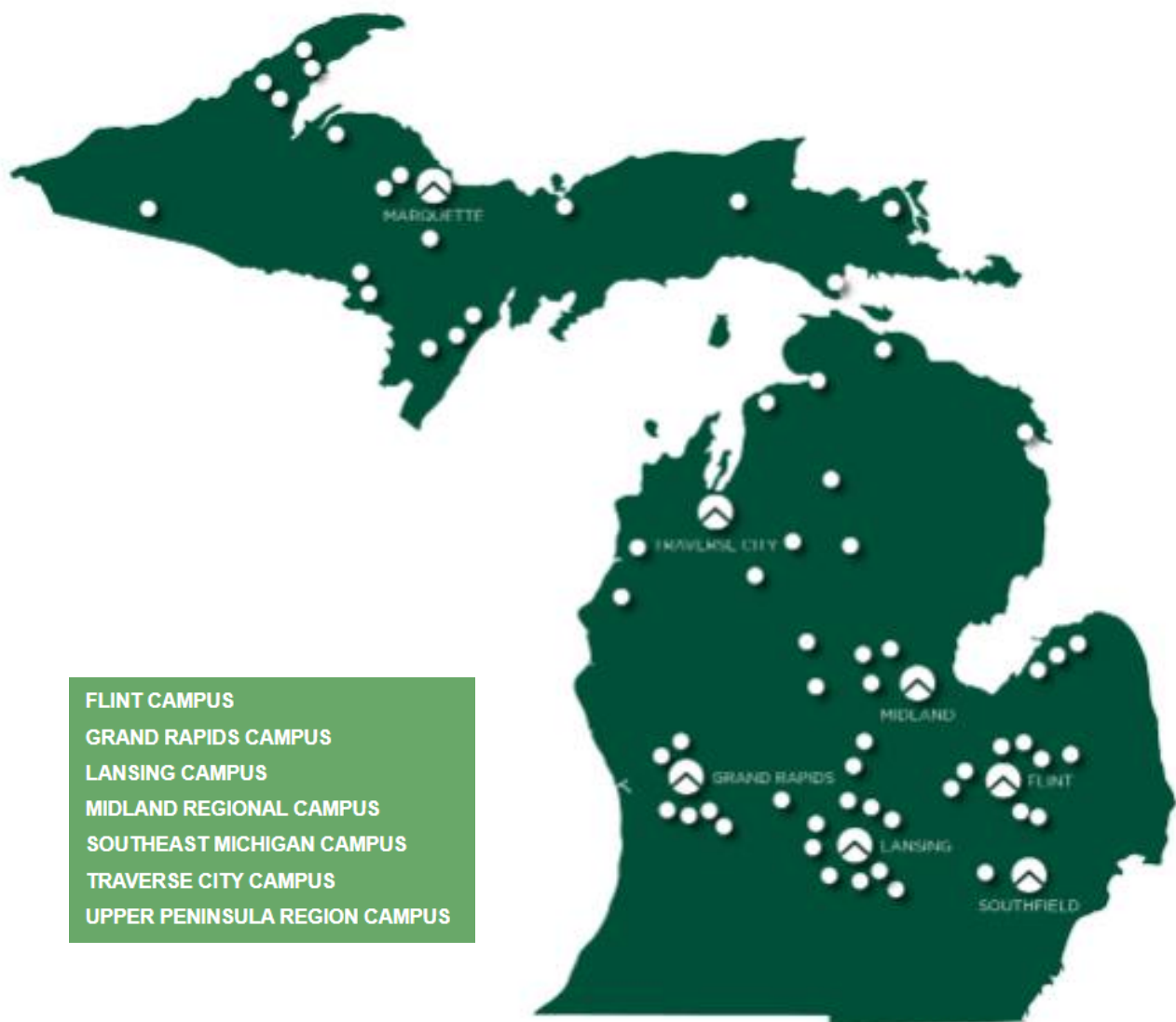


Table 1. Community Clinical Faculty

Abuzeid, Mostafa	Gupta, Subhash	O'Brien, Elvira
Ahmad, Saqib	Hakim, Paul	O'Hagan, Alissa
Allswede, Matthew	Halvorson, Melissa	Oldenberg, Kristin
Andersson-Zetye, Lisa	Hamilton, Kelly	Parini, Casey
Arnold, Sarah	Hammad, Adnan	Park, Rosemary
Ashraf, Mohammad	Hardas, Mona	Pezeshki, Soheyla
Backus Walzer, Michelle	Harold, Patrice	Pilbeam, Rosalie
Baig, Saba	Harris, Ebonie	Platte, Raisa
Balaskas, Thomas	Harrison, Charles	Politis, Eugenia
Barton, James	Hawkins, Jennifer	Pond, Breanna
Bates, Richard	Hebert, John	Prezzato, Joseph
Battel, Virginia	Herman, Michelle	Pugmire, Mary
Bayne, Melissa	Hill, Marissa	Rao, Sandeep
Becher, Michelle	Hoekstra, Erinn	Rasool, Nabila
Bedore, Nicole	Hoffman, Jennifer	Regal, Clara
Behring, Leigh	Holmes, Jay	Reinke-Young, Michelle
Bennett, Sejal	Houle, Jorrie	Rocha, Frederico
Bibicoff, Melissa	Hummel, Christopher	Romero Romero, Vivian
Bitner, Diana	Jeakle, James	Roth, Steven
Boike, Guy	Jentoft, Eric	Roumaya, Nadine
Bollin-Richards, Brooke	Johnson, Thomas	Ruple, Shawna
Borson, Jennifer	Joshi, Chandrika	Ryan, Adam
Bradley, Barbara	Joshua, Ayodeji	Salama, Mahmoud
Bump, Peter	Kalra, Veena	Schluckebier, Paul
Burke, Lori	Kaplan, Jennifer	Schmidt, Caitlin
Caldwell, Rebecca	Kelley, Sharon	Schoenberger, Alvin
Caruso, Jennifer	Khedr, Mohamed	Schoenmaker, Martin
Cazan-London, Gianina	Kirkwood, Alysha	Seamon, Leigh
Cherukuri, Lavanya	Koskela, Kristin	Serou, Alice
Cheshier-Alvarado, Jeanne	Kowalczyk, Carole	Shah, Nima
Chobanian, Nishan	Kreuze, David	Shah, Upendra
Chwalisz, Kristof	Kroll, Natalie	Sharma, Shefali
Clarke, David	Kurtz, Debra	Shastri Bertucci, Nisha
Collins, Michael	Lagattuta, David	Shavell, Valerie
Colombo, David	Laws-Barker, Alane	Shen, Hui
Conboy, Brendan	Leary, Elizabeth	Slone, Tracy
Cook, Robert	Lee, Dong	Snyder, Lindsay
Cordoba-Munoz, Marcos	Lepisto, Brenda	Song, Haengseok
Cottingham, Jane	Lessey, Bruce	Sternschuss, Gina

