
TOXIC | TUMOR | ACID | AIMAR | ASTRO | CASCADE | CONTACT | CYCLE | FORMULA | IPOV | METR | NOSALT |
GEMSTONE HONORS PROGRAM
CITATION & AWARDS CEREMONY
2021
HONORS COLLEGE | UNIVERSITY OF MARYLAND

CONGRATULATIONS TO THE GEMSTONE CLASS OF 2021 ON THE RECEIPT OF THEIR CITATIONS

On behalf of the entire Gemstone community, we express our pride in all of you, our 2021 seniors. You have accomplished much, both in your team research, in your respective majors, and on our campus. The University of Maryland is better because of YOU. Now, more than ever, the world needs you—your commitment to research and the way you have demonstrated your commitment to doing good in your work will make a difference for decades to come.

We have watched you mature into accomplished scholars and leaders. It was evident at our recent Gemstone Thesis Conference that each of your teams worked hard, stuck together and conducted excellent research, all while living through a global pandemic. We are honored to celebrate your accomplishments and can't wait until we can gather in person to formally recognize all that you have done! It is our hope that when it is safe to do so, we will be able to celebrate together and we will share these evolving plans in the coming months.

We hope that your experience of working together in teams has given you skills and friendships that will last a lifetime. We also hope you will continue to be active in our Gemstone community, and that you will keep us informed about the exciting developments in your careers and lives.

Our heartfelt congratulations and warm best wishes go with each one of you!

Dr. David Lovell, Director
Dr. Kristan Skendall, Associate Director
Dr. Vickie Hill, Assistant Director for Operations
Dr. Leah Kreimer Tobin, Assistant Director for Student Engagement

GEMSTONE
HONORS COLLEGE
UNIVERSITY OF MARYLAND

Team ACID

Team Members
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Research Title
A Systematic Investigation on the Medicinal Use of Lysergic Acid Diethylamide

Research Description
Evidence points to several mechanistic relationships where lysergic acid dimethylamide (LSD) alters the serotonergic system in autism spectrum disorders (ASD) and positively impacts ASD-related clinical outcomes. Clinically relevant endpoint measurements resulting from the interaction of LSD with various psychiatric disorders and the etiology of ASD were selected and analyzed for a review. Peer reviewed and publicly available original scientific studies in humans, animal models, or cell cultures with LSD as the primary treatment and a reasonable sample size were included in the search. The endpoints selected for the review fall into the following categories: neurotransmitters, physiological markers, metabolites and intermediates, brain connectivity, brain morphology and histology, receptor activity and expression, and gene expression. The review intends to elucidate a promising mechanism of action through which LSD could be interacting with the factors responsible for the etiology of ASD. The goal of the review is to illustrate the potential for the therapeutic use of LSD and its analogues towards the management of various psychological and neurodevelopmental disorders, including ASD. This review could reveal a refined hypothesis for future research in order to identify specific molecular targets of LSD or its analogues for the treatment and management of ASD.

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TEAM AIMAR (Artificially Intelligent Medical Assistant Robot)

Team Members
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Dana Ronin, *Bioengineering*
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Librarian
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Research Title
Implementing Artificial Intelligence and Robotics to Assist in Healthcare Decision Making

Research Description
Healthcare providers face financial, regulatory, and logistical obstacles in supplying quality care. A physical robotic system coupled with artificial intelligence software can improve patient outcomes and reduce demands on providers by automating data collection and supplementing medical diagnoses. Team AIMAR (Artificially Intelligent Medical Assistant Robot) constructed such a system, which was divided into a robotic base and advanced diagnostic modules. Base functionality consisted of basic navigation, mapping, and conversational abilities. For two prototype modules, AIMAR used a deep neural network to identify skin lesions and utilized natural language technologies to talk to patients and diagnose conditions. Additionally, Team AIMAR created a framework to test and assess the functionality of the fully integrated system in a simulated environment. Many diverse directions exist for future work, including expanding the functionality of the user interface, improving motion and sensing capabilities, and communicating with electronic health record systems.

