The Division of Basic Biomedical Sciences at the Sanford School of Medicine creates an environment of innovative and interdisciplinary research aimed at examining human disease.

As an undergraduate, graduate or medical student, students learn in both the classroom and in the research laboratory. This learning environment helps students understand the human organism and translate that knowledge into diagnostic and therapeutic development.

Students study under faculty who have a wide breadth of research and teaching interests. Through discovery, education and service, our faculty develop novel approaches for diagnosing, managing and treating disease.
FACULTY/STAFF

SCOTT DRUECKER, MS
Assistant Professor

JANE GAVIN, MS
Assistant Professor

BARB GOODMAN, PHD
Professor
SD BRIN Director

GERALD MCGRAW,
EDD, MPAS, MBA, PA
Assistant Professor

ANGELA SCHLADOER,
DPM
Assistant Professor

ACADEMIC SUPPORT STAFF

BILL HANSEN, Mortician

BOB HANSEN, Mortician

DANA HANSEN, Teaching Lab Assistant

SHANNON HIRSCH, Teaching Lab Coordinator

RESEARCH FACULTY

LEE BAUGH, PHD
Associate Professor
CBBRe/CGBH

BRIAN BURRELL, PHD
Professor
CBBRe/USD N3

MICHAEL CHAUSSEE,
PHD
Associate Professor

VICTOR HUBER, PHD
Associate Professor
SD BRIN

JOYCE KEIFER, PHD
Professor

CURT KOST, PHD
Associate Professor

YI-FAN LI, PHD
Associate Professor

PASQUALE MANZERRA,
PHD
Assistant Professor

DOUGLAS MARTIN,
PHD
Professor

LISA MCFADDEN, PHD
Assistant Professor
FACULTY/STAFF

ROBERT MORECRAFT, PHD
Professor

NIRMAL PARAJULI, PHD
Research Assistant Professor

SCOTT PATTISON, PHD
Assistant Professor

JOSE PIETRI, PHD
Assistant Professor

KHOSROW REZVANI, MD, PHD
Associate Professor

SAMUEL SATHYANESAN, PHD
Associate Professor

HONGMIN WANG, PHD
Associate Professor

XUEJUN “XJ” WANG, MD, PHD
MD/PhD Program Dir. Professor

KEITH WEAVER, PHD
Professor

HONG ZHENG, MD
Assistant Professor

BBS GRADUATES

TAYLOR BOSCH, PHD 2018 Summer
Research Associate, Dr. Baugh Lab, BBS

BRENNA BRAY, PHD 2018 Fall
Director of Operations Scribe Connect

SHAYDEL DAVIES, MS 2018 Summer

LAURA FOX, PHD/MD 2019 Spring

RYAN GERAETS, PHD/MD 2019 Spring
Family Medicine, Sioux Falls, SD

HANMING ZHANG, PHD 2019 Spring
Postdoctoral Fellow, Yale School of Medicine

MATT WEBER, PHD 2018 Summer
Postdoctoral Fellow, University of Iowa

RETIREDE FACULTY

ZHAOQING ZHENG, MD, PHD
Assistant Professor

KATHLEEN EYSER, PHD
Associate Professor

ROBINS MISKIMINS, PHD
Professor

WILLIAM PERCY, PHD
Associate Professor

GERALD YUTRZENKA, PHD
Associate Professor

Associate Dean
Diversity & Inclusion

BBS GRADUATES
RESEARCH/CORE SUPPORT STAFF

SRIVISHNUPRIYA ANBALAGAN
Research Associate II

JAIME BUSHMAN-SCHOLL
Research Associate III

EDUARDO CALLEGARI
Proteomics Core Facility Director

LUCI DRAPEAU
BRIN Tribal College Coordinator

DONIS DRAPPEAU
Diversity & Pipeline Coordinator

JESSICA FREELING
Physiology Research Core Director

JIZHI GE
Research Associate III

LIZ HAJOVSKY
Research Associate II

ANDREA HERRERA
Postdoctoral Research Fellow

AUDREY JOB
Lawrence Brothers Camp Director

EMILY KABEISEMAN
Research Associate III

KIRSTEN KIM
Research Associate II

ZACHARY KING
Research Associate III

DAMON LEADERCHARGE
Assistant Program Coordinator NAHSP

MEGAN LEWNO
Research Associate II

XUEFEI LIU
Research Associate III

YANYING LIU
Postdoctoral Research Fellow

KEITH MAST
Research Associate II

JOSH MCWHIRT
Research Associate I

DANIELA PAEZ
Research Associate II

BO PAN
Postdoctoral Research Fellow

RAUSHAN POTTs
Research Associate III

SANAM SANE
Postdoctoral Research Fellow

MONICA SATHYANESAN
Research Associate III

MARIE SEVERSON
Research Associate I

REKHA SRINIVASAN
Research Associate II

JACK STERNBURG
Research Associate I

KALPANA SUBEDI
Research Associate II

ROSE ZEDIKER
BRIN Program Assistant I

EMILY KABEISEMAN
Research Associate III

KIRSTEN KIM
Research Associate II

ZACHARY KING
Research Associate III

DAMON LEADERCHARGE
Assistant Program Coordinator NAHSP

MEGAN LEWNO
Research Associate II

XUEFEI LIU
Research Associate III

YANYING LIU
Postdoctoral Research Fellow

KEITH MAST
Research Associate II

JOSH MCWHIRT
Research Associate I

DANIELA PAEZ
Research Associate II

BO PAN
Postdoctoral Research Fellow

RAUSHAN POTTs
Research Associate III

SANAM SANE
Postdoctoral Research Fellow

MONICA SATHYANESAN
Research Associate III

MARIE SEVERSON
Research Associate I

REKHA SRINIVASAN
Research Associate II

JACK STERNBURG
Research Associate I

KALPANA SUBEDI
Research Associate II

ROSE ZEDIKER
BRIN Program Assistant I

EXTERNAL RESEARCH FACULTY

GARETH DAVIES
Professor of Psychology

ERIK EHlI
Associate Professor of Psychology

KRISTI EGLAND
Associate Professor of OB/GYN

KEITH MISKIMINS
Professor of OB/GYN

JIANNING TAO
Assistant Professor of Surgery

EMILY GRIESE
Assistant Professor of Pediatrics

MICHELLE BAACK
Associate Professor of Pediatrics

JOHN BRANNIAN
Professor of OB/GYN

KEITH HANSEN
Chair OB/GYN

INDRA CHANDRASEKAR
Assistant Professors of Pediatrics

PILAR DE LA PUENTE
Assistant Professor of Surgery

RANDY FAUSTINO
Assistant Professor of Pediatrics

KEVIN FRANCIS
Assistant Professor of Pediatrics

KURT GRIFFIN
Associate Professor of Pediatrics

MICHAEL KARETA
Assistant Professor of Pediatrics

LANCE LEE
Associate Professor of Pediatrics

SAM MILANOVICH
Assistant Professor of Pediatrics

DAVID PEARCE
Professor of Pediatrics

STEVEN POWELL
Associate Professor of Internal Medicine

KYLE ROUX
Associate Professor of Pediatrics

ALEXEI SAVINOV
Associate Professor of Pediatrics

KAMESH SURENDRAN
Associate Professor of Pediatrics

PAOLA VERMEER
Assistant Professor of Surgery

PETER VITIELLO
Associate Professor of Pediatrics
UNDERGRADUATE & GRADUATE EDUCATION

UNDERGRADUATE SERVICE TEACHING

Enrollments. This year saw a small increase in student numbers associated with our undergraduate service courses. Our Vermillion-based courses continue to have solid enrollments. Courses such as BIQC 430 (Biochemistry), ANAT 411 (Human Gross Anatomy) and PHGY 420 (Human Physiology) are part of the Medical Biology curricular options and continue to show growth. PHGY 220/230 (Human Anatomy and Physiology I/II), service courses for Nursing and Dental Hygiene, have shown smaller increases.