Craig, Jordan	Levashkevich, Alexey	Storms, Ashley-Ann
Craig, Jean	Levitt, Valerie	Strong, Sarah
Cramton, Sara	Lewis, Mark	Sturdivant, Angela
Cummiskey, Karen	Lieberman, John	Sung, Sharon
Dalm, Stephen	Ligon, Dorsey	Taber, Rodman
Debono, Jeanne	London, Kevin	Takyi, Frank
Deighton-Collins, Sarah	Long, Robert	Tatar Kurt, Ahsen
Dodds, Robert	Madion, Timothy	Thakur, Mili
Dodds, William	Marras, Angela	Thiel, Lisa
Doherty, Laura	Martin, Denny	Thiele, Scott
Dood, Jeffrey	Maslovich, Mark	Thomas, Elizabeth
Fellenbaum, Theodore	Mattson, Sarah	Thomas, Michele
Fleming, Stephanie	Mcghee, Kania	Thompson, Keri
Flora, Robert	Mcgraw, Nicole	Tsimis, Michael
Freeburger, Lara	Mckay, Douglas	Tucker, Lakeeya
Fricke, Erin	Mckeel, Donald	Van Slooten, Andrew
Friedman, Jaclyn	Mclean, Amber	Verplanck-Kanitz, Marcy
Frye, Ira	Menapace, David	Voutsos, Lester
Gago, Laura	Meulenberg, Amanda	Watson, Lydia
Gary, Monica	Meunier, Joseph	Werback, Kelly
Gentry, Dannie	Michelin, David	Whittington, Jeremiah
Gibbie, Jessica	Miller, Sharon	Wiersema, Kelly
Giuliani, Emma	Moore, Kimberly	Wolfe, Cheryl
Gonzalez, Luis	Moossavi, Leyla	Wright, Kurt
Gordon, Tess	Morreale, Stephanie	Young, Omari
Gorsuch, Kerry	Moser, Steve	Young, James
Graf, Sherri	Mullings-Britton, Janet	Zakhour, Mae
Griffin, Angela	Naik, Urva	Zilo, Crystal
Griffin, Meghan	Nair, Sankar	Zwain, Omar
Guerin, Maude	Navas, Manuel	Zylstra, Trisha
Gundamraj, Narasimha	Newman, Alan	

Departmental members and its organization are identified within the departmental organization chart. Our department is a gender diverse group with women representing 46% of our faculty. We were very fortunate to have exceptional nationally recognized faculty join the department in 2020. Recruitment of several of our faculty this year have been in partnership with Drs. Debra Furr-Holden, Director, Division of Public Health and Christopher Contag, Director, Institute for Quantitative Health Science and Engineering.

Faculty who joined our Department in 2020

Provost Teresa K. Woodruff, PhD, is an internationally recognized expert in ovarian biology and, in 2006, coined the term “oncofertility” to describe the merging of two fields: oncology and fertility. Woodruff holds more than 10 U.S. Patents and was elected to the National Academy of Inventors (2017). She has been active in education not only at the professional level but also with high school students. To this end, she founded the Oncofertility Saturday Academy (OSA), one of several high school outreach programs that engages girls in basic and medical sciences. For this work, she was awarded the Presidential Award for Excellence in Science Mentoring in an Oval Office ceremony by President Obama (2011).

Dr. Steven Ondersma, PhD, joins us from the Departments of Psychiatry & Behavioral Neurosciences and Obstetrics & Gynecology at Wayne State University. His primary interest is in computer-delivered assessment and motivational interventions for substance use and other risk factors among pregnant and postpartum women. He is a Fellow of the American Psychological Association (Division 37), former Editor of the journal *Child Maltreatment*, and a member of the Motivational Interviewing Network of Trainers. He has served as an invited presenter for numerous NIH topical meetings as well as for the White House Office of National Drug Control Policy and the Institute of Medicine. He has been PI on multiple NIH/CDC research grants focusing on the development and validation of novel screening techniques and technology-based brief interventions.

Dr. Bin Gu received his Ph.D. in Cell Biology from the College of Life Sciences at Zhejiang University in China in 2013. There he discovered the expression and function of the Autoimmune Regulator (Aire) gene in embryonic stem (ES) cells. In 2013, he moved to Toronto for his postdoctoral training in Dr. Janet Rossant’s Laboratory at SickKids Research Institute. During his postdoctoral training, he continued to study the function of Aire in early mouse embryos and revealed a novel function of Aire in mitotic spindle assembly in ES cells and early embryos, and provided a plausible explanation for the fertility defect in AIRE mutant APECED patients and Aire knockout mice. Recently, Dr. Gu has developed 2C-HR-CRISPR, a transformative technology for complex genome editing in mice.

Dr. Cara Poland, MD, M.Ed, FACP, DFASAM, trained in internal medicine at St. Joseph Mercy Hospital in Ann Arbor, Michigan and fellowship training in addiction medicine at Boston Medical Center. She has an interest in educating healthcare providers and providers-in-training to improve care for patients with substance use disorders and alcohol use disorders through her work on MI CARES and with various professional organizations. She is the Past President of the Michigan Society of Addiction Medicine. She is the medical director of addiction medicine at Spectrum Health and collaborates with other providers in Spectrum Health’s GREAT MOMs program to treat pregnant women with substance use disorders.