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Team ASTRO (Assessment of Space Technologies for Robotic Operations)

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Research Title
Robotic Habitat Technologies for Minimizing Crew Maintenance Requirements in Space Habitats

Research Description
The International Space Station (ISS) is crewed continuously by astronauts conducting scientific research in microgravity. However, their work is not limited to scientific research alone; in fact, logistics, maintenance, and repair tasks on the ISS require more than 80% of available crew time, severely limiting opportunities for performing scientific experiments and technological development. NASA is planning a new project known as Gateway (also referred to as the Lunar Orbital Platform-Gateway). This station will orbit the Moon and be uncrewed for 11 months per year. Astronauts will only be present in the outpost for a limited period of time and will not always be available for continuous repairs and maintenance, as is required for Gateway to operate. Therefore, robotic system(s) are necessary to regularly accomplish these tasks both in the absence and presence of astronauts. Throughout this project, Team ASTRO (Assessment of Space Technologies for Robotic Operations) explored the feasibility of integrating dexterous robotic systems in space habitat architectures to perform routine and contingency operational and maintenance tasks. Ultimately, this allows for astronauts, when present, to focus on exploration and scientific discoveries. The team conducted this research through three approaches: Gateway component analog taskboard development and end effector assessment, Cargo Transfer Bag (CTB) manipulation and logistics, and AprilTag situational awareness simulation development. Based on analyses and experimental results gained from this research, the team found that robotic systems are feasible alternatives for space habitat operation. Team ASTRO also determined that AprilTags can be used for optimization of the Gateway design to facilitate uncrewed operations and robotic servicing to improve crew productivity when present.

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Team CASCADE (Comparing Allergic Signaling Chain Antagonists to Inhibit Degranulation Expression)

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Research Title

Computational Screening for Novel Inhibitors of Proteins in the Mast Cell Degranulation Pathway

Research Description

Allergies are a pervasive issue and require novel ways of alleviating symptoms. Existing treatments focus on symptom management and immunotherapy in response to an allergic reaction. However, there is also potential for prophylactic treatment that inhibits molecules involved in the mast cell degranulation pathway, which causes allergic symptoms. We identified compelling target proteins downstream of this pathway including PKC, PLCγ, and PI3K isoforms, the activation of which results in the degranulation of mast cells. We modelled protein-inhibitor binding interactions in PyRx and identified inhibitors with the highest binding affinity to the target pathway proteins. We extended our analysis to ZINC database analogs of the most efficient inhibitors to determine which chemical properties of the inhibitors contributed to the highest binding affinity. The identified inhibitors have the potential to hinder mast cell degranulation, limit histamine and cytokine release, and therefore prevent allergic symptoms, making them ideal targets for future pharmacology research.

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Research Title
A Deep Neural Network-Based Method for Corneal Deformation Mapping

Research Description
Glaucoma, a disease characterized by increased intraocular pressure (IOP), is one of the leading causes of preventable blindness worldwide. Accurate measurement of IOP is essential in monitoring glaucomatous progression in order to deliver treatment and prevent long-term vision loss. Currently, non-contact tonometry, known as an “air-puff test”, is a common diagnostic method despite its inaccessibility, discomfort, high cost, and reliance on a trained professional. To improve upon these shortcomings, we designed a cheaper tonometer integrating a novel depth-mapping neural network with a custom air-puff generation system. We deformed porcine corneas with a controlled-intensity air-puff while imaging the deformation with a single stationary camera\textemdash a contrast to the standard Scheimpflug method. From the footage, our neural network predicted a three-dimensional map of corneal deformations. The network was able to predict a general negative trend between the IOP and the corneal deformation extracted. we compared our results to accepted literature deformation values and ground truth footage, allowing us to determine that the deformation amplitudes were physically plausible. With a more robust imaging setup, we present a promising alternative to traditional IOP measurement methods. Future studies should make the simulated footage more representative of clinical conditions to increase the generalizability of the neural network. Additionally, anatomical differences between porcine and human eyes as well as corneal variability due to socio-demographic differences must be addressed for our results to be applied to clinical settings.