Enrollment in our Continuing and Distance Education (CDE) course have generally stabilized. However, highly variable enrollments in our face-to-face courses offered at USD Community College for Sioux Falls and Rapid City continue. These courses include Anatomy and Physiology and Basic Microbiology. Working with Nursing, we have agreed to offer our anatomy and physiology courses at each campus during the fall and spring semesters and our basic microbiology course each spring semester. The highly variable enrollments at USD Community College for Sioux Falls and Rapid City/DDN make scheduling a challenge. Enrollments at the Rapid City/DDN site has been so low that sections have been canceled to avoid significant financial losses. These students were offered positions in our online courses.

This summer one of our Master’s Plan B (Non-thesis) students finished a project comparing the undergraduate anatomy and physiology content of our four instructors in three delivery methods (face-to-face, online, and hybrid). This project confirmed the expectations that students taking any BBS Anatomy and Physiology section are receiving similar learning content. The differences in learning objectives among the four instructors were relatively minor.

GRADUATE (MSc, PhD & MD/PhD) TRAINING

The MSc and PhD program. The Division's Graduate Committee has had a busy year. Among its major accomplishments if a reassessment of our core curriculum for PhD students and development of a more comprehensive graduate student handbook. The Graduate Committee visited with the divisions faculty and students to assess the content and value of the core courses Foundations 1 and Foundations 2. Changes have been recommended for both courses and are being implemented.

In the third year of existence, the MSc Plan B program continues to show solid student enrollments and success. The MSc Plan B program attracts students interested in seeking admission to professional training programs and for who additional training may improve their opportunities. Among the courses typically taken by our MSc Plan B students are Human Physiology, Human Gross Anatomy, Pre-Professional Pharmacology, Immunology, Research, Neurobiology, Teaching in the Basic Sciences, and Responsible Conduct of Biomedical Research.

MSc PLAN B SUMMARY

43 Admitted to date
14 Graduated
18 Still in Program
4 Withdrawed for academic reasons
7 withdrew for alternate programs (admitted to professional/PhD programs)
22 Have applied to a professional program
17 have been accepted (77% success)

MD/PhD Student Progress. The MD/PhD program continues to work on areas of concern in cooperation with Medical Student Affairs and leaders from Pillar 1 and 2. This year the MD/PhD Coordination Committee revised the student handbook, established firm deadlines for the transition from the research phase to Pillar 2, and established a process to provide the MD/PhD students during their research phase with ongoing and meaningful clinical experiences.
PRECLINICAL CURRICULUM PROGRESS

The basic structure of Pillar 1 begins with two introductory courses (Medical Foundations 1 and 2) in which the “Foundational Material” for the content appearing later in the curriculum is presented. These are followed by eight courses centered on the following systems: Skin/Musculoskeletal, Nervous Systems, GI & Hepatobiliary, Blood/Hematopoietic/Lymphoreticular, Cardiovascular, Renal/Urinary, Respiratory and Endocrine/Reproductive. There are three Foundations of Clinical Medicine courses that complement and supplement the knowledge objectives of Pillar 1. The system courses are designed to facilitate a "student-centered learning" paradigm and consist of an average of 16 or fewer hours per week of traditional lecture (with no more than 32 total hours per week of scheduled activities), coupled with objective-driven clinical cases that are used in active learning PBL/TBL sessions.

Both basic science and clinical faculty contribute to content delivery and assessment throughout Pillar 1. All Pillar 1 examinations are being administered using online testing so that grades and class performance can be reviewed immediately. Pillar 1 utilizes ExamSoft, a system that provides comprehensive data analysis for both faculty and students. These methods of assessment enable us to meet, in part, LCME’s Standard 9.8 [A medical school has in place a system of fair and timely summative assessment of medical student achievement in each course and clerkship of the medical education program. Final grades are available within six weeks of the end of a course or clerkship].

REVIEW OF AY 2017-18
AY 2017-18 saw the Class of 2021 complete the fifth run of Pillar 1. This class’s average score on the NBME Comprehensive Basic Science Exam in December 2018 (68.3) was higher than the previous four years (2017 – 68.1, 2016 - 65.3, 2015 - 66.3, 2014 - 63.4) and, on this occasion, was above the national average of 62.9. All students in the Class of 2021 have now taken STEP-1 and 64/66 students passed on the first attempt, with two successfully passing on the second attempt. The SSOM average score was 235 which meets or exceeds our recent scores from both before and after the introduction of the new preclinical curriculum: 227 (2011), 225 (2012), 229 (2013), 221 (2014), 225 (2015), 232 (2016), 229 (2017), 235 (2018).

REVIEW OF AY 2018-19
AY 2018-19 represents the sixth run of the Pillar 1 pre-clinical organ/system-based curriculum, this time for the class of 2022. To date, this class has completed Medical Foundations 1 and 2, Clinical Foundations 1, Skin/Musculoskeletal, Nervous System, Blood/Hematopoietic/Lymphoreticular, Cardiovascular, and Renal-Urinary. Both the assessment data and student input from each of these courses have been reviewed by the teaching faculty and, as Pillar 1 progressed, student-driven revisions to the schedule, content delivery and assessment methods were made, based on feedback received from focus groups and student surveys.

It is important to note that Medical Foundations 2 and Nervous Systems encountered challenges during the early runs of the Pillar 1 curriculum. Both have improved significantly over the past few offerings in grade distribution and student satisfaction. The strong leadership of their course directors and invaluable feedback from countless student focus groups and the addition to one additional contact week to each course has allowed the courses to evolve into highly performing and stable courses.

The grade distribution for the Courses completed by the Class of 2022 and the corresponding data for the Classes of 2021, 2020, 2019, 2018 and 2017 are shown below:

<table>
<thead>
<tr>
<th>COURSE NAME</th>
<th>GRADE = A</th>
<th>GRADE = B</th>
<th>GRADE = C</th>
<th>GRADE = D</th>
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<tbody>
<tr>
<td>Medical Foundations 1</td>
<td>47</td>
<td>20</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Medical Foundations 2</td>
<td>26</td>
<td>40</td>
<td>3*</td>
<td>0</td>
</tr>
<tr>
<td>Skin/Musculoskeletal</td>
<td>37</td>
<td>28</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Nervous Systems</td>
<td>31</td>
<td>31</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Blood/Hematopoietic/Lymphoreticular</td>
<td>44</td>
<td>21</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>GI-Hepatobiliary</td>
<td>20</td>
<td>42</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>40</td>
<td>25</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Renal-Urinary</td>
<td>44</td>
<td>21</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory</td>
<td>44</td>
<td>22</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Endocrine-Reproductive</td>
<td>36</td>
<td>27</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>


Several important educational initiatives have been incorporated into Pillar 1 since its first iteration - these include:

(i) All courses include a customized NBME exam at their conclusion and it is important to note that overall class performance on these exams has typically exceeded the NBME’s own rating of the difficulty level of the assessments.
(ii) Students take the Comprehensive Basic Science Exam three times; December of year 1, May of year 1, and November/December of year 2. The purpose of this is to give the students experience in taking standardized multidisciplinary NBME exams and to then provide them with a quantitative measure of their retention of earlier course material. This allows them to map their progress as they move through the preclinical curriculum.

(iii) In order to address LCME Standard 9.6 [A medical school ensures that a narrative description of a medical student's performance, including his or her non-cognitive achievement, is included as a component of the assessment in each required course and clerkship of the medical education program whenever teacher-student interaction permits this form of assessment.] a number of PBL exercises (1 per course) have been incorporated into the curriculum. Each small group has its own faculty facilitator who interacts with the students and generates a narrative report regarding their contribution to the activity; this score is then incorporated into their final course grade. We continue to thank Dr. Beard for his extensive contribution to the development of these exercises.