Dr. Jayson Field, MD, joins us from Oakland University William Beaumont School of Medicine and William Beaumont Hospital’s Division of Gynecologic Oncology. Dr. Field’s

goal as a board-certified gynecologic oncologist is to provide excellent care for women with gynecologic cancers with surgery, chemotherapy, and coordination of radiation treatment. He specializes in care of cervical, vulvar, endometrial (or uterine), and ovarian cancers and is interested in minimally invasive surgery, fertility preservation, and cytoreduction of ovarian cancers. Dr. Field will be practicing in East Lansing with affiliations to McLaren and the Karmanos Cancer Institute.

Dr. Mahmoud Salama, MD, PhD joins us from Northwestern University. Dr. Salama received his MBBCh of Human Medicine and Surgery, OBGYN residency program, OBGYN MSc, and OBGYN MD from Cairo University, Egypt. Dr. Salama earned his PhD from Medical University of Innsbruck in Gynecological Endocrinology, Reproductive Medicine and Oncofertility. He has also received a Master of Arts in Business (MA) in International Healthcare Management from Management Center in Innsbruck (MCI). Dr. Salama will direct the Oncofertility Consortium at MSU.

We had a single departure this year from among our faculty. Dr. Karen Racicot, PhD will advance her career to serve as the North American Director and Medical Science Liaison for Women's Health at Quest Diagnostics, beginning January 2021. The department looks forward to continued collaboration with Dr. Racicot in her new role at Quest Diagnostics and wish her continued success in this prestigious new role as she continues to advance the health and wellbeing of women.

DEPARTMENT EDUCATION AND TRAINING

- **Undergraduate Medical Education**

The Shared Discovery Curriculum (SDC) was fully implemented for its 4th class of 365 CHM students in 2020. Drs. Richard Leach and Anita Avery led the Women's Health Curriculum Development and Teaching for the Middle Clinical Experience (MCE; or 187 second year students) and Late Clinical Experience (LCE; or 178 third year students respectively).

Department faculty contributed over 1800 hours of teaching this past year. Dr. Avery serves as Lead Clerkship Director for our 7 community campuses throughout the state (figure 1). The departments community clinical faculty play an essential role in the education, training, and mentorship of our students in the LCE across the state (Table 1).

In 2020, the Department added an Early Curriculum Experience (ECE) under the leadership of Drs. Freidhoff and Colon-Berlingeri, to introduce first year students to pelvic anatomy and reproductive endocrinology and embryology.

- **Medical Student and Residency Education**

The Department leads the MSU CHM Affiliated Obstetrics and Gynecology Residency Network (AOGRN) of four Accreditation Council for Graduate Medical Education (ACGME) approved residency programs including Ascension Providence, Hurley Medical Center, Sparrow Health and Spectrum Health System. This represented 88 residents in 2020. In the educational work that is done in AOGRN we are one of the largest residency programs in the country. Dr. Avery is Co-Program Director for the Sparrow residency program in Lansing. AOGRN sponsors an annual intern “bootcamp” each July. The purpose of the bootcamp is to introduce interns to resident expectations, wellness, strategies to approach their careers during residency training. This year included in the bootcamp was an Implicit Bias Workshop led by expert faculty and a nationally recognized guest speaker that will be expanded into a yearlong training program in 2021.

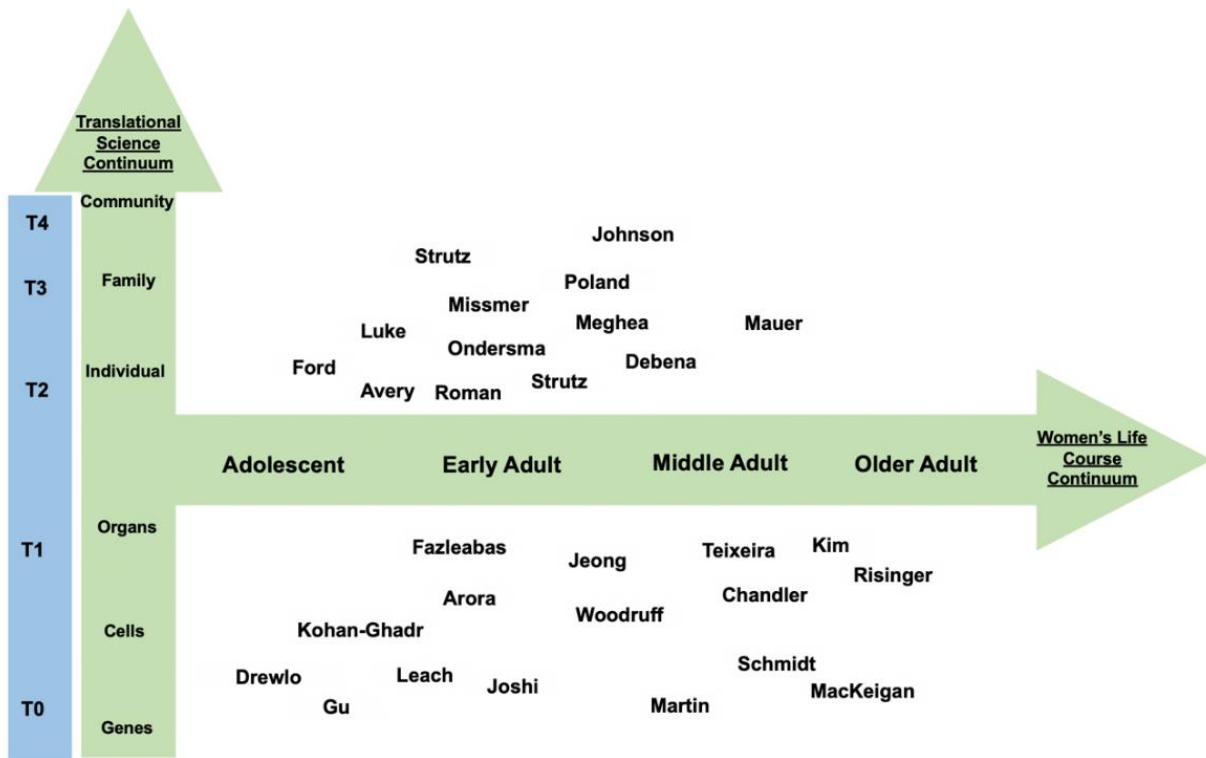
- **Graduate Student Education and Postdoctoral Training**