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We would like to thank our mentor, Dr. Scarcelli, for his guidance in our project; the graduate students in his lab, for training us in lab skills and protocol; our librarian, Ms. Rachel Gammons, for helping us pursue and present research; and the Gemstone staff and faculty—Dr. Frank Coale, Dr. David Lovell, Dr. Kristan Skendall, Dr. Leah Kreimer Tobin, Dr. Vickie Hill, and Jessica Lee—for supporting our research endeavors.

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Librarian
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Research Title
Evaluating the Biosorptive Properties of Local Algae to Facilitate Heavy Metal Removal from Contaminated Water

Research Description
Arsenic, cadmium, and chromium are among the major industrial heavy metal pollutants that can cause adverse effects on human and environmental health. Conventional remediation treatments tend to be financially and environmentally disadvantageous. Algal biosorption is an alternative that utilizes the functional groups on algae's surface to remove metals from solution. We tested the remediating capabilities of algae in both a laboratory and prototype setting. We observed how arsenic, cadmium, and chromium were sorbed by the algae at select time intervals. We found that 100% of chromium and arsenic and 35% of cadmium were removed after 24 hours, with peak rates occurring for all three metals at two hours. Results from the prototype show promise, but shortcomings suggest this technology is better suited for use in pretreatment, not for immediate discharge. More research is needed to improve the system's practicality in real world application.

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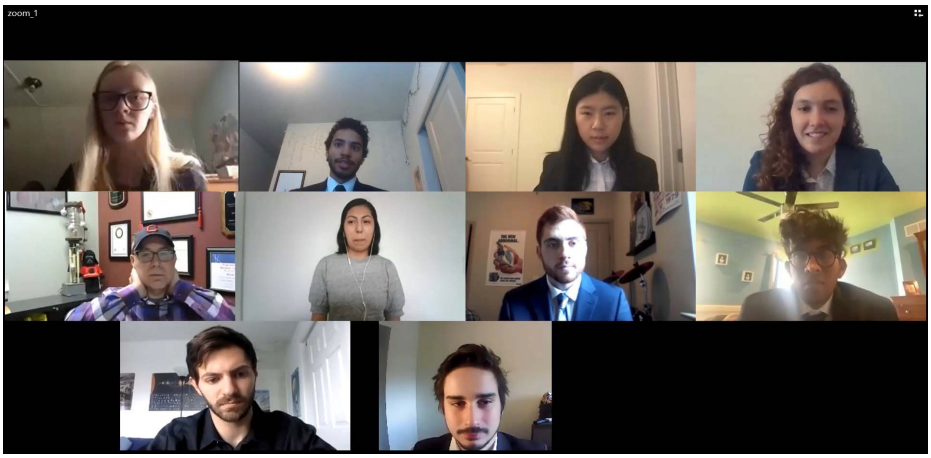
Team FORMULA



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Librarian
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Research Title
Dynamic Wireless Power Transfer Using DC Power

Research Description
Constant stops for charging and lengthy charging times make electric vehicles (EVs) inconvenient to operate for extended travel. Innovative charging methods are necessary if EVs are expected to gain traction in the market over the coming years. Current advancements allow EVs to be charged wirelessly while parked over a charging source. This method does not mitigate the issue of interrupting a trip to spend a significant amount of time charging the vehicle. We theorized that – by expanding on the current technology – EVs could be charged while in motion. The primary goal of this project was to develop a model that optimized the operation of a dynamic wireless power transfer (DWPT) system using DC power. Through a combination of digital simulations and physical tests, the team determined the factors that significantly impacted the power transfer to a receiving wire coil as it moved over a series of stationary transmitting coils. The results were used to confirm the feasibility of a DWPT system and to make recommendations as to the optimum operating conditions.

