Cancer can be a devastating diagnosis and to add insult to injury, one of the most common treatments, chemotherapy, comes with a host of nasty side-effects. One of those is post-chemotherapy cognitive impairment, known colloquially as “chemobrain.”

Common symptoms include problems with motor control, memory, and attention. About half of all patients who undergo chemotherapy will experience chemobrain symptoms.

One UWM neuroscientist is hoping to help with that.

UWM Psychology professor Adam Greenberg and his lab have received a three-year grant from the Greater Milwaukee Foundation to study chemobrain, paying close attention to who it affects and how severely. Working with the Medical College of Wisconsin and recruiting cancer patients from Froedtert hospital, Greenberg hopes that he’ll be able to shed some light on what has, so far, been a poorly-studied side effect of chemotherapy.

“Only in the last 12 to 18 months has the field turned its efforts toward funding research to try and understand what chemobrain is, and then ultimately see if we can find ways to get around this problem and get people a better quality of life after they finish treatment,” Greenberg said.

Greenberg’s research is two-fold. The first step is an experiment to gain a better understanding of what chemobrain actually is and how it affects patients. To that end, Greenberg is conducting a longitudinal study by recruiting people who have just received a cancer diagnosis to undergo a range of behavioral and neuropsychological tests before they begin chemotherapy – what he calls Time Point 1 – and then repeat the tests three to six months later, after their treatment is complete, at Time Point 2.

From the racial justice to medicine to poetry, our faculty, students, and alumni in the College of Letters & Science have an array of fascinating passions.

This year, we are proud to bring you several special editions of In Focus that highlight one area of interest and the many ways the people of the College of Letters & Science approach it.

This month, we shine a spotlight on the battle against cancer.
Biochemistry student takes steps to synthesize cancer drug

By Sarah Vickery, College of Letters & Science

Tryprostatin is a microtubule inhibitor, a drug that inhibits cellular proliferation. That means it’s an effective cancer treatment, since cancer is caused by cells dividing too rapidly without stopping.

Unfortunately, it’s a tough drug to make, requiring 11 separate steps in the lab to synthesize it.

Adam Aleiou is hoping to get it down to five.

Aleiou graduated in 2017 with a Biochemistry major and a pre-med track. Much of his undergraduate career was spent in Organic Chemistry Professor M. Mahmun Hossain’s lab, where he and several other students worked to synthesize Tryprostatin. They aimed to make it in just five steps, significantly decreasing the time and cost of producing the drug.

Aleiou presented his research at the UWM Undergraduate Research Symposium in April. He successfully completed the first three steps in the five-step process.

“The only will this help people medically; it has the potential to reduce the cost of the drug, making it more affordable,” Aleiou said. “You’re producing something in less steps, so you’re using less money to produce that compound. You can put that money toward a different research, which I think is pretty important. Finding different routes to treat cancer has many potential benefits.”

Synthesizing a cancer treatment drug is anything but efficient, however.

“A lot of it comes down to chromatography and patience,” Aleiou joked. “You come into the lab and set up a reaction. To set up a reaction takes maybe an hour or two because you have to thoroughly sterilize all the glassware you’re going to be using. After that, you have to precisely calculate how much of each
Across the board, African Americans die from cancer at 25 percent higher rate than whites, and are generally more likely to have higher mortality rates than whites for every type of cancer. Looking at just prostate cancer, black men are more than twice as likely to die after a diagnosis than white men.

These disparities are sobering, and Maya Matabele is determined to do what she can to change them.

Matabele is a Biochemistry major on the pre-med track. She spent her summer interning at the Medical College of Wisconsin through the Community Health Internship Program (CHIP) run by the Wisconsin Area Health Education Centers, and her job was to study and track the racial disparities among cancer diagnoses.

“The Cancer Center at the Medical College of Wisconsin is a great space,” Matabele said. “My internship was under Dr. Melinda Stolley. She focuses on underrepresented populations in Milwaukee. I was looking at prostate cancer in African American men, and adapting lifestyle intervention – once men receive a diagnosis, how are they coping with the subsequent lifestyle changes?

“It’s been amazing,” she added. “I loved the team I worked with. Their passion and dedication to Milwaukee’s community and southeastern Wisconsin in general is extraordinary and evident in their work.”