The Department is a nationally recognized leader in obstetrics, gynecology, and reproductive medicine research whose faculty provides graduate student training and mentorship. Six graduate students are continuing their doctoral training in the department in 2020, four of whom have been awarded NIH F32-31 Fellowships and two are MSU CHM MD-PhD Students. The Department faculty currently are training ten post-doctoral fellows, mentoring them for the next stage of their careers. Dr. Asgerally Fazleabas is Co-Director of the NIH supported MSU T-32 Reproductive and Developmental Sciences Training Program of which there are only a handful nationally. The Department has created a robust research seminar series over the last seven years (Table 6). The seminar series brings recognized experts from around the country to interact with our students and research fellows and provides trainees the forum and experience to present their research.

DEPARTMENT RESEARCH PROGRAM

The Department is home to nationally and internationally renowned scientists dedicated to cutting-edge innovation and leadership in clinical translation to improve the health of the patients and communities that we serve. The diverse research of our faculty encompasses the entirety of a women’s life course continuum and includes the translational science continuum from T0 to T4 (Figure 2).

Figure 2. Mapping of Department Research Areas Across a Women’s Life Course Continuum by Translational Science Continuum Approach (T0-T4)



We have accomplished researchers across the many disciplines of women’s health, including clinical translational scientists, physicians, nurses, psychologists, sociologists, physiologists, cell biologists and epidemiologists focused not only on the medical aspects, but also on the health care and public health inequities that threaten women’s health.

- **Research Funding**

The Departmental research funding significantly increased in 2020 with a 50% increase in NIH funding and 100% increase in non-federal grants and contracts (Table 2). Our exceptional researchers were awarded NIH funding, as found in NIH RePORT, \$9,852,995 with the department being ranked 5th nationally for NIH funding. Department faculty also received grants and contracts totaling \$5,444,051. This substantial growth represents several underlying factors including Principal Investigator accomplishment and reputation, consistent exceptional scores from study section review for Investigator and Environment criteria, continued support from our invaluable CHM pre-award office led by Erin Gorman, and high impact publications supporting grant applications (Tables 3, 4, 5).

GRANTS AND CONTRACTS

Table 2. Individual Investigator Grants Newly Awarded in 2020

PI	Sponsor	Title/Description	Amount	Start Date	End Date
Lee Anne Roman, PhD	MDHHS	Strong Beginnings: Care Improvement for African American and Latina Women	\$1,268,868	1/1/2020	9/30/2021
Jeffrey MacKeigan, PhD	Erasca	Therapeutically targeting novel mechanisms for precision oncology	\$547,750	1/1/2020	12/31/2021
Cristian Meghea, PhD	HRSA - Spectrum Health System	Alliance for Innovation on Maternal Health Community Care Initiative (AIM CCI)	\$106,921	4/1/2020	9/30/2024
Jose Teixeira, PhD	NIH	Myometrial stem cells	\$430,375	6/1/2020	5/31/2022
Jae Wook Jeong, PhD	Society for Reproductive Investigation	Nonsteroidal treatment for endometriosis	\$20,000	7/1/2020	6/30/2021
Jose Teixeira, PhD	NIH	Stem cell epigenetics in uterine fibroids	\$464,333	7/1/2020	6/30/2022
Sascha Drewlo, PhD	MSU CHM	2020 Jean P. Schultz Biomedical Research Endowment Award	\$30,000	7/1/2020	6/30/2021
Stacey Missmer, ScD	University of Arizona (NIH)	Endometriosis, Infertility & Risk of Stroke	\$74,938	7/1/2020	6/30/2022
Ripla Arora, PhD	March of Dimes	Effects of Non-steroidal Anti-inflammatory Drugs on Uterine 3D Structure and Pregnancy Outcomes	\$150,000	7/1/2020	6/30/2022
Cristian Meghea, PhD	NIH	A Smartphone Intervention for Pregnancy Smoking Cessation with Peer Support	\$380,865	8/6/2020	7/31/2022
Jennifer Johnson, PhD	NIH	IPT for major depression following perinatal loss	\$3,358,550	8/7/2020	7/31/2025

Jae Wook Jeong, PhD	NIH	Molecular mechanisms of endometrial progesterone resistance	\$2,657,839	8/15/2020	4/30/2025
Ryan Marquardt	NIH	The role of ARID1A in endometriosis-related infertility	\$108,907	8/16/2020	8/15/2023
Jennifer Johnson, PhD	NIH	Meeting women where they are: Multilevel intervention addressing racial disparities in maternal morbidity and mortality	\$3,909,863	9/14/2020	4/30/2025
Jens Schmidt, PhD	NIH	Single-molecule Analysis of the DNA Damage Response in Living Cells	\$2,137,302	9/30/2020	5/31/2025
Kelly Strutz, PhD Cara Poland, MD	MDHHS	State Opioid Relief for Use Disorders	\$1,329,765	10/1/2020	9/30/2021
Gregory Burns, PhD	NIH	Biological Roles of Forkhead Box C1 in Pelvic Endometriosis	\$65,310	12/2/2020	12/1/2021

List of all current grants and contracts found [here](#).