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Team IPOV (Investigating Parental Opinions on Vaccines)

Team Members
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Faculty Mentor
Dr. Doug Lombardi, *Associate Professor, Department of Human Development and Quantitative Methodology*

Librarian
Judith Markowitz, *University Libraries, UMD*

Research Title
An Analysis of the Factors that Influence Vaccine Hesitancy

Research Description
Due to the current rise of the vaccine hesitancy movement, there has been an increase in vaccine-preventable disease outbreaks (Mnookin, 2011; Reich, 2016). Parental rationalizations for opting out of vaccination vary; however, some of the more commonly cited rationalizations include concerns for the child's safety, distrust of medical professionals, and protection of civil liberties and individual decision-making processes (Glanz et al., 2013). The vaccine hesitancy movement has been propagated through people's consultation of the Internet, friends, and personal opinion publications (Kennedy, Lavail, Nowak, Basket, & Landry, 2011; Vrdelja, Kraigher, Verčič, & Kropivnik, 2018). However, little research exists on how to intervene in parents' decision-making processes regarding vaccines. To address this gap, Team IPOV created and distributed a national survey designed to examine how parents' levels of background knowledge, trust, and personal beliefs regarding the influenza and varicella vaccines predicted vaccination hesitancy. Hierarchical linear regression revealed that trust in vaccinations predicted an appreciable amount of variance in vaccination hesitancy, above and beyond background knowledge. However, personal beliefs, although a significant predictor, only predicted a relatively small amount of variance in vaccination hesitance, above and beyond trust.

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Team METR (Musicians' Experiential Trauma Research)

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Research Title
A Systematic Review of Playing-Related Musculoskeletal Disorders in Musicians Relating to Biological Sex and Instrument Group

Research Description
Playing-related musculoskeletal disorders (PRMDs) are occupational health concerns that have been shown to affect many musicians and other performing artists by causing discomfort and, in some cases, chronic pain or disability. This meta-analysis gives an overview of the prevalence and incidence rates of PRMDs and investigates potential associated factors including biological sex and instrument type. Methods: We utilized a systematic review to address whether disparities in prevalence were observed based on biological sex and instrument played, and whether instrument choice was associated with previously reported disparities in PRMD prevalence between biological males and females. Six literature databases were searched for cross-sectional studies, longitudinal studies, and randomized control trials for which a pre-intervention or baseline prevalence or incidence rate could be determined for males or females, or for specific instruments. Articles published at any time before August 13, 2020 were included for eligibility evaluation. Studies were evaluated by two reviewers for methodological quality using the Loney Scale, and data was extracted, summarized, and statistically evaluated in a meta-analysis. Results & Conclusion We identified 5961 articles in our initial search, 146 of which met eligibility criteria for methodological assessment using the Loney Scale. It is predicted that prevalence rates will be higher for females than males, and that these differences could be explained by instrument choice. Such results would support the hypothesis that instrument choice could potentially explain the higher reported prevalence of PRMDs in females than males as often seen in the literature.

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Team NOSALT

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Librarian
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Research Title
Alternative Methods of Desalination for Sub-Saharan Africa: A Review of Prefiltration and Microbial Desalination Cell Technology

Research Description
Our research project has addressed the global need for greater accessibility to potable drinking water, specifically within the regions of sub-Saharan Africa. Initially, we planned to design a unique desalination system that was composed of a pre-filtration unit, a microbial desalination cell (MDC) and a post-desalination treatment unit. When in-person lab work was no longer feasible due to COVID-19 guidelines, we refocused our project to review the construction, efficiency, and cost-effectiveness of the different designs of potential prefiltration units and MDC configurations. Our review of potential prefiltration systems included both chemical and physical separation methods, and the review of the MDC included the air-cathode, bio-cathode and stacked configurations. While researching the technical details of the prefiltration and MDC systems, we also considered the cultural and societal impacts of introducing a technology such as the MDC into our project region. Our project started as an analysis of an emerging technology, but as the team has grown, the project has transformed into a comprehensive review of the emerging microbial desalination technology and the societal impacts of implementing it into some of the water scarce regions of coastal sub-Saharan Africa.

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Research Title
Interpretability in Computational Toxicology

Research Description
A barrier to the incorporation of predictive models for drug design lies in their lack of interpretability. To this end, we examine on three fronts the interpretability of benchmark models for the 2014 Tox21 Data Challenge, an initiative in the domain with a dataset of measurements across twelve toxicity experiments. On the existing measures of model performance, we assess the current benchmark metric's ability to describe model behavior and recommend a set of metrics for the task. On the existing interpretability methods for machine learning models, we quantitatively and qualitatively evaluate their application to this domain by measuring desirable properties of explanations they produce. On the existing representations of molecules, we propose the addition of electrostatic potential data as novel model input and observe its resulting model performance and model interpretability.