Four courses are experiencing leadership transition. Medical Foundations 1 is being directed by Dr. Angela Schlauder, Gastrointestinal and Hepatobiliary Systems by Dr. Khosrow Rezvani, and Endocrine – Reproductive systems by Dr. Edward Bagu. Dr. Steven Waller is serving as codirector of these courses during this transition period. Dr Bruce Cuevas is directing the Blood/Hematopoietic/Lymphoreticular Systems course with Dr. Micheal Kock as his co-director.

The BBS Course Directors’ group meets weekly and continues with the task of curriculum oversight for Pillar 1 to ensure any developing issues are addressed effectively and in a timely manner. All courses are revised on an ongoing basis, using both student and faculty input to drive the process.

FUTURE PROBLEMS & HOW TO DEAL WITH THEM....

The Pillar 1 teaching faculty continue to identify areas critical to the continued success of the preclinical curriculum. Chief among these are:

(i) The role of lecture capture with Panopto in our educational strategy. Currently, Panopto recordings are released with a 24-hour delay. Students continue to seek earlier release of the recordings. The course directors do not favor changing the 24-hour delay during the middle of the academic year. The decision regarding if and for how long to delay release of the Panopto recordings may be best considered annually and prior to the start of the new academic year.

(ii) The development of new methods for evaluating both teaching faculty and the individual courses themselves. The relationship between “teachers” and “learners” has been changed because of preclinical curriculum reform and faculty no longer simply stand in front of the class and present information in a predominantly lecture-based format. As a result, their roles as educators have become multi-faceted and the success of this is being assessed by evolving evaluation instruments that reflect this paradigm shift. This is important because BBS teaching accomplishments are currently assessed, in part, via the student evaluation process; this in turn has implications for issues of faculty salaries and promotion and tenure prospects. Similarly, the increased use of self-directed learning, small group activities and PBL/CBL/TBL as teaching methods will require that students evaluate the success of each course in achieving its educational goals by a broader assessment process than has traditionally been used. The BBS Course Directors’ group has actively engaged in this process with the development of a more rigorous internal course evaluation process. The results of this are then shared between Courses to allow successful strategies to be adopted, while preventing later Courses from repeating “mistakes”.

CHALLENGES FOR THE PILLAR 1 CURRICULUM LOOKING TO THE FUTURE:

The Pillar 1 teaching faculty believe that the following items need to be addressed to ensure the continuing success of the preclinical curriculum:

(i) We will need continued clinical faculty input and participation in the teaching and testing process. BBS faculty continue to acknowledge the indispensable contributions that our clinical colleagues have made to the development and evolution of Pillar 1. However, to maintain the momentum that has developed since the introduction of the current curriculum we will need sustained, ongoing clinical faculty participation in the content delivery and assessment process.

(ii) The PBL exercises included in most of our courses would be greatly enhanced by a ready pool of clinical faculty willing to participate in the development and delivery of PBLs.

(iii) In order to develop consistency in case handling and in the generation of narrative reports for students, it would be helpful if the same facilitators were involved on each occasion. A robust facilitator training program is needed to ensure a comparable experience from student to student and facilitator to facilitator. Training will also ensure quality narrative feedback given to students.

(iv) The intense focus on Step 1 by students continues to appear earlier and earlier in Pillar 1. Students appear to diminish the importance of content provided that is not directly relevant to Step 1. Efforts to remind students that Step 1 is only part of the Pillar 1 continue but need to be reinforced at all opportunities.
BBS GRADUATE PROGRAM

Funding for BBS Graduate Students comes primarily from BBS, Avera, and Sanford Research. Nine BBS grants and fellowships were also used to fund 13 BBS students in 2018-2019. Students funded by the USD N3 grant receive an increased stipend of $34,000 annually for two years.

Two BBS Graduate Students are currently funded by their own fellowships.

**Anderson, Ruthellen (Elle)**, MD/PhD Student in Dr. Francis’ lab, Sanford Research.
Regulation of pluripotent stem cell differentiation by sterol metabolism, National Institutes of Health - NIH, $50,000.00 annually (2/20/2018-2/19/2023).

**Paulsen, Riley**, PhD Student in Dr. Burrell’s lab, BBS.
Conserved activity-dependent regulation of endocannabinoid signaling, Graduate Research Fellowship Program (GRFP), National Science Foundation, $46,000 annually (9/1/19-8/31/2024).

Additionally, Ms. Paulsen was selected to participate in the NIH’s Graduate Summer Opportunities to Advance Research (G-SOAR), a 10-week internship in translational research conducted at NIH laboratories during the 2019 summer session. Riley is one of only 18 graduate students from across the country to be selected to this program.

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### BBS Graduate Program

<table>
<thead>
<tr>
<th>Degree</th>
<th>Years</th>
<th>BBS Stipend</th>
<th>2016-2017</th>
<th>2017-2018</th>
<th>2018-2019</th>
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<td>PhD</td>
<td>4-5</td>
<td>$28,084</td>
<td>25</td>
<td>24</td>
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<tr>
<td>MD/PhD</td>
<td>7 (PhD)</td>
<td>$28,084</td>
<td>5</td>
<td>7</td>
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<td>MS - Thesis</td>
<td>2</td>
<td>$14,042</td>
<td>2</td>
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<td>MS - Non-Thesis*</td>
<td>1-2</td>
<td>0</td>
<td>10</td>
<td>13</td>
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*New degree in FY16, many move on to other medical programs after one year

---

### BBS Graduate Student Enrollment

<table>
<thead>
<tr>
<th># Students</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
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<tr>
<td># PhD</td>
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<td># MD/PhD</td>
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</tr>
<tr>
<td># MS Thesis</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># MS Non-thesis (new)</td>
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<td></td>
<td></td>
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<tr>
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<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
BBS STUDENT EMPLOYMENT AND OUTREACH

The BBS faculty members mentor many Medical Student Researchers throughout the year with funding from grants and SSOM Medical Student Research funds.

- Cancer Biology Research Center – grant year 8
- Developmental Research Program for Medical Students (DRPMS) – NIH T35 grant
- Medical Student Summer Research Program (MSSRP) – SSOM Med Student Research funding

BBS employs and supports over 100 undergraduate USD students each year in a variety of programs. Students work as mentors, camp counselors, administrative assistants, teaching lab assistants, and research lab assistants. Many complete research projects and present their research at conferences, IdeaFest, or as a thesis in the Honor’s Program. Funding for undergraduates comes from a variety of sources:

- Basic Biomedical Sciences / Laboratory Science Fees / PI Grants
- BioSNTR Undergraduate Summer Research Opportunity – SD EPSCoR
- Council for Undergraduate Research and Creative Scholarship (CURCS) – Gallagher Center for Experiential Learning & Education Abroad (GC) at USD
- Center for Brain and Behavior Research (CBBRe) – Center supported by BBS/SSOM/ORSP/USD
- Healthcare Careers Camp – SD Department of Health grant
- Inclusive Science Initiative (ISI) – Howard Hughes Medical Institute grant
- Lawrence Brother’s Science Camp Counselors
- Native American Healthcare Scholars Program (NAHSP) – HHS Diversity Pipeline grant
- SD BRIN Undergraduate Research Fellows Program (SD BRIN) – NIH grant
- Summer Program for Undergraduate Research in Addiction (SPURA) – NIH grant
- USD UD discover
- USD Workstudy
- Volunteers

BBS engages a multitude of High School and Middle School students in various programs, camps, and mentee opportunities across the state.