Table 3. Individual Investigator Manuscripts

1. Wu Y, He JP, Xie J, Wang KZ, Kang JW, **Fazleabas AT**, Su RW. Notch1 is crucial for decidualization and maintaining the first pregnancy in the mouse†. Biol Reprod. 2020 Dec 8;ioaa222. Epub ahead of print. PMID: 33284968.
2. Rogers HB, Zhou LT, Kusuvara A, Zaniker E, Shafaie S, Owen BC, Duncan FE, **Woodruff TK**. Dental resins used in 3D printing technologies release ovo-toxic leachates. Chemosphere. 2020 Dec 7;270:129003. PMID: 33515896.
3. **Flores D, Madhavan M**, Wright S, **Arora R**. Mechanical and signaling mechanisms that guide pre-implantation embryo movement. Development. 2020 Dec 21;147(24):dev193490. PMID: 33158924.
4. **Ford S**, Tarraf W, Williams KP, **Roman LA, Leach R**. Differences in cervical cancer screening and follow-up for black and white women in the United States. Gynecol Oncol. 2020 Dec 12:S0090-8258(20)34155-X. Epub ahead of print. PMID: 33323276.
5. **Hailemariam M**, Pathare S. The missing global in global mental health. Lancet Psychiatry. 2020 Dec;7(12):1011-1012. PMID: 33220190.

6. Towner EK, Idalski Carcone A, Ghosh S, **Ondersma S**, Stylianou M. Adapting pharmacological dose-finding designs for early phase behavioral intervention development research. *Health Psychol.* 2020 Nov 5. Epub ahead of print. PMID: 33151725.
7. Sapoznik E, Chang BJ, Huh J, Ju RJ, Azarova EV, Pohlkamp T, Welf ES, **Broadbent D**, Carisey AF, Stehbens SJ, Lee KM, Marín A, Hanker AB, **Schmidt JC**, Arteaga CL, Yang B, Kobayashi Y, Tata PR, Kruithoff R, Doubrovinski K, Shepherd DP, Millett-Sikking A, York AG, Dean KM, Fiolka RP. A versatile oblique plane microscope for large-scale and high-resolution imaging of subcellular dynamics. *Elife.* 2020 Nov 12;9:e57681. PMID: 33179596; PMCID: PMC7707824.
8. **Meghea CI**. Electronic Nicotine Delivery Systems Use and Cigarette Smoking Frequency and Intensity Among Young Adult Smokers. *JAMA Netw Open.* 2020 Nov 2;3(11):e2016121. PMID: 33231632.
9. Farland LV, Stern JE, Hwang SS, Liu CL, Cabral H, Knowlton R, Gershman ST, Coddington CC 3rd, **Missmer SA**. Early-life cancer, infertility, and risk of adverse pregnancy outcomes: a registry linkage study in Massachusetts. *Cancer Causes Control.* 2020 Nov 27. Epub ahead of print. PMID: 33247354.
10. **Wilson MR, Reske JJ**, Holladay J, **Neupane S**, Ngo J, Cuthrell N, Wegener M, Rhodes M, Adams M, Sheridan R, Hostetter G, Alotaibi FT, Yong PJ, Anglesio MS, Lessey BA, **Leach RE, Teixeira JM, Missmer SA, Fazleabas AT, Chandler RL**. ARID1A Mutations Promote P300-Dependent Endometrial Invasion through Super-Enhancer Hyperacetylation. *Cell Rep.* 2020 Nov 10;33(6):108366. doi: 10.1016/j.celrep.2020.108366. PMID: 33176148; PMCID: PMC7682620
11. **Marquardt RM, Jeong JW, Fazleabas AT**. Animal Models of Adenomyosis. *Semin Reprod Med.* 2020 May;38(2-03):168-178. Epub 2020 Oct 26. PMID: 33105508.
12. Xu J, Wang Y, Kauffman AE, Zhang Y, Li Y, Zhu J, Maratea K, Fabre K, Zhang Q, **Woodruff TK**, Xiao S. A Tiered Female Ovarian Toxicity Screening Identifies Toxic Effects of Checkpoint Kinase 1 Inhibitors on Murine Growing Follicles. *Toxicol Sci.* 2020 Oct 1;177(2):405-419. doi: 10.1093/toxsci/kfaa118. PMID: 32697846; PMCID: PMC7778340.
13. Markovitz AR, Haug EB, Horn J, Fraser A, Tilling K, Rimm EB, **Missmer SA**, Williams PL, Romundstad PR, Åsvold BO, Rich-Edwards JW. Normotensive preterm delivery and maternal cardiovascular risk factor trajectories across the life course: The HUNT Study, Norway. *Acta Obstet Gynecol Scand.* 2020 Oct 6. doi: 10.1111/aogs.14016. Epub ahead of print. PMID: 33022746.
14. Edmonds ME, Forshee MD, **Woodruff TK**. Extra Cellular Matrix-Based and Extra Cellular Matrix-Free Generation of Murine Testicular Organoids. *J Vis Exp.* 2020 Oct 7;(164). doi: 10.3791/61403. PMID: 33104061.
15. Sha Q, Achtyes E, Nagalla M, Keaton S, Smart L, **Leach R**, Brundin L. Associations between estrogen and progesterone, the kynurenine pathway, and inflammation in the post-partum. *J Affect Disord.* 2020 Oct 29;281:9-12. doi: 10.1016/j.jad.2020.10.052. Epub ahead of print. PMID: 33278766.