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Kevin K. Wendeu-Foyet, *Physiology and Neurobiology*

Faculty Mentor
Dr. Peter Kofinas, *Chair and Professor, Chemical and Biomolecular Engineering*

Librarian
Jordan Sly, *University Libraries, UMD*

Research Title
Localizing Chemotherapeutic Drug Release to Treat Stage III Colorectal Cancer

Research Description
Current cancer treatments, such as systemic chemotherapy, induce several complications affecting the entire body. Localizing chemotherapy to the tumor site has the potential to minimize these harmful side effects. Solution blow-spinning (SBS) offers the possibility of incorporating chemotherapy drugs into a polymer solution through the use of a compressed airbrush. This would allow for direct deposit of a polymer mat after surgically removing the tumor. Sutures, in combination with polymer sealants, could be used to prevent complications after surgery. This study focuses on stage IIIA colorectal cancer because cancer cells have not spread distantly yet and treatment typically involves surgery followed by chemotherapy. Three key aims were addressed in this study to assess polymer-drug combinations' compatibility with SBS, observe drug release patterns, and evaluate the effect of drug incorporation on polymer adhesion to intestinal tissue. Our results suggested that the polymer-drug combination of poly(L-lactide-co-ε-caprolactone) (PLCL) and capecitabine show promise as an adhesive surgical sealant with a drug release pattern that is complementary to a typical resection healing timeline.

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Gemstone Award Descriptions & Past Gemstone Award Winners

Special thank you to our Gemstone Alumni Awards Committee
Zeke Gonzalez '16, Thomas Haun '05, Ryan Hoffmaster '06, Katherine Mann '11,
Marquise Singleterry '17, and Hannah Tolley McGraw '10

Gemstone Rookie of the Year
This award recognizes an outstanding first year Gemstone student who has demonstrated enthusiasm for interdisciplinary research and commitment to involvement in the Gemstone Honors Program.

2013	Emily Ruppel	2017	Eli Fastow
2014	Pradip Ramamurti	2018	David Polefrone & Mansu Shrestha
2015	Eliot Frank	2019	Logan Swaisgod
2016	Saul Schaffer	2020	Ethan Green

Most Valuable Team Member Award
This award recognizes a student who has demonstrated excellent organizational, interpersonal, and communication skills and has played a key role in clearly motivating his or her team over the past year.

Sophomore Winners

2013	Devon Freudenberger	2017	Thea Ornstein
2014	Parinaz Fathi	2018	Linnea Warburton
2015	Adam Berger	2019	Stephanie Moy
2016	Prateeti Sarkar	2020	Gillian Lee

Junior Winners

2013	Eric Kazyak & Natalie Anzures	2017	Cassidy Laidlaw
2014	Timothy McLaughlin	2018	Greg Krasnoff
2015	Isha Agarwal	2019	Abdulfatal Fakoya
2016	Chris Rother	2020	Aranya Banerjee

Mentor of the Year (Sophomore and Junior Teams)
This award recognizes an outstanding Gemstone faculty mentor who has provided dedicated service to a sophomore or junior Gemstone team.

2013	Dr. Lance Yonkos & Dr. Matthew Roesch	2018	Dr. Lex Schultheis
2014	Dr. Tom Miller & Adam Behrens	2019	Dr. Margret Bjarnadottir, Dr. Sean Barnes, & John Daristotle
2015	Dr. Susan Dwyer & Dr. Zhengguo Xiao	2020	Stephanie Yarwood
2016	Dr. Debu Biswas & Jon Hoffman		
2017	Dr. Ryan Sochol & Dr. Mark Fuge		

Gems Camp Leader of the Year
This award recognizes an outstanding Gems Camp Leader who has demonstrated enthusiasm for the program and eagerness to orient and interact with first-year students at Gemstone's annual Gems Camp.

2015	Eileen Ser	2018	Emma Margolis
2016	Becky Vanarsdall	2019	Divya Kapoor
2017	Caroline Simon	2020	Michael Piqué

Outstanding CONNECT Mentor
This award recognizes an outstanding CONNECT peer mentor, who has demonstrated enthusiasm for the program, eagerness to orient first-year students, and dedication to working with other mentees to enhance the experience.