- Healthcare Careers Camp – SD Department of Health grant
- Lawrence Brother’s Science Camp
- Native American Healthcare Scholars Program (NAHSP) – HHS Diversity Pipeline grant
- SD BRIN Research Apprentice Program (SD BRIN) – NIH grant

Student Groups
- AISES American Indian Science & Engineering Society
- BGSO BBS Graduate Student Organization
- CGSO CBBRe Graduate Student Organization
- PreMed Society
BASIC BIOMEDICAL COURSE LIST

STUDENTS TAUGHT (2018-2019)

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
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<tbody>
<tr>
<td>IMC 501</td>
<td>142 Medical Students</td>
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<tr>
<td>IMC 502</td>
<td>14 MD/PhD Students</td>
</tr>
<tr>
<td>IMC 601</td>
<td>39 Graduate Students</td>
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<tr>
<td>IMC 602</td>
<td>32 Occupational Therapy</td>
</tr>
<tr>
<td>IMC 603</td>
<td>32 Physical Therapy</td>
</tr>
<tr>
<td>IMC 604</td>
<td>26 Physician Assistant</td>
</tr>
<tr>
<td>IMC 605</td>
<td>&gt;3000 Undergraduates</td>
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<tr>
<td>IMC 608</td>
<td>142 Medical Students</td>
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<tr>
<td>IMC 609</td>
<td>14 MD/PhD Students</td>
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<td>IMC 610</td>
<td>39 Graduate Students</td>
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<td>32 Occupational Therapy</td>
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<tr>
<td>IMC 614</td>
<td>&gt;3000 Undergraduates</td>
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<tr>
<td>MICR 722</td>
<td>732 Advanced Neuroanatomy</td>
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<td>310 Biological Chemistry</td>
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<td>430 Principles of Biochemistry</td>
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<td>MICR 728</td>
<td>530 Principles of Biochemistry</td>
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<tr>
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<tr>
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</tr>
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In FY19,
• BBS promised $841,000 in one-time or short-term support to our research and scholarly missions to ensure all faculty in the Division had access to development opportunities, travel, research necessities, and funds for publication fees, as this assistance encourages continued grant proposal submissions that lead to future grant funding.
• BBS received 30 external funding awards in the amount of $12 million, which represents 74 percent of the Sanford School of Medicine’s grant income and almost 33 percent of USD’s grant income.
• BBS faculty, graduate students, and medical students contributed to and published:
  o 3 Book Chapters
  o 52 Articles/Editorials
• BBS hosted 17 external speakers and 6 internal speakers to participate in the BBS Faculty Seminar Series. The Inclusive Science Initiative (funded by a Howard Hughes grant) and BBS co-sponsored another 6 external speakers who were invited to speak at the Health & Diversity Dialogues. Both series are open to all USD departments and the public.
• 23 BBS Graduate Students gave talks on their research projects as part of the BBS Graduate Seminar Series which correlates with the BBS CPHD790/890 graduate course.
• USD-N3 hosted an Entrepreneurship Workshop, an Internship Workshop, and a STEM Professional Development Workshop, all funded by the NSF grant supporting the USD Neuroscience, Nanotechnology and Networks (USD-N3) program.
• The Center for Brain & Behavioral Research (CBBRe) hosted a Community Forum on Bullying and the Annual CBBRe Symposium.
• CBBRe awarded multiple training, pilot, and travel awards to faculty, staff, and students (see CBBRe section below.
• The Summer Program for Undergraduate Research in Addiction (SPURA) selected six students to participate in a 12-week multi-disciplinary summer research program. Each student received a $4,800 stipend and the faculty mentors received $1,000 to support the student’s research project or the student’s travel to a meeting to present their work. This summer program is funded by a National Institute on Drug Abuse (NIDA) R25 research grant.
  o Rachel Rucker, a SPURA 2018 Alum, was awarded the Barry Goldwater Scholarship & Excellence in Education award.
• The SD Biomedical Research Infrastructure Network (SD BRIN) held the 2019 Undergraduate Research Symposium which brings together undergraduate students involved in the NSF EPSCoR RII Track-1 project, the South Dakota Biomedical Research Infrastructure Network (SD BRIN) and the other Research Experiences for Undergraduates programs in South Dakota.
• SD BRIN’s Undergraduate Research Fellows (UGF) Program selected multiple student researchers from across the state to participate in this opportunity to learn and grow as a scholar under the guidance of a research mentor from a participating SD institution. Salary support is paid by the home institution to the fellows as is the $2000 to the laboratory of the mentor to purchase supplies.
• SD BRIN again offered two programs that encourage youth to experience and learn science. These programs are for middle and high school students.
  o Lawrence Brothers Science Camp (middle school students) – A broad theme is chosen for the week-long residential camp that includes physical science, chemistry, life science, mathematics and health sciences.
  o Research Apprentice Program (RAP) introduces 5-8 disadvantaged high school students to research by having them work with USD researchers for five weeks during the summer.
• SD BRIN continued its support of the USD Libraries with a contribution of $276,006. This is Year 18 of funding.
COLLABORATIONS

DAKOTA CANCER COLLABORATIVE ON TRANSLATIONAL ACTIVITY (DaCCoTA)
https://med.und.edu/daccota/
The DaCCoTA is supported by the National Institute of General Medical Sciences of the National Institutes of Health under Award Number U54GM128729.
- The goal of DaCCoTA is to bring together researchers and clinicians with diverse experience from across the region to develop unique and innovative means of combating cancer in North and South Dakota.
- We believe advances in cancer treatment will come from broad approaches by collective groups of clinical and basic researchers who are focused on conducting clinical/translational research.

GREAT PLAINS IDeA-CLINICAL & TRANSLATIONAL RESEARCH (GP IDeA-CTR)
https://gpctr.unmc.edu/
Great Plains IDeA-CTR is a collaborative effort between nine regional institutions to build an effective system and infrastructure to transform and advance clinical and translational research (CTR) across Nebraska, Kansas, North Dakota, and South Dakota. The IDeA-CTR strives to provide training, education and mentorship; tools and resources; and funding to regional researchers.
- Funding from the National Institutes of Health (NIH) and a commitment to the motto that “together we are better”, the GP IDeA-CTR Network was formed to uphold the NIH’s nationwide effort to improve the health of all Americans, and to provide approaches to overcoming the issues endemic to our part of the country.

CENTER FOR GENETICS AND BEHAVIORAL HEALTH
https://www.usd.edu/cbbre/center-for-genetics-and-behavioral-health
The Center for Genetics and Behavioral Health is funded by a five-year, $3.4 million grant from the State of South Dakota Governor’s Office for Economic Development.
- The Center for Genetics and Behavioral Health studies the genetic and environmental influences that interact with other biological, psychological and behavioral factors to impact post-traumatic stress disorder (PTSD).
- The center is a partnership between the Center for Brain and Behavior Research and the Avera Institute for Human Genetics.
- The Center for Brain and Behavior Research faculty bring their expertise in stress, trauma and addiction from the molecular to the behavioral level, and uses resources in place at USD for psychological assessment, behavioral testing, bioinformatics and functional brain imaging. The Avera Institute for Human Genetics brings expertise and research on clinically relevant genetic variants and how these relate to psychological and health outcomes.

CENTERS

CENTER FOR BRAIN AND BEHAVIORAL RESEARCH (CBBRe)
Formed in 2014 and recognized as a USD Center
Lee Baugh Ph.D., Director and Brian Burrell Ph.D., Associate Director
https://www.usd.edu/cbbre
CBBRe promotes innovative basic to translational research that addresses problems in neurology, neuropsychology and psychiatry. Funding for CBBRe has historically come primarily from SSOM and BBS to support an administrative assistant, pilot funds for research, student travel awards for professional meetings and/or training opportunities, the annual Center for Brain & Behavior Research Symposium, outreach activities, and student recruitment efforts.
However, external state and federal funding has been acquired to help CBBRe grow and support their staff and additional programs and research opportunities for students, faculty, and staff.

CENTER FOR GENETICS AND BEHAVIORAL HEALTH
Lee Baugh Ph.D., Director
Awarded Governor’s Office for Economic Development: Center for Genetics and Behavioral Health Grant
- A five-year grant for $3.4 million beginning in July, 2017
- A collaboration between CBBRe and the Avera Institute for Human Genetics.
- Studies the genetic and environmental influences that interact with other biological, psychological and behavioral factors to impact post-traumatic stress disorder (PTSD)
Riley Paulsen, BBS PhD candidate in the USD-N3 Graduate Program, training in the development of novel nanotechnology-derived tools aimed at both understanding the brain and potentially treating disorders of the brain.