16. **Marquardt RM, Kim TH**, Yoo JY, Teasley HE, **Fazleabas AT**, Young SL, Lessey BA, **Arora R, Jeong JW**. Endometrial epithelial ARID1A is critical for uterine gland function in early pregnancy establishment. *FASEB J*. 2020 Nov 22. doi: 10.1096/fj.202002178R. Epub ahead of print. PMID: 33222288.
17. Upton K, **Missmer SA**. Epidemiology of Adenomyosis. *Semin Reprod Med*. 2020 Oct 26. doi: 10.1055/s-0040-1718920. Epub ahead of print. PMID: 33105509.
18. **Ford S**, Peterson CE, Whiteley J, Kiviniemi MT, Martin MY, Carpenter KM, Whitt-Glover MC, Jacob Arriola KR. Using a group development framework to maximize leadership strategies in the inaugural session of the Society of Behavioral Medicine Leadership Institute. *Transl Behav Med*. 2020 Oct 8;10(4):877-883. doi: 10.1093/tbm/ibaa068. PMID: 33030527.
19. **Marquardt RM**, Lee K, **Kim TH**, Lee B, DeMayo FJ, **Jeong JW**. Interleukin-13 receptor subunit alpha-2 is a target of progesterone receptor and steroid receptor coactivator-1 in the mouse uterus†. *Biol Reprod*. 2020 Oct 5;103(4):760-768. doi: 10.1093/biolre/iaaa110. PMID: 32558878; PMCID: PMC7569349.
20. Yoo JY, Ku BJ, **Kim TH**, Il Ahn J, Ahn JY, Yang WS, Lim JM, Taketo MM, Shin JH, **Jeong JW**. β -catenin activates TGF- β -induced epithelial-mesenchymal transition in adenomyosis. *Exp Mol Med*. 2020 Oct;52(10):1754-1765. doi: 10.1038/s12276-020-00514-6. Epub 2020 Oct 15. PMID: 33060769.
21. **Luke B**, Brown MB, Nichols HB, Schymura MJ, Browne ML, Fisher SC, Forestieri NE, Rao C, Yazdy MM, Gershman ST, Ethen MK, Canfield MA, Williams M, Wantman E, Oehninger S, Doody KJ, Eisenberg ML, Baker VL, Lupo PJ. Assessment of Birth Defects and Cancer Risk in Children Conceived via In Vitro Fertilization in the US. *JAMA Netw Open*. 2020 Oct 1;3(10):e2022927. PMID: 33119107.
22. de Man AM, Rashedi A, Nelen W, Anazodo A, Rademaker A, de Roo S, Beerendonk C, **Woodruff TK**. Female fertility in the cancer setting: availability and quality of online health information. *Hum Fertil (Camb)*. 2020 Sep;23(3):170-178. doi: 10.1080/14647273.2018.1506891. Epub 2018 Sep 19. PMID: 30230389.
23. Lewis Johnson TE, Clare CA, **Johnson JE**, Simon MA. Preventing Perinatal Depression Now: A Call to Action. *J Womens Health (Larchmt)*. 2020 Sep;29(9):1143-1147. Epub 2020 Jul 30. PMID: 32749917.
24. Eisenberg ML, **Luke B**, Cameron K, Shaw GM, Pacey AA, Sutcliffe AG, Williams C, Gardiner J, Anderson RA, Baker VL. Defining critical factors in multi-country studies of assisted reproductive technologies (ART): data from the US and UK health systems. *J Assist Reprod Genet*. 2020 Nov;37(11):2767-2775. Epub 2020 Sep 30. PMID: 32995971; PMCID: PMC7642045.
25. Jackson-Bey T, Colina J, Isenberg BC, Coppeta J, Urbanek M, Kim JJ, **Woodruff TK**, Burdette JE, Russo A. Exposure of human fallopian tube epithelium to elevated testosterone results in alteration of cilia gene expression and beating. *Hum Reprod*. 2020 Sep 1;35(9):2086-2096. doi: 10.1093/humrep/deaa157. PMID: 32756960; PMCID: PMC7550267.

26. Bailey AP, Hill AS, Beste MT, Cook CD, Sarda V, Laufer MR, Isaacson KB, Griffith LG, **Missmer SA**. Comparison of cytokines in the peritoneal fluid and conditioned medium of adolescents and adults with and without endometriosis. *Am J Reprod Immunol*. 2020 Sep 18:e13347. Epub ahead of print. PMID: 32946598.
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111. Hendrix, P., Tang, Z., Silasi, M., **Racicot, K. E.**, Mor, G., Abrahams, V. M., & Guller, S. (2020). Herpesvirus-infected hofbauer cells activate endothelial cells through an IL-1 β -dependent mechanism. *Placenta*, 91, 59-65.

List of faculty manuscripts from 2017-2019 found [here](#).

Table 4. Faculty Awards and Recognition

PI	Sponsor	Title/Description
Sascha Drewlo, PhD	MSU	JP Schultz Award Biomedical Research Endowment
Jennifer Johnson, PhD	MSU	Junior Faculty Mentoring Award
Ronald Chandler, PhD	MSU	Early Career Research Excellence Award
Asgerally Fazleabas, PhD	Society for the Study of Reproduction	Carl G. Hartmann Award
Teresa K Woodruff, PhD	Endocrine Society	Gerald D. Aurbach Award for Outstanding Translational Research
Asgerally Fazleabas, PhD	University of Illinois at Urban-Champaign	College of Agriculture Consumer and Environmental Sciences (ACES) Alumni Association Career Achievement Award
Jens Schmidt, PhD	NIH	New Innovator Award

Table 5. Faculty Review Service for Federal Granting Agencies

PI	Review Service for Federal Granting Agencies
Ripla Arora, PhD	NIH, Early Career Grant Reviewer Cellular Molecular and Integrative Reproduction (Feb 2021)
	NIH, Institutional Research and Academic Career Development Awards (IRACDA) postdoc fellowship reviewer for University of California Santa Cruz (Sept 2020/Sept. 2021)
Ronald Chandler, PhD	NIH, Ad hoc peer review, Integrative and Clinical Endocrinology and Reproduction Biology (ICER) study section.
	Peer Review Committee Member, American Cancer Society
	Peer Review Committee Member, Department of Defense-Congressionally Directed Research Program
	Peer Review Medical, Endometriosis.
	Peer Review Committee Member, Target Ovarian Cancer
Sascha Drewlo, PhD	NIH, Ad hoc Grant Reviewer, Pregnancy and Neonatology (PN) Study Section
Asgi Fazleabas, PhD	NIH, Member, Endocrinology, Metabolism, Nutrition and Reproductive Sciences Study Section (2020).
	Chair, Society for Reproductive Investigation Grants Committee
Jae Wook Jeong, PhD	NIH, Member, Pregnancy & Neonatology (PN) Study Section
	NIH, Grant Reviewer ZHD1 DSR-G (02)
	Review Committee for Mary Kay Foundation Cancer Research Grant
	Reviewer for postdoctoral fellowship application, the Research Foundation Flanders (FWO), France
	Expert Reviewer, the Research Foundation Flanders (FWO), France,
	Member Conflict SEP in reproductive, biobehavioral and population sciences