2015	Tracy Sebastian	2018	Humza Yahya
2016	Erin Verni	2019	Haley Mullen
2017	Kayla Sukri	2020	Imran Khawaja

Outstanding Section Leader
This award recognizes an outstanding section leader (GEMS100, GEMS102, GEMS104, or GEMS202) who has demonstrated enthusiasm for the program and has gone above and beyond with their teaching responsibilities.

2015	Kara Higgins	2018	Shireen Khayat
2016	Annelise Buck & Elizabeth Corley	2019	Soma Umeozulu
2017	Alex Boukhvalova & Lara Fu	2020	Haley Mullen

Robert McDermott Fearless Award
This award was created in 2018 in remembrance of Robert McDermott. Each year, this award is given to the Gemstone student that best exemplifies the qualities that made Robert such a valued member of our community. Nominees must exhibit general optimism, resilience, and dedication in the face of adversity with a sense of self-awareness of their strengths and weaknesses that allows them to provide creative solutions to adapt their own skills and abilities for the purposes of their project. Above all, nominees should be those that bring a "can do" attitude to any challenge they face and prioritize their Gemstone project throughout their time in their program.

2018	Robert McDermott	2020	Ria Sebastian
2019	Daniel Lay		

Gemstone Senior Awards

Outstanding Gemstone Citizen and Leader

This Program could not function without the involvement of so many students. This award goes to a graduating student who has demonstrated enthusiasm, constant involvement and leadership within the Gemstone Program. Those considered for this award are nominate by their peers and have been very involved in the Gemstone Program outside of his or her team by holding positions of leadership, planning events, or serving as a positive role model for the Program.

2002	Jeremy Rachlin	2012	Jillian L. Chavis & Joshua G. Lacey
2003	Sara McKelvey & Soroush Rais-Bahrami	2013	Jaishri Shankar
2004	Emily Beckstrom & Andy Smith	2014	Jessica Lee & Taylor Hearn
2005	Thomas Haun	2015	Ed Lin
2006	Ryan Hoffmaster & Justin Waltrous	2016	Ilana Green & Zeke Gonzalez
2007	Nikhil Joshi & Greg Teitelbaum	2017	Marquise Singleterry
2008	Anita Kohli & Teddy Tien	2018	Allison Chen
2009	Pratik Davè & Lindsey Mooney	2019	Cristina Hnatov
2010	Hannah Tolley	2020	Emma Margolis
2011	Akhila Iruku & Katherine Mann		

Outstanding Gemstone Team Scholar

This honor will be awarded to a student who has been intellectually engaged and highly involved on their Gemstone team. This award goes beyond the normal leadership behavior of organizing the group, motivating members and running meetings. Nominees for this award should be students that have taken the intellectual leadership role and have served as a driving force behind the topic and content of the research. We strive to give the award to a student who demonstrated passion for the team's topic and was truly engaged in the subject matter.

2002	Elizabeth Flynn and Philip Jones	2012	Matthew Conway
2003	Robert Schroll	2013	Alex Mamunes
2004	Christian Klein	2014	Sudi Jawahery
2005	Gregory Crosswhite & Ashley Naimaster	2015	Katerina Christodoulides
2006	Alan O'Connor	2016	Andrea Bajcsy
2007	Emma Simson & Travis Young	2017	Megan Dang & Elfadil Osman
2008	Neil Agarwal & Robert Vocke III	2018	Prableen Chowdhary & Sarah Frail
2009	David Chen & Gregory Hitz	2019	Morgan Janes
2010	Stephanie Galanie & Ben Tousley	2020	Shifali Mathews
2011	Junjie Hao & Angela Lee		

Outstanding Gemstone Team Leader

This award recognizes a student who has demonstrated excellent organizational, interpersonal, and communication skills and has played a key role in clearly motivating his or her team over the past three years.