SCHOLARSHIP

CENTER FOR BRAIN AND BEHAVIOR RESEARCH CBBRe
Summer Program for Undergraduate Research in Addiction (SPURA)
Co-Directors, Brian Burrell Ph.D. (BBS) and Lisa McFadden Ph.D. (BBS)
Awarded SPURA - Summer Program for Undergraduate Research in Addiction, U.S. Department of Health & Human Services, National Institutes of Health – NIH.
- This National Institute on Drug Abuse (NIDA) funding supports undergraduate research training (R25), awarded at $86,000 annually for 5 years during round 1 (2014-19); round 2 awarded at $93,000 annually for 5 years (4/15/19 – 2/29/24).
- This multi-disciplinary summer research program gives USD undergraduate students an opportunity to conduct high-quality, mentored, hypothesis-driven research in fields related to substance use, abuse and related or underlying mental health issues.

NEUROSCIENCE, NANOTECHNOLOGY AND NETWORKS PROGRAM (USD-N3)
Co-Directors, Dr. Brian Burrell (BBS) and Ranjit Koodali (Grad School Dean)
Awarded NRT: USD Neuroscience and Nanotechnology Network, National Science Foundation, $2,943,561.00 (9/15/2016-8/31/2021)
- The USD Neuroscience, Nanotechnology & Networks Program (USD-N3) offers a new, team-based training approach to prepare graduate students for diverse career paths in STEM professions. The program emphasizes microtracks - a series of non-science courses that will prepare you for careers in:
  o Biotechnology
  o Scientific writing and editing
  o Government and public policy
  o Education
- Key Program Features
  o Participate in research aimed at developing nanotechnology-based tools to better understand the function of and develop treatments for the brain
  o Receive tuition and stipend support, including an annual stipend of $34,000 for two years during training
  o Discover opportunities for local and national internships
  o Connect with mentors in neuroscience and chemistry
  o Develop professional skills, including career planning and public speaking
  o Receive support for student research projects and travel to professional meetings
  o Supplement science coursework through courses from the Beacom School of Business. These courses can be applied to a future Master of Business Administration at USD
- Students may apply through:
  o The Department of Chemistry
  o The Division of Basic Biomedical Sciences
  o The Department of Biomedical Engineering
  o The Department of Biology

As a result of the USD-N3 training grant, CBBRe students attend the annual NRT meeting (usually accompanied by the N3 Co-Director, Dr. Ranjit Koodali) where they have had an opportunity to present their research and discuss graduate student training experiences with students and faculty from other NRT-funded institutions as well as NSF staff.
SCHOLARSHIP

SUPPORT OF THE HUMAN FUNCTIONAL IMAGING CORE
Lee Baugh Ph.D., Director
Awarded
- MRI: Acquisition of Transcranial Magnetic Stimulation Instrumentation to Advance Understanding of the Brain, National Science Foundation, $103,871.00 (9/1/2017-8/31/2018)
- Great Plains IDeA-CTR, National Institutes of Health - NIH, University of Nebraska Medical Center, $112,000.00 (5/1/2018-6/30/2018)
  - In 2018 the Great Plains IDeA CTR-COBRE at UNMC provided $100,000 to purchase a Transcranial Electric Stimulation Device and High Definition Electroencephalography.

SD BIOMEDICAL RESEARCH INFRASTRUCTURE NETWORK (BRIN)
Barb Goodman Ph.D., Director
http://brin.usd.edu/home
- IDeA Networks of Biomedical Research Excellence (INBRE): statewide institutional networks that work together to leverage existing research resources and increase the quality of scientific rigor among faculty at research and undergraduate institutions to better prepare students for careers in biomedical science.
- SD BRIN has been funded by the National Center for Research Resources (NIH) since 2001. BRIN provides resources to researchers throughout South Dakota by supporting core facilities in proteomics, genomics, DNA sequencing and genotyping, and bioinformatics. Several of its core facilities are housed at USD. BRIN also allows students to participate in research, particularly through the Undergraduate Research Fellows Program.
- SD BRIN continues to provide funding for the USD library for the 18th year straight. Starting in 2002 BRIN provided $82,000, and this amount has increased 3-10% annually to the FY19 contribution of $276,006. The funding supports the following resources.

BRIN STUDENT RESEARCH PROGRAMS

UNDERGRADUATE RESEARCH FELLOWS (UGF)
This program provides each research fellow with an opportunity to spend 10 weeks working and learning in the hands-on environment of research labs at a SD BRIN partner institution. SD BRIN research fellows are paid $4,000 for the 10 week period. This program is designed to challenge researchers and to give them an in-depth understanding of biomedical research.
SD BRIN Research Opportunity Sites
- Augustana College
- Avera Research Institute
- Black Hills State University
- Dakota Wesleyan University
- Mount Marty College
- Sanford Research/USD
- South Dakota State University
- University of Sioux Falls
- University of South Dakota

LAWRENCE BROTHERS SCIENCE CAMP
Founded in 2002 by the descendants of USD alumni brothers Ernest O. and John Lawrence. E.O. won the Nobel Prize in Physics in 1939 for his invention of the cyclotron and John is known as the Father of Nuclear Medicine. A broad theme is chosen for the week-long residential camp that includes physical science, chemistry, life science, mathematics and health sciences. The goal of the camp is to inspire middle school students in science and give them hands-on opportunities to conduct experiments designed to challenge them and show them that science is fun.

RESEARCH APPRENTICE PROGRAM
The Research Apprentice Program or RAP was started at USD in 1989 by a grant supplement from the National Institutes of Health to Dean Robert Talley. The program introduces 5-8 disadvantaged high school students to research by having them work with USD researchers for five weeks during the summer. Research options include survey work in psychology and social work and work in a chemistry, biomedical science, or biology laboratory and are arranged by the program. RAP fellows also participate in the career and social opportunities of the simultaneous Upward Bound program which supports their room and board and activity expenses. The program has been offered at USD every summer since 1989.
BRIN CORE FACILITIES

PROTEOMICS
Eduardo Callegari, Ph.D., Director, USD
The SD BRIN Proteomics Core Facility provides state-of-the-art proteomics services to researchers from South Dakota and the region. Since 2002, the USD PCF has been providing proteomic analyses, as well as collaborating in the training of the use of common equipment such as the scanner, spot cutter, imaging software, technique and protocol issues, and sample preparation. Our goal is to provide all South Dakota researchers with the capability to rapidly analyze and identify protein expression patterns in their experimental systems.

BIOINFORMATICS
Department of Computer Science, USD
The USD Computer Science Department is committed to developing production quality software while giving students a valuable research experience. The department offers students opportunities for involvement in bioinformatics research at both the undergraduate and graduate levels. Students are involved in developing the infrastructure necessary to carry on bioinformatics research by creating software solutions that fit the needs of researchers.

WESTCORE
Shane Sarver Ph.D., Director and Cynthia Anderson Ph.D., Associate Director
The Western South Dakota DNA Core Facility (WestCore) was established at Black Hills State University as part of the South Dakota Biomedical Research Infrastructure Network (SD BRIN) in 2004. We provide critical infrastructure that enhances research, education and training in the biomedical sciences. WestCore supports research activities across the SD-BRIN network by providing services to our South Dakota academic institutions, as well as to investigators at public and private agencies & institutions nationwide. WestCore is currently supported in part by NIH IDeA Program Grant 2 P20 GM103443 from the INBRE Program of the National Institute for General Medical Sciences.

UNIVERSITY OF SOUTH DAKOTA LIBRARIES
Any faculty member or student from participating SD BRIN institutions may access anything physically located at USD Libraries or the SD BRIN-sponsored science databases at any time. SD BRIN supports current databases and their availability to faculty and students at participating PUIs: Augustana College, Black Hills State University, Dakota Wesleyan University, Mt. Marty College, Oglala Lakota College, Sinte Gleske University, Sisseton Wahpeton College, University of Sioux Falls and USD Basic Biomedical Sciences. University Libraries will support research and collaboration by providing SD BRIN librarians with reference support, training and assistance in accessing databases.