Researching disparities among different racial communities is time-consuming and labor-intensive. In addition to seeking out journal articles and materials detailing others’ research into the problems, she and the MCW team hit the Milwaukee pavement, traveling to community clinics and health fairs to recruit black men to join in MCW studies and to spread the word about cancer screening and prevention.

It’s hard to attribute these disparities to one particular cause, Matabele said. MCW focuses on three possible modalities. No. 1 is cellular – is there a genetic or biological component to account for the difference in cancer mortality rates among different racial groups? No. 2 is clinical – do certain groups have trouble accessing adequate care? And No. 3 looks at community – do community attitudes or lack of resources contribute?
Physicist lands funding to study the ‘origami of life’

By Laura Otto, University Relations

Now that the human genome has been mapped, we know more about the role of genes in the body. But proteins are the actual workhorses of genetic instruction, carrying out every function needed for life. So, it makes sense that protein processes also hold valuable information about disease.

UWM biophysicist Ionel Popa is investigating how proteins carry out their essential work – a shape-changing process called “protein folding.” A better understanding of protein folding holds insight into some diseases, including cancer, which begin when a protein misfolds, he says.

Popa, who joined the UWM physics faculty in 2015, was recently recognized with a Shaw Scientist Award from the Greater Milwaukee Foundation. The 30-year-old program has supported early-career researchers from UWM or UW-Madison working in biochemistry, biological sciences and cancer research.

He is using the $200,000 grant to investigate how proteins assemble and change while folding and unfolding at the cellular level in order to accomplish an enormous number of bodily functions. In particular, he wants to know how mechanical forces at specific sites inside the body affect proteins as they fold or unfold.

What is protein folding and how much do we know about it?

Proteins are worker bees of the cells. A single protein makes a chain made from 20 different types of amino acids, as encoded by the genes. The protein then needs to fold into three-dimensional shape in order to execute its function. This process is called protein folding.

Protein folding or unfolding can involve mechanical forces that are specific to the particular cell’s environment. The interplay of these forces acts as mechanical signaling to nearby cells, tissues and organs. It’s one of the most complex self-organization processes in nature.

Help us visualize a protein at work.

Think of a protein as multiple knots on a rope. When they are “folded,” all the knots are tight and the rope is stiff. In their unfolded state, the rope is relaxed and the knots are loosened. Applying force to the unfolded state exposes hidden parts that can now interact with the environment.

By increasing the amount of force, you expose more sites that can form more linkages. A protein domain is 4 to 5 nanometers, but can expand to between 10 and 50 nanometers, depending on the force applied. It’s like construction of a building. You connect to what’s there, reinforcing as you add floors.

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Communication graduate helps widen the Given Circle  

By Sarah Vickery, College of Letters & Science

Robyn Cherry is convinced that a higher power was involved the day she met Cynthia Hooker in second grade.

“We are best friends, and when she decided to start her organization, I had the know-how to help her create her brand,” Cherry said. “I always had this innate urge to be in communication, and I think that for me to have gained all of the knowledge and experience that I had up to that point, that there was some divine intervention that we stayed friends this long.”

Hooker is the founder of Cynthia’s Breast Cancer Giving Circle, a Milwaukee-based charity that raises money to help cancer patients and their families deal with their expenses. As a survivor of two bouts of breast cancer, Hooker was inspired to start CBCGC after she struggled to pay bills during her treatment.

There was one problem: Hooker didn’t know how to get her message across. Cherry did.

Cherry is a familiar voice over the Milwaukee airwaves. She began her broadcasting career as a control board operator for WTMJ radio and later became the station’s overnight news anchor. From there she traveled to WUWM, run under the umbrella of the College of Letters & Science. Cherry was a producer and fill-in host for the At 10 show, which has since been renamed “Lake Effect.” She also hosted her own show called “City Talk” exploring issues surrounding cultural diversity in Milwaukee.

From WUWM, she forayed into the print world with Strive Media, a now-defunct organization that helped youths wet their feet in the world of journalism and publications. While at Strive, Cherry also became the editor of Girlfriend’s Health Magazine for Women of Color. However, her talent for radio couldn’t be overlooked; Cherry was quickly recruited to WYMS to become a morning show co-host. Later she worked as a fill-in host for Eric Von on 1290 WCMS and for Wisconsin Public Radio as a producer for the Joy Cardin show.