2004	Jamille Bigio & Phil de Souza	2013	Sebastian Serrano
2005	Philip Brazio & Lauren Schlanger	2014	Yoon Shin
2006	Sumair Akhtar & Margaret Distler	2015	Devon Freudenberger
2007	Kristin Freese & Patrick Hughes	2016	Natalie Griffin
2008	Christina Walsh	2017	Meredith Pecukonis
2009	Elizabeth Dillon & Lee Stearns	2018	Anna Harrison
2010	Nick Asendorf & Kelsey Merrick	2019	Cara Schiksnis
2011	Jasjeet Khural & Adam Pampori	2020	Linnea Warburton
2012	Timothy L. Crisci & Tina Zhang		

Outstanding Gemstone Team Presentation

As a requirement of the Gemstone Program, teams are expected to write and defend a thesis. Teams are given 25 minutes at the Thesis Conference to communicate three years' worth of research to an audience of experts, families, and friends. The honor of the Outstanding Presentation is awarded based on a team's clarity, creativity and overall presentation style. No nomination is required to be considered for this award.

2002	Non-Lethal Weapons	2012	FLIP
2003	Global Ed-Venture	2013	KERMIT
2004	Innovations	2014	ADDICT
2005	SmartRoads	2015	Bass
2006	PlayInc	2016	Brain Blast
2007	Team URBAN	2017	NATURE
2008	Binge Drinking	2018	GOLD
2009	iGem	2019	SPACE
2010	IMAC	2020	LYTIC
2011	Cogeneration Technology		

Gemstone Team of the Year

A new addition to the annual recognition of exceptional students, teams, mentors and librarians, this award recognizes a team that truly exemplifies the values of the program.

2014	MEGA	2018	VIRUS
2015	VIRTUAL	2019	OYSTERS
2016	SAVIOR	2020	ART
2017	PIEZO		

Outstanding Gemstone Mentor

This award recognizes an outstanding Gemstone faculty mentor who has provided dedicated service to and demonstrated exemplary support and guidance of his or her team. This honor is based on nominations from the students

2002	Dr. Greg Baecher	2012	Sameer Shah
2003	Dr. Colleen Farmer	2013	Dr. Stephanie Grutzmacher
2004	Dr. Ray Adomaitis & Dr. Linda Schmidt	2014	Dr. Peter Mallios
2005	Dr. Gilmer Blankenship	2015	Dr. Andrew Ristvey
2006	Dr. Frank J. Coale, Dr. Francey Kohl, & Dr. Jim Purtilo	2016	Dr. Marcio Oliveira
2007	Ms. Karen Thornton & Dr. James Milke	2017	Dr. Matthew Roesch
2008	Dr. David Tilley	2018	Bryan Quinn
2009	Dr. Lowell Adams & Dr. Rama Chellappa	2019	Dr. Jin-Oh Hahn
2010	L. Curry Woods	2020	Joanna Goger
2011	Dr. Kevin Sellner & Dr. Charlie Carr		

Gemstone Librarian of the Year

This award recognizes an outstanding librarian for his or her dedication to the Gemstone Program and team research. It is awarded to the librarian who has demonstrated exemplary support and guidance of his or her senior team. This honor is based on nominations from the students.

2014	Nevenka Zdravkovska	2018	Kelsey Corlett-Rivera
2015	Robin Dasler	2019	Dr. Sarah Over
2016	Celina McDonald	2020	Nevenka Zdravkovska
2017	Eric Cartier		

James M. Wallace Outstanding Gemstone Team Thesis

This award recognizes the team with the best submitted thesis based upon feedback from discussants, mentors, and the Gemstone staff. No nomination is required to be considered for this award.

2002	Fish Sustainability and Innovative Tracking Systems	2012	FACE
2003	Ecodynamics and Universal Playgrounds	2013	Solar Campus
2004	GEMS: Generating Eager Minded Students	2014	ELECTRODE
2005	SWAMP	2015	CLOT
2006	Phosphorus Agriculture Runoff Management	2016	Haptic
2007	TRACK	2017	INJECT
2008	CRABS	2018	ARM IT
2009	Renewables at UMD	2019	DIVA
2010	CHIP	2020	VISOR
2011	BREATHE		

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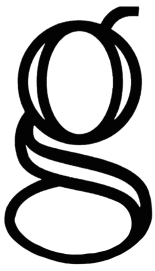

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