BBS CORE FACILITIES
https://www.usd.edu/medicine/basic-biomedical-sciences

Neuroimaging Core (CBBRe)
Proteomics Core (BRIN)

BEHAVIORAL CORE
Jamie Scholl, Core Manager
Behavioral assessment in animal models is often a necessary component for answering research questions effectively. The Behavioral Core provides a range of paradigms to measure discrete and varied forms of behavior, which can then be related to underlying physiological processes. Our modular equipment and software allows either automated or experimenter-based recording to facilitate rapid acquisition of data.

IMAGING CORE
Scott Pattison, Ph.D., Assistant Professor
With a range of digital imaging microscopy systems, the Imaging Core offers various optical microscopes for slide and cellular biological imaging. All USD and USD-affiliated researchers may use the facility at no charge. External rates may apply for outside entities. Data and image storage is the responsibility of the researcher.

PHYSIOLOGY CORE
Jessica Freeling, M.S., VT, LATG, Core Director
The physiology core facility provides basic and biological researchers with a central resource for creating models of animal physiology and pathophysiology. While our main focus is exploring the effects of cardiovascular disease and cancer in rodents, we can provide support to any aspect of animal research. We offer both invasive and non-invasive techniques for collecting in vivo physiological data.
**Faculty Rank**

<table>
<thead>
<tr>
<th>Faculty Rank</th>
<th>Tenure</th>
<th>Tenure - Retired</th>
<th>Tenure Track</th>
<th>Term</th>
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<tr>
<td>Associate Professor</td>
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<tr>
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<td>Instructor</td>
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<td>Research Assistant Professor</td>
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- # Female: 2 2 2 2 1 1
- # Male: 8 6 2 1 1 7 1 1

**Faculty Research Areas**

- Anatomy / Structural Biology: 7
- Biochemistry / Molecular Biology: 6
- Immunology / Microbiology: 6
- Neuroscience: 7
- Physiology / Pharmacology: 11
2018 FACULTY AWARDS & PROMOTIONS

STEVE BAMBAS, 2018 Excellence in Teaching Award, University Center
BRIAN BURRELL, 15 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
KATHLEEN EYSTER, 30 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
JANE GAVIN, 15 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
PASQUALE MANZERRA, 2018-2019 Basic Science Faculty Award, South Dakota Medical Student Association
ROBERT MORECRAFT, Class of 1958 Basic Science Faculty Award, USD Sanford School of Medicine Alumni Relations Council
STEVEN WALLER, 35 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
HONGMIN WANG, 10 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
KEITH WEAVER, 30 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
GERALD YUTRZENKA, Exemplary Service Award, Group on Student Affairs (GSA), Association of American Medical Colleges
GERALD YUTRZENKA, 35 Years of Service, Basic Biomedical Sciences, USD Sanford School of Medicine
BRIAN BURRELL, Promoted to Professor, Division of Basic Biomedical Sciences
LEE BAUGH, appointed the Donald S. McKay Distinguished Professor of Research, USD Sanford School of Medicine

BODY DONATION PROGRAM

There are a variety of students who benefit from the generous gift of whole body donation. These students include our future doctors, occupational therapists, physical therapists, physician’s assistants, nurses, pre-med students, a select grouping of undergraduate students and students enrolled at institutions participating in our Education Outreach Program. Currently our Educational Outreach Program institutions include Briar Cliff University, Lake Area Technical Institute, Northern State University, Northwestern College, Presentation College and South Dakota State University.

The Body Donation Memorial Service is held each September at the Lee Medicine & Science Building on the USD campus. Families of the previous year’s donors are invited to attend the service, light a candle for their loved one, and listen to music and reflections from select students. The service is followed by a reception. All the USD MD, PA, PT, and OT students are invited to attend and most do. In addition, we invite students and faculty from our partner institutions. Our next Memorial Service will be held September 20, 2019, at 3:30pm Lee Medicine & Science Atrium in Vermillion, SD.
COMMITTEE MEMBERSHIPS

1. ADMINISTRATIVE COUNCIL:
   - Scott Dreucker, MS, Vice Chair, Faculty Council
   - Pasquale Manzerra, PhD, Assistant Dean, Medical Student Affairs and Admissions
   - William Mayhan, PhD, Dean, Basic Biomedical Sciences
   - Steve Waller, PhD, Associate Dean, Basic Biomedical Sciences
   - Gerald Yutrzenka, PhD, Associate Dean for Diversity and Inclusion

2. ADMINISTRATIVE STAFF:
   - William Mayhan, PhD, Dean, Basic Biomedical Sciences
   - Gerald Yutrzenka, PhD, Associate Dean for Diversity and Inclusion

3. NATIVE AMERICAN ADVISORY COMMITTEE:
   - Gerald Yutrzenka, PhD

4. ADMISSIONS COMMITTEE:
   - Pasquale Manzerra, PhD, Assistant Dean, Medical Student Affairs and Admissions (Chair)
   - Denise Arrick, MS, Division of BBS
   - Khosrow Rezvani, MD, PhD, Division of BBS
   - Daniel Bird, PhD, Division of BBS
   - Kathleen Eyster, PhD, Division of BBS
   - Bruce Cuevas, PhD, Division of BBS
   - Michael Chaussee, PhD, Division of BBS

5. FACULTY COUNCIL:
   - Daniel Bird, PhD, Division of BBS
   - Michael Chaussee, PhD, Division of BBS
   - Samuel Sathyanesan, PhD, Division of BBS
   - Hongmin Wang, PhD, Division of BBS
   - Scott Dreucker, MS, Division of BBS

6. FACULTY DEVELOPMENT COMMITTEE:
   - Gerald McGraw, EdD, Division of BBS
   - Scott Dreucker, MS, Division of BBS
   - Daniel Bird, PhD, Division of BBS
   - Curtis Kost, PhD, Division of BBS

7. MEDICAL EDUCATION COMMITTEE:
   - Steve Waller, PhD, Division of BBS
   - Victor Huber, PhD, Division of BBS
   - William Percy, PhD, Division of BBS
   - Daniel Bird, PhD, Pillar 1 Subcommittee Representative
   - Lee Baugh, PhD, Pillar 1 Subcommittee Representative

8. MEDICAL STUDENT RESEARCH COMMITTEE:
   - Yifan Li, PhD, Division BBS
   - Keith Weaver, PhD, Division BBS
   - Samuel Sathyanesan, PhD, Division of BBS

9. NOMINATING COMMITTEE:
   - Barbara Goodman, PhD, Division of BBS
   (Chair)
   - J. Scott Pattison, PhD, Division of BBS

10. PROMOTION AND TENURE COMMITTEE:
    - Victor Huber, PhD, Division of BBS
    - Robert Morecroft, Division of BBS
    - Brian Burrell PhD, Division of BBS
    - Daniel Bird, PhD, Division of BBS
    - Keith Weaver, PhD, Division of BBS
    - Joyce Keifer, PhD, Division of BBS
    - William Percy PhD, Division of BBS

11. RESEARCH COMMITTEE:
    - Lee Baugh, PhD, Division of BBS (Chair)
    - Scott Pattison, PhD, Division of BBS
    - Samuel Sathyanesan, PhD, Division of BBS

12. STUDENT FINANCIAL AID COMMITTEE:
    - Samuel Sathyanesan, PhD, Division of BBS
    - J. Scott Pattison, PhD, Division of BBS
    - Steve Waller, PhD, Division of BBS

13. STUDENT PROGRESS AND CONDUCT COMMITTEE:
    - Samuel Sathyanesan, PhD, Division of BBS
    - Bruce Cuevas, PhD, Division of BBS
    - Michael Chaussee PhD, Division of BBS
    - Scott Dreucker, MS, Division of BBS
    - Hongmin Wang, PhD, Division of BBS