Jennifer Johnson, PhD	NIH, Grant Reviewer: CSR Community-level health promotion (CLHP) student section
	CSR Dissemination and Implementation Research in Health (DIRH)/Science of Implementation
	NIH, Standing Member, Committees in Health and Healthcare (SIHH) Study Section,
	Scientific Advisor for the National Foundation for Suicide Prevention
Reza Kohan-Ghadr, PhD	NIH, Grant Reviewer on Special Emphasis Panel/Scientific Review Group. Cellular, Molecular and Integrative Reproduction (CMIR) meeting, Center for Scientific Review
	Review committee member, Society for Study of Reproduction (SSR) meeting, Jul. 2020, Ottawa, Ontario, Canada
Richard Leach, MD	NIH, National Institute of Child and Human Development (NICHD) Reproduction, Andrology and Gynecology Subcommittee (CHHD-R) 2020-2025
Barbara Luke, PhD	NIH, Grant Reviewer Health Services Quality and Effectiveness (HSEQ) Study Section
Jeff MacKeigan, PhD	Grant Reviewer, Tuberous Sclerosis Alliance-2020
Steve Ondersma, PhD	Chair, NIH Centers for Scientific Review Special Emphasis Panel on Addiction Risks and Treatment, ZRG1 RPHB-V01 M-July 2020
	Reviewer for PPAH, Population and Public health Approaches to HIV/AIDS-March 2020
	NIH, Ad-hoc reviewer for AA2, Epidemiology, Prevention, and Behavior Research Subcommittee of the National Institute of Alcohol Abuse and Alcoholism-2018-present
Jens Schmidt, PhD	NIH, Early Career Reviewer on Molecular Structure and Function C Study Section
Jose Teixeira, PhD	NIH, Member grant review panel (RAG) Special Emphasis Panels
	DOD Ovarian Cancer

Table 6. Department Research in Progress Seminars

Speaker	Affiliate	Date	Series	Title/Description
Ariadna Ochoa-Bernal	MSU	January 8, 2020	Departmental RIP Presentation	"Inflammatory regulation of miR-21 and fibrosis in the pathophysiology of endometriosis"
Sabrina Ford	MSU	January 22, 2020	Departmental RIP Presentation	"Clinical Outcomes of Follow-up to Abnormal Pap"
Ryan Marquardt	MSU	January 29, 2020	Departmental RIP Presentation	"IL13RA2: a Uterine Progesterone Receptor Target Important for Decidualization"
Emmanuel Paul, PhD	MSU	February 5, 2020	Departmental RIP Presentation	"Strategy to Identify New Markers of Myometrial Stem Cells for Understanding the Pathogenesis of the Uterine Fibroid"
Christian Meghea, PhD	MSU	February 12, 2020	Departmental RIP Presentation	"Precision Home Visiting and Maternal-Infant Care and Health Outcomes"
Julie Sroga Rios, MD	Cincinnati Children's Hospital Medical Center and the University of Cincinnati	February 19, 2020	Michigan State University and Spectrum Health Medical Group Professor Program	"Updates and Controversies in Fertility Preservation"
Joshua Grey	MSU	February 26, 2020	Departmental RIP Presentation	"Site-specific CpG methylation in uterine fibroid cell line"