Cherry did it all without a college degree. She had begun taking classes at UWM in the ‘80s, but put her education on hold when her career took off. In 2011, she majored in Communication and earned her Bachelor’s degree, then followed up with a Master’s degree in 2013.

All of her experience and education meant that when Hooker needed help, Cherry was able to provide it.

“It was very natural; I just started helping out. I interviewed her on the radio when I was fill-in hosting, and at first she was pretty shy about it,” Cherry said. “I told her, you can’t be in the background. You are the face of this organization. I coached her; I created the talking points. Cynthia was a pro by the time the interview was over.

“And now, Cynthia is not shy about doing media. … I will take credit for that,” she added with a laugh.

Cherry’s considerable media experience made her a natural fit to spearhead public relations for CBCGC, but she also credits UWM for giving her the skills she needs to be effective at her volunteer position.

“UWM taught me how to write,” Cherry said. “My lecturers and professors taught me how to write coherently, how to tell a story, how to open with your thesis statement. You cannot work in media in any way, shape, or form, without writing skills.”

In the seven years since it was founded, CBCGC has raised more than $60,000 for patients struggling with need and formed partnerships with several regional healthcare systems, including Aurora, Wheaton Franciscan, and Columbia St. Mary’s. Cherry personally has participated in fundraisers, coordinated media exposure, and even hand-delivered Thanksgiving meals to cancer patients and their families.

It can be draining, especially when patients pass away. Still, Cherry said, that doesn’t stop her from doing all she can to help.

“Think about what your passion is. Cynthia and I are fortunate in the sense that we really like to help people,” Cherry said. “What’s your passion? What’s your talent? And how can your talent help make another person’s plight better?”
Martin Luther’s 95 Theses were written in 1517 to challenge what Luther saw as abusive practices by the Catholic Church.

This year is the 500th anniversary of the publication of Martin Luther’s famous “95 Theses,” often viewed as the event that triggered the Reformation.

For Merry Wiesner-Hanks, it’s an opportunity to reflect on the upheaval of the European Reformation, but also its echoes in today’s world.

Wiesner-Hanks, a UWM distinguished professor of History and Women’s and Gender Studies, is an internationally recognized scholar of early modern Europe, especially issues of gender and the Protestant and Catholic Reformations.

She has written extensively about Luther, the Reformation and modern Europe, and has translated a number of writings by Luther and accounts by his contemporaries.

The phenomenon of religious refugees is one we share with the Reformation, Wiesner-Hanks points out.

“Some say we should consider expulsion of the Jews from Spain in 1492 as the beginning of the Reformation, because it marks the beginning of a period of mass religious refugees,” she says.

Another parallel: Just as the Roman Church may have looked askance at a German friar starting his own version of Christianity, today we see the future of Christianity is no longer solely in the hands of Europeans and their descendants around the world.

“The big kickoff of the ‘Luther Year’ took place last fall in Lund, Sweden, and featured Pope Francis and Bishop Munib Younan, then head of the Lutheran World Federation,” she said. “Here you had an Argentinian and a Jordanian representing these two great religions.”

Wiesner-Hanks noted that both leaders spoke directly to the question of refugees.

“The Amish, Hutterites, Mennonites all came to America as religious refugees,” she says. “Now we see Yazidis, Syrians and others leaving their homes to escape conflict and persecution.”

From the outset, a large portion of Wiesner-Hanks’ career has been devoted to social history, particularly the lives of women in early modern Europe. She was honored at the Sixteenth Century Society and Conference in October, along with frequent collaborator Susan Karant-Nunn, for her pioneering work on gender in the Reformation.

“You can’t talk about the Reformation without talking about gender,” Wiesner-Hanks says.

Among her many publications is “Luther on Women: A Sourcebook,” a collection of Luther’s writings selected and translated by Wiesner-Hanks and Karant-Nunn. The book includes some of the so-called “table talks,” accounts by friends and students of discussions with Luther at his dinner table, which could have 20-30 guests on any given night.
“They are great fun,” she laughs. “Chitchat lubricated by his wife’s beer.”

Luther had a complex view of women. He was opposed to a celibate clergy, maintaining that sex was natural (though he viewed original sin as largely sexual in character). Moreover, as a seminarian and friar, his exposure to women was mainly as servants, and he shared with his male contemporaries a somewhat disdainful view of women.