14. GRADUATE COMMITTEE:
    - XJ Wang, MD, PhD
    - Doug Martin, PhD
    - Keith Weaver, PhD
    - Lee Baugh, PhD
    - Daniel Bird, PhD
15. HEALTH AFFAIRS MEDICAL INFORMATICS COMMITTEE:
   Denise Arrick, MS, Division of BBS
   J. Scott Pattision, PhD, Division of BBS

16. DIVERSITY HEALTH AFFAIRS COMMITTEE:
   Gerald Yutrzenka, PhD, Associate Dean for Diversity

17. UNIVERSITY SENATE:
   Scott Druecker, MS
   Lisa McFadden, PhD
   Hongmin Wang, PhD

17. GRADUATE COUNCIL:
   Steve Waller, PhD, Division of BBS

18. USD ATHLETIC BOARD OF CONTROL:
   Scott Druecker, MS (Chair)

19. USD HONORARY DEGREES COMMITTEE:
   Barb Goodman, PhD (Chair)

20. USD PRESIDENT’S COUNCIL ON DIVERSITY & INCLUSIVENESS:
   Gerald Yutzenka, PhD
### CBBRe RESEARCH ENHANCEMENT PILOT GRANT PROGRAM

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEPARTMENT</th>
<th>TITLE OF PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samuel Sathyanesan &amp; Jason Petersen</td>
<td>Basic Biomedical Sciences &amp; VA Health Care System / Avera</td>
<td>Antidepressant activity of a recombinant neurotrophin</td>
</tr>
<tr>
<td>CY Jiang &amp; YiFan Li</td>
<td>Chemistry &amp; Basic Biomedical Sciences</td>
<td>Development of molecularly imprinted polymers for study of UCHL1 protein-protein interaction</td>
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<tr>
<td>Lisa McFadden &amp; Z. Rick Wang</td>
<td>Chemistry &amp; Basic Biomedical Sciences</td>
<td>Harnessing Nanoscale Super containers to Mitigate Psychostimulant Toxicity</td>
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### CBBRe GRADUATE STUDENT TRAVEL AWARDS

<table>
<thead>
<tr>
<th>NAME</th>
<th>DEPARTMENT</th>
<th>MENTOR</th>
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<tbody>
<tr>
<td>Danielle Hertel</td>
<td>Psychology</td>
<td>Gabrielle Strouse</td>
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<tr>
<td>Tyler Johnson</td>
<td>Sanford Research</td>
<td>Jill Wiemers</td>
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<tr>
<td>Kevin Krupp</td>
<td>Biology</td>
<td>Cliff Summers</td>
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<tr>
<td>Balaranjan Selvaratnam</td>
<td>Chemistry*</td>
<td>Pete Miro-Ramirez</td>
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<tr>
<td>Kulatheepan Thanabalasingam</td>
<td>Chemistry*</td>
<td>Ranjit Koodali</td>
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<tr>
<td>Mariah Hoffman</td>
<td>Biomedical Engineering*</td>
<td>Etienne Gnimpieba</td>
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<tr>
<td>Parvathi Jampani</td>
<td>Chemistry*</td>
<td>Z. Wang</td>
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<tr>
<td>Emily Kalantar</td>
<td>Psychology</td>
<td>Christopher Berghoff</td>
</tr>
<tr>
<td>RuthEllen Anderson</td>
<td>Basic Biomedical Sciences/Pediatrics</td>
<td>Keith Francis</td>
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*Supported by the USD-N3 training grant

### SUMMER PROGRAM FOR UNDERGRADUATE RESEARCH IN ADDICTION (SPURA)

<table>
<thead>
<tr>
<th>NAME</th>
<th>MAJOR</th>
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<tbody>
<tr>
<td>Quinci Herll</td>
<td>Medical Biology</td>
<td>Lisa McFadden</td>
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<tr>
<td>Santina Lokonobei</td>
<td>Biology</td>
<td>Hong Zheng</td>
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<td>Conrad Mohr-Eymer</td>
<td>Chemistry</td>
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<td>Lauren Mattison</td>
<td>Mathematics</td>
<td>Cliff Summers</td>
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<tr>
<td>Rachel Rucker</td>
<td>Medical Biology</td>
<td>Brian Burrell</td>
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<tr>
<td>Danielle Wilson</td>
<td>Psychology</td>
<td>Jessica Freeling</td>
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### CBBRe STAFF TRAVEL AWARDS

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<th>NAME</th>
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<tbody>
<tr>
<td>Kelene Fercho (Fall 2018)</td>
<td>Basic Biomedical Sciences</td>
<td>Lee Baugh</td>
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<tr>
<td>Jordan Sheets</td>
<td>Pediatrics</td>
<td>Keith Francis</td>
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<tr>
<td>Jamie Scholl</td>
<td>Basic Biomedical Sciences</td>
<td>Lee Baugh</td>
</tr>
<tr>
<td>Kelene Fercho (Spring 2019)</td>
<td>Basic Biomedical Sciences</td>
<td>Lee Baugh</td>
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</table>

### CBBRe TRAINEE RESEARCH GRANTS

<table>
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<th>NAME</th>
<th>DEPARTMENT</th>
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<th>TITLE OF PROJECT</th>
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<tbody>
<tr>
<td>Sam Critzer</td>
<td>Basic Biomedical Sciences</td>
<td>Lee Baugh</td>
<td>Body Fluid Balance and Implications for Brain Function</td>
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<tr>
<td>Preston Long</td>
<td>Psychology</td>
<td>Harry Freeman</td>
<td>Oxytocin effects on social capital and pain behaviors</td>
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2018 ACTIVE BBS GRANTS

1. Anderson Ruthellen (Elle), Regulation of pluripotent stem cell differentiation by sterol metabolism, National Institutes of Health - NIH, $480.00 (2/20/2018-2/19/2019)

2. Anderson Ruthellen (Elle), Regulation of pluripotent stem cell differentiation by sterol metabolism, National Institutes of Health - NIH, $49,044.00 (2/20/2018-2/19/2023)

3. Baugh Lee, Consortium for Genetic Influences on Behavioral Health, South Dakota Governor’s Office of Economic Develop, $747,942.00 (7/1/2018-6/30/2019)

4. Baugh Lee, MRI: Acquisition of Transcranial Magnetic Stimulation Instrumentation to Advance Understanding of the Brain, National Science Foundation, $103,871.00 (9/1/2017-8/31/2018)

5. Baugh Lee, Consortium for Genetic Influences on Behavioral Health, South Dakota Governor’s Office of Economic Develop, $408,646.00 (7/1/2017-6/30/2018)


8. Burrell Brian, NRT: USD Neuroscience and Nanotechnology Network, National Science Foundation, $2,943,561.00 (9/15/2016-8/31/2021)

9. Burrell Brian, South Dakota Needs Scientists (SDNS), Howard Hughes Medical Institute, $1,000,000.00 (9/1/2017-8/31/2018)


14. Chaussee Michael, Development of novel vaccines and antibodies/assays to improve human/animal health, South Dakota Governor’s Office of Economic Develop, South Dakota State University - SDSU, $69,836.00 (7/1/2017-5/31/2018)

15. Chaussee Michael, Development of novel vaccines and antibodies/assays to improve human/animal health, South Dakota Governor’s Office of Economic Develop, South Dakota State University - SDSU, $128,483.00 (7/1/2018-6/30/2019)


17. Ghosh Rajeshwary, Defining chaperone-mediated autophagy in the cardiomyocyte and its peptide-based drug applications, American Heart Association, $110,456.00 (7/1/2017-6/30/2019)

18. Goodman Barbara, South Dakota Biomedical Research Infrastructure Network, U.S. Department of Health & Human Services, National Institutes of Health - NIH, $2,848,110.00 (5/1/2017-4/30/2018)


2018 ACTIVE BBS GRANTS


22. Huber Victor, Production of therapeutic human polyclonal antibodies against influenza viruses, U.S. Department of Health & Human Services, Sanford Research/USD, $176,314.00 (8/1/2017-7/31/2018)