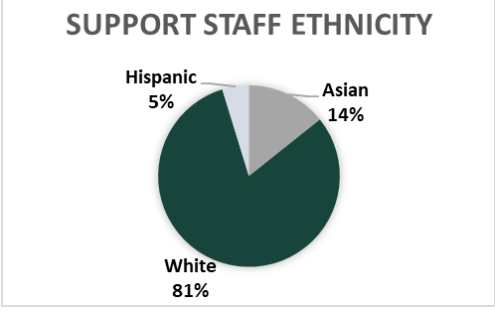
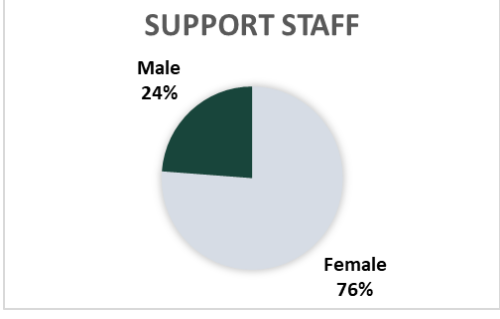
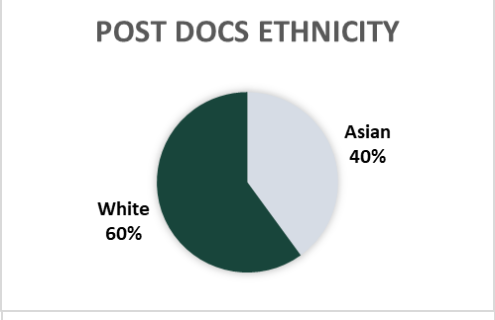
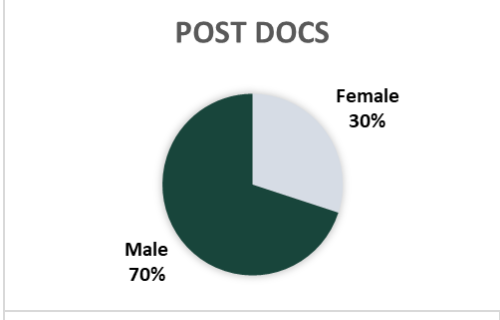
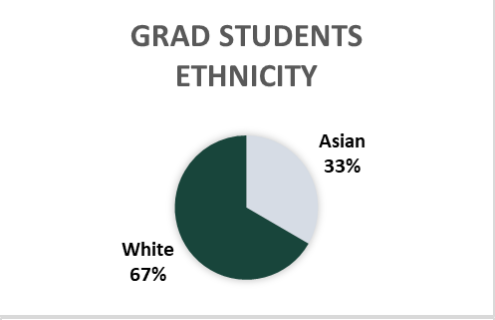
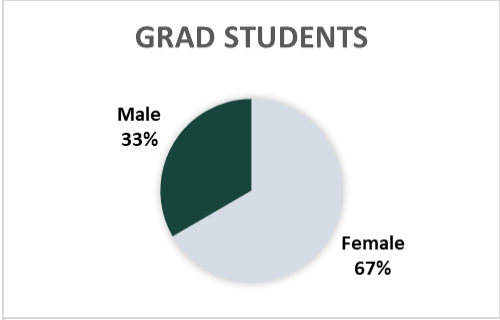
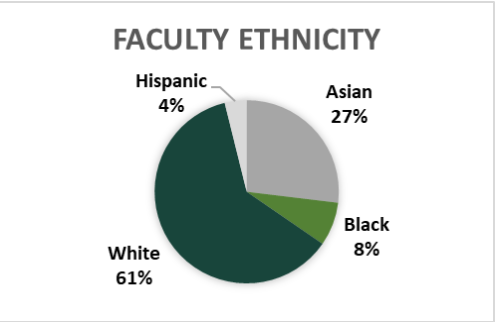
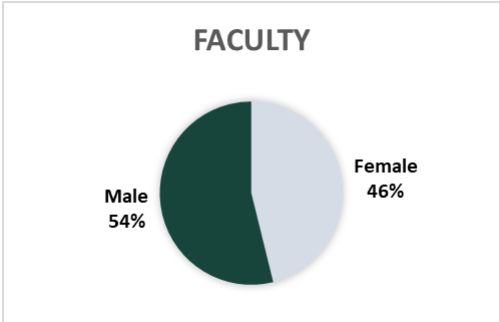
Gregory Burns, PhD	MSU	March 4, 2020	Departmental RIP Presentation	"Identification of FOXC1 as a Transcriptional Regulator in Induced Endometriosis Lesions"
Ronald Chandler, PhD	MSU	March 11, 2020	Departmental RIP Presentation	"Chromatin Regulation of the Endometrium"
Keith Latham, PhD and Peter Schall	MSU	June 1, 2020	RDSP	"Regulating gene expression at the start of life"
Jason Knott, PhD	MSU	June 8, 2020	RDSP	"Molecular insights into regulation of early lineage formation and pluripotency in preimplantation embryos"
Amy Ralston, PhD and James K. Billman, Jr., MD	MSU	June 22, 2020	RDSP	"Efficient and high sensitivity visualization of endogenous proteins in mouse embryos"
Ronald Chandler, PhD	MSU	July 20, 2020	RDSP	"Chromatin regulation of the endometrium"
Asgerally Fazleabas, PhD	MSU	August 3, 2020	RDSP	"Historical perspectives on recognition of pregnancy"
Jose Teixeira, PhD	MSU	August 17, 2020	RDSP	"Mullerian duct biology"
Peggy Petroff, PhD	MSU	August 31, 2020	RDSP	"Immunology of Pregnancy: Foundations and History"
Ripla Arora, PhD	MSU	September 9, 2020	Departmental RIP Presentation	"Deconstructing Mechanisms of the Uterine Gland Branching Morphogenesis"

Jens Schmidt, PhD	MSU	September 23, 2020	Departmental RIP Presentation	"Nucleolar Phase Separation is a Barrier for Telomerase Assembly"
Kristen Upson, PhD	MSU	September 30, 2020	Visiting Professor Program	"Impact of factors both common and unique to reproductive- age women on toxic metal body burden"
Jake Reske	MSU	October 7, 2020	Departmental RIP Presentation	"Chromatin mechanisms underlying SWI/SNF transcriptional regulation in the endometrium"
Jessica Shepherd, MD	Baylor Scott & White Health	October 14, 2020	Michigan State University and Spectrum Health Medical Group Professor Program	"Orlahnn; An Oral Treatment for Heavy Bleeding Due to Fibroids in Premenopausal Women"
Genna Moldovan	MSU	October 28, 2020	Departmental RIP Presentation	"Role of the HIPPO and NOTCH signaling pathways in endometrial stromal cells during decidualization"
Sascha Drewlo, PhD	MSU	November 4, 2020	Departmental RIP Presentation	Early identification of high-risk pregnancies using single-cell mass cytometry
Emma Guiliani, MD	The Fertility Center	November 11, 2020	Michigan State University and Spectrum Health Medical Group Professor Program	"Obesity and Reproduction: what is the role of the endometrium?"
Cara Poland, MD	MSU	December 2, 2020	Departmental RIP Presentation	"Addiction Medicine:

				Treating and Training”
Mike Wilson	MSU	December 9, 2020	Departmental RIP Presentation	“Understanding the shared roles of obesity and genetic mutation in the development of endometrial cancer”

Previous years seminars can be found [here](#).

DEPARTMENT MEMBER DIVERSITY AND INCLUSION



Concluding Statement and future Goals for 2021.

The 2020 COVID19 Pandemic will be remembered as the single most significant disruptor to academic medicine in the last 50 years. All 3 of the department's missions of clinical care, education and research were significantly impacted. Despite this unimaginable situation Department members, through their dedication, ingenuity and resilience achieved greater success in each of our missions than 2019. The 2020 Annual Report chronicles this success and exceptional achievements of our departmental faculty and a testimonial to the support of staff, student's and post-doctoral fellow's.

Our goals for 2021 include:

- Complete the transition of the Oncofertility Consortium to MSU
- Advance our research collaboration with our Health Center and Community partners
- Pilot the CHM student Research Certificate Program.
- Expand current resident implicit bias training program and scholarly opportunities.
- Expand substance use disorder training to MSU medical, nursing and physician assistant students.
- Sustain current research grant and contract funding.