But Wiesner-Hanks also came to see that Luther was deeply devoted to his wife and daughters. The loss of a daughter comes alive in a moving letter to a colleague.

“He’s just choked up with emotion,” she says. “You can just hear it through the centuries.”

So, while Luther was as chauvinistic as any of his contemporaries, “I ended up having a more positive view of Luther than I expected.”

In more recent years, Wiesner-Hanks has turned her scholarship toward world history, and so puts the European Reformation in a global perspective.

In her book “Religious Transformations in the Early Modern Period,” she looks at religious changes and developments in the same time period in other parts of the world, examining them in a comparative way.

An example is Sikhism, whose founder, Guru Nanak, is an exact contemporary of Luther. He has similar views: He rejects asceticism in favor of family life, argues that scripture should be in the language people think, and he’s a monotheist.

One may wonder why the European Reformation is echoed in other reform movements, such as Sikhism, and in China, Confucianism.

“Some of it’s related to technology, notably the printing press, but also just a general reaction to a kind of staleness in the dominant religious of those times and places,” Wiesner-Hanks says.

The printing press was certainly a boon to Luther, allowing his writings to be broadly and quickly disseminated. In some years, a quarter of the books printed in Germany were written by Luther.

“He’s the first person to really brand himself,” Wiesner-Hanks says. “He was trying to persuade persons by argumentation, but also by PR.”

Consequently, she says, Lutheranism spread with astonishing speed: Within 10 years it was adopted in Scandinavia and many German principalities and cities.

The anniversary has put Wiesner-Hanks in demand as a speaker. During the Year of Luther, she’s given talks around the country, as well as locally.

Wiesner-Hanks regards the recognition by the Sixteenth Century Society and Conference, the primary scholarly society of the period, as a validation of a dramatic change in Reformation scholarship.

“When I started in the biz, there were basically no women, and nobody talked about women,” she laughs. “Now Reformation studies has become very gender-conscious.”

But she’s also personally pleased with the honor. “They never do that, so we were really flabbergasted,” she said.
November 29
Planetarium Show: The Ancient Egyptian Sky. 7 p.m. Manfred Olson Planetarium. Tickets are $5. Travel the Nile and see its sky. [http://bit.ly/2BeyFSG]

November 30


United We Read Student/Faculty Reading Series. 7 p.m. Woodland Pattern Book Center, 720 E. Locust St., Milwaukee. Readings by Valerie Laken, Elizabeth Hoover, Cesca Janece Waterfield, and Karisa Langlo. [http://bit.ly/2zsQ64y]

December 1
Neuroscience Symposium: A time for change – Plasticity in circadian clock circuits. 2 p.m. Lapham N101. Jennifer Evans, Marquette University.

Geography Colloquium: Samuel Beckett’s Radio Geographies. 3 p.m. AGS Library. Andrew Kincaid, UWM.

Physics Colloquium: Feedback in Dwarf Galaxies at z > 2. 3:30 p.m. Lapham 160. Ryan Trainor, Franklin & Marshall College.

Planetarium Show: Color of the Cosmos. 7 p.m. Manfred Olson Planetarium. Tickets are $5. Show runs Fridays Dec. 1-15 at 7 p.m. and at 2 p.m. on Dec. 3. [http://bit.ly/2iHxFRX]


December 3
Planetarium Show: Color of the Cosmos. 2 p.m. Manfred Olson Planetarium. Tickets are $5. Show runs Fridays Dec. 1-15 at 7 p.m. and at 2 p.m. on Dec. 3. [http://bit.ly/2iHxFRX]

Archaeological Institutes of America, Milwaukee Society, presents Myths and Mysteries: Underwater Archaeological Investigation of the Christmas Tree Ship, Rouse Simmons. 3 p.m. Sabin G90. [http://bit.ly/2jfJBPi]

December 7

December 8
Geography Colloquium: Examining Human Heat Stress with Remote Sensing Technology. 3 p.m. AGS Library. Yang Song, UWM.

Biological Sciences Colloquium: New insights into the molecular mechanisms of adaptation to stress. 3:30 p.m. Lapham N101. Maria Hatzoglou, Case Western Reserve University. [http://bit.ly/2ztPYf]

Physics Colloquium: Rethinking the Fundamentals of Classical Nova Explosions. 3:30 p.m. Lapham 160. Laura Chomiuk, Michigan State University.