23. Huber Victor, Production of Viruses for Challenge, MedGene Labs, $1,274.00 (6/20/2017-6/19/2018)


25. Li Yifan, Induction of ACE2 expression in skeletal muscles in aged mice by transcutaneous electrical stimulation, U.S. Department of Health & Human Services, National Institutes of Health - NIH, $7,271.00 (4/1/2017-3/31/2018)


27. Martin Douglas, Cardiac sympathetic afferent reflex control of venous function, U.S. Department of Health & Human Services, National Institutes of Health - NIH, $7,266.00 (2/1/2018-1/31/2019)


29. Mayhan William, Dysfunction of the Cerebral Microcirculation by In Utero Exposure to Alcohol, National Institutes of Health - NIH, $330,750.00 (9/20/2018-8/31/2019)

30. McFadden Lisa, Dirty Little Secrets: Wastewater Epidemiology Use to Determine Community Drug Use, National Institutes of Health - NIH, University of Nebraska Medical Center, $73,500.00 (7/1/2017-6/30/2018)

31. McFadden Lisa, Dirty Little Secrets: Wastewater Epidemiology Use to Determine Community Drug Use, National Institutes of Health - NIH, University of Nebraska Medical Center, $11,600.00 (7/1/2017-6/30/2018)

32. McFadden Lisa, Serotonergic Changes in the Frontal Cortex During Methamphetamine Reinstatement, U.S. Department of Health & Human Services, National Institutes of Health - NIH, $224,100.00 (1/1/2018-12/31/2018)

33. McFadden Lisa, Serotonergic Changes in the Frontal Cortex During Methamphetamine Reinstatement, U.S. Department of Health & Human Services, National Institutes of Health - NIH, $24,900.00 (1/1/2018-12/31/2018)

34. Miskimins Robin, Dakota Cancer Collaborative on Translational Activity, National Institutes of Health - NIH, University of North Dakota, $78,572.00 (10/1/2018-8/31/2019)

35. Miskimins Robin, Great Plains IDeA-CTR, National Institutes of Health - NIH, University of Nebraska Medical Center, $20,580.00 (9/1/2017-6/30/2018)

36. Miskimins Robin, Great Plains IDeA-CTR, National Institutes of Health - NIH, University of Nebraska Medical Center, $112,000.00 (5/1/2018-6/30/2018)

37. Miskimins Robin, Great Plains IDeA-CTR, National Institutes of Health - NIH, University of Nebraska Medical Center, $17,640.00 (9/1/2018-6/30/2019)


### 2018 ACTIVE BBS GRANTS

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<th>Amount</th>
<th>Start Date</th>
<th>End Date</th>
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<tbody>
<tr>
<td>41</td>
<td>Pattison James, CMA-targeting peptide technology: a novel strategy to selectively clear a cardiac disease-causing mutant protein, National Institutes of Health - NIH, University of Nebraska Medical Center, $73,500.00</td>
<td>(7/1/2017-6/30/2018)</td>
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<td>42</td>
<td>Sathyanesan Samuel, Characterization of trophic factor induced antidepressant action, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $323,326.00</td>
<td>(2/1/2017-1/31/2018)</td>
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<td>43</td>
<td>Sathyanesan Samuel, Characterization of trophic factor induced antidepressant action, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $35,926.00</td>
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<tr>
<td>44</td>
<td>Sathyanesan Samuel, Characterization of trophic factor induced antidepressant action, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $323,181.00</td>
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<td>45</td>
<td>Sathyanesan Samuel, Characterization of trophic factor induced antidepressant action, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $35,909.00</td>
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<td>46</td>
<td>Waller Steven, Center for Cancer Biology Research, U.S. Department of Health &amp; Human Services, Sanford Medical Center, $100,780.00</td>
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<td>47</td>
<td>Waller Steven, Center for Cancer Biology Research, U.S. Department of Health &amp; Human Services, Sanford Medical Center, $52,470.00</td>
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<td>48</td>
<td>Wang Hongmin, Role of ubiquilin in ischemic stroke, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $286,714.00</td>
<td>(8/1/2017-7/31/2018)</td>
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<tr>
<td>49</td>
<td>Wang Hongmin, Role of ubiquilin in ischemic stroke, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $286,714.00</td>
<td>(8/1/2018-7/31/2019)</td>
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<td>Wang Xuejun, The COP9 Signalosome in the Heart, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $364,293.00</td>
<td>(7/1/2017-6/30/2018)</td>
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<tr>
<td>51</td>
<td>Wang Xuejun, The COP9 Signalosome in the Heart, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $364,132.00</td>
<td>(7/1/2017-6/30/2018)</td>
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<tr>
<td>52</td>
<td>Wang Xuejun, The COP9 Signalosome in the Heart, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $363,964.00</td>
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<td>56</td>
<td>Wang Xuejun, Ubiquitin receptors and cardiac proteotoxicity, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $355,250.00</td>
<td>(11/1/2017-10/31/2018)</td>
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<td>57</td>
<td>Wang Xuejun, Ubiquitin receptors and cardiac proteotoxicity, U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $7,250.00</td>
<td>(11/1/2017-10/31/2018)</td>
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<td>58</td>
<td>Weaver Keith, The Fst proteins of Enterococcus faecalis: paradigms for the study of Type I toxin-antitoxin system, National Institutes of Health - NIH, $220,500.00</td>
<td>(7/9/2018-6/30/2019)</td>
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<td>59</td>
<td>Weimer Jill, Developmental Research Program for Medical Students (DRPMS), U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $34,914.00</td>
<td>(8/17/2017-7/31/2018)</td>
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<td>60</td>
<td>Weimer Jill, Developmental Research Program for Medical Students (DRPMS), U.S. Department of Health &amp; Human Services, National Institutes of Health - NIH, $35,432.00</td>
<td>(8/1/2018-7/31/2019)</td>
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</tbody>
</table>
2018 ACTIVE BBS GRANTS

62. Yutrzenka Gerald, Healthcare Careers Summer Camp, Delta Dental Foundation, $6,000.00 (6/15/2017-6/14/2018)
63. Yutrzenka Gerald, Native American Healthcare Scholars Program, U.S. Department of Health & Human Services, $446,671.00 (8/1/2017-7/31/2018)
64. Yutrzenka Gerald, Native American Healthcare Scholars Program, U.S. Department of Health & Human Services, $400,000.00 (8/1/2018-7/31/2019)
65. Yutrzenka Gerald, Rural Health Network Development Planning Program, Health Resources Service Administration - HRSA, South Dakota State University - SDSU, $3,919.00 (7/1/2018-6/30/2019)
66. Yutrzenka Gerald, USD Health Career Camp, South Dakota Department of Health, $15,000.00 (6/20/2018-9/30/2018)
67. Zheng Hong, Novel Target Mechanism (Renal Denervation) to Reduce Sodium Retention in Chronic Heart Failure, National Institutes of Health - NIH, University of Nebraska Medical Center, $187,866.00 (8/15/2017-4/30/2018)
68. Zheng Hong, Novel Target Mechanism (Renal Denervation) to Reduce Sodium Retention in Chronic Heart Failure, National Institutes of Health - NIH, University of Nebraska Medical Center, $193,830.00 (8/15/2017-4/30/2018)

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1. Das M, Baugh LA. Thieme Test Prep for the USMLE®: Medical Neuroscience Q&A. Thieme; 2018 Dec 12.


40. Saúl González-Guzmán,1,2,† Vladimir Paredes-Cervantes,3,4,† Bagu Tshima Edward,5 José A. Crescencio-Trujillo,6 Angel Guerra-Marquez,7 Nancy Rivas,8 Ricardo Alejandro-Aguilar,8 Efraín Bermúdez-Torres,9 and Patricia González-Cano10. Seroprevalence and geographical distribution of sero-positive blood donors to Trypanosoma cruzi at the central blood bank of the National Medical Center “La Raza”.