December 10
Holiday Sing-Along at the Planetarium. 2 p.m. Manfred Olson Planetarium. Tickets are $5. Add your voice to the UWM Collegium Musicum directed by Tim Sterner Miller. [http://bit.ly/2mSNzdX]

December 14
Emile H. Mathis Gallery Grand Opening. 5 p.m. Emile H. Mathis Gallery, Mitchell Hall. Free and open to the public. See the debut of the university’s renovated art gallery and enjoy premiere pieces on display from the UWM Art Collection. [http://bit.ly/2AnUull]

Laurels, Accolades, and Grants

PhD student Chudamani Poudyal (Mathematical Sciences) was awarded first place at the 52nd Actuarial Research Conference (ARC) at Georgia State University for his talk, “T-Estimation for Insurance Loss Data.” [http://bit.ly/2z3Flgn]
Planetarium Spotlight

The UWM Planetarium recently had the pleasure of collaborating with the Roberto Hernández Center and UWM Sociocultural Programming to put on a special event: Mother Earth, Father Sky: The Taíno Culture. The Taíno were an indigenous group of the Greater Antilles/Caribbean (which include islands and countries such as Cuba, Jamaica, and Puerto Rico). Our special guest speaker, Luis Lopez, was able to bring in dozens of unique, genuine artifacts from the Taíno people. These artifacts ranged from prized jewelry, to pipes, to even an original stool that was designed for tribal leaders of the Taíno.

Guests were also treated to a live dance and musical performance. The night was topped off by special Caribbean-themed catering including handmade cookies with the Taíno symbol for the sun crafted onto them. Many audience members shared their knowledge of this important culture.

Italian Spotlight

In honor of the Week of Italian Cuisine in the World, UWM hosted Massimo Montanari, professor in Medieval History and Food History at the University of Bologna in Italy. He delivered a lecture on “Food Culture, Italian Identity” that included a demonstration by a Mariette from Casa Artusi. The talk and demonstration attracted a broad audience, with students, faculty, and many members of the community.

Italian professor Robin Pickering-Iazzi also organized and hosted a Skype talk and discussion which featured the activist Edoardo Zaffuto. He is an original co-founder of the famous non-profit organization Addiopizzo in Palermo Sicily, which works to create a legal economy and mafia-free Sicily, opposing all corruption, political and otherwise. He gave his talk to the students in the Italian 145 course on the Italian mafia and antimafia, with a discussion afterwards. His talk is incredibly informative and powerful, and can be accessed now at https://youtu.be/ZXgYzD8cupY.
Alumni Accomplishments

Each year, the Milwaukee Business Journal compiles a list of Milwaukee area “power-brokers” – “people who others turn to when they need to get something done” (http://bit.ly/2zkg9uf). Included in the 2017 Milwaukee Business Journal’s Power Book are several Letters & Science alumni, including:

- **Daniel Bader** (‘06, honorary PhD), Bader Philanthropies Inc.
- **Danielle Bergner** (‘01, BA Economics), managing partner at Michael Best & Friedrich LLP
- **Bruce Block** (‘10, honorary PhD), Reinhart Boerner Van Deuren S.C.
- **Earl Buford** (’97, BA History), Employ Milwaukee
- **Jackie Hallberg** (‘89, Masters of Public Administration), president and CEO of Goodwill Industries of Southeastern Wisconsin
- **Tracy Johnson** (’09, BA Psychology), Commercial Association of Realtors Wisconsin
- **Gale Klappa** (’72, BA Mass Communications), interim chief executive officer and chairman, WEC Energy Group and chair of Milwaukee 7
- **Vicki Martin** (’77, BA Sociology), president of Milwaukee Area Technical College
- **Peggy Williams-Smith** (’93, BA Mass Communication), Marcus Hotels & Resorts
- **Dennis Kois** (’95, BA Museum and Exhibit Design), president of Milwaukee Public Museum
- **Joan Prince** (’99, BA), vice chancellor of UWM
- **Anne Zizzo** (’07, Masters in Human Resources and Labor Relations), president of Zizzo Group

**Phoebe Devitt** (’08, BS Biological Sciences) recently completed her residency in California and is returning to Wisconsin to becoming a family medicine doctor at Vernon Memorial Hospital in Viroqua. Her move is filling a critical need for doctors and healthcare in rural areas of the state. [http://bit.ly/2hOF66w](http://bit.ly/2hOF66w)

**Maureen Murphy** (‘89, BA Political Science; ’92, Masters of Public Administration) was appointed the new administrator for the Village of Mount Pleasant. Her appointment comes before construction of the Foxconn plant in the village. [http://bit.ly/2yAlEQy](http://bit.ly/2yAlEQy)


**Bill Schumacher** (’99, BA Political Science) was hired by W.M. Sprinkman as a regional sales manager. He has more than 30 years of sales management experience and will be working for Sprinkman in Wisconsin, managing processing customers in the upper Midwest. [http://bit.ly/2ion9LO](http://bit.ly/2ion9LO)

**Joseph Kerschner** (’87, BS Medical Science) was inducted as the Chair of the Council of Deans of the American Association of Medical Colleges in November. Dr. Kerschner is the dean of the Medical College of Wisconsin. [http://bit.ly/2hiUCr1](http://bit.ly/2hiUCr1)

Maureen Murphy (right) was appointed the new administrator for the Village of Mount Pleasant. Her appointment comes before construction of the Foxconn plant in the village. [http://bit.ly/2hOF66w](http://bit.ly/2hOF66w)

Maureen Murphy (left) was appointed the new administrator for the Village of Mount Pleasant. Her appointment comes before construction of the Foxconn plant in the village. [http://bit.ly/2hOF66w](http://bit.ly/2hOF66w)

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In the Media and Around the Community

Eighty percent of children in the Milwaukee Public School system are below proficiency in math and reading. UW-Oshkosh assistant professor of Public Administration Michael Ford (’13, PhD Urban Studies) is skeptical that the current structure of the district can improve educational standards, the Milwaukee Journal Sentinel reported. [http://bit.ly/2z50ii8](http://bit.ly/2z50ii8)

Studying languages and traveling can transform your life, as student Violetta Ramirez (Global Studies) can attest. She told the story of how a study abroad changed her outlook in the Lake County News-Sun. [http://trib.in/2iSk9u5](http://trib.in/2iSk9u5)

The vervet monkey is a natural host for simian immunodeficiency virus, a close cousin of HIV/AIDS, but vervets rarely contract simian AIDS. Trudy Turner (Anthropology) is a member of a research group who figured out why: the monkeys have certain genes that increase their tolerance for the virus, MedicalXpress reported. [http://bit.ly/2ymq86](http://bit.ly/2ymq86)


Volunteers, including student Amy Sorenson (Spanish), spent one November weekend doing yard work and home repairs for Milwaukee’s disabled and elderly citizens and were lauded in the Milwaukee Journal Sentinel. [http://bit.ly/2yaeALr](http://bit.ly/2yaeALr)


Language immersion reinforces classroom teachings from the Indian Community School of Milwaukee, Meg Noodin (English) said, especially when it comes to Indian languages like Ojibwe. Indianz.com reported on the school in November. [http://bit.ly/2yB13R4](http://bit.ly/2yB13R4)


David Hoeveler (emeritus History) presented a lecture entitled, “John Bascom and the Origins of the Wisconsin Idea” at UW-Sheboygan in November.

To celebrate the 500th anniversary of the start of the Reformation, Merry Wiesner-Hanks (History) presented a talk about the voyages of Columbus and the global changes stemming from the Reformation at Minnesota State University in November. [http://bit.ly/2zG0GEX](http://bit.ly/2zG0GEX)

Jean Creighton (Planetarium) talked with CBS58 reporters about the offerings at the Manfred Olson Planetarium in November. [http://bit.ly/2jwd1Id](http://bit.ly/2jwd1Id)

Hollywood and Capitol Hill have reacted much differently to the recent sexual assault allegations dominating headlines, Kathy Dolan (Political Science) told a reporter. The article ran in news outlets from coast to coast. ([http://bit.ly/2hp15R6](http://bit.ly/2hp15R6)) She also commented on the partisanship and hypocrisy bubbling to the surface as sexual assault allegations continue to crop up surrounding politicians. ([http://bit.ly/2zUvx0c](http://bit.ly/2zUvx0c))

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In the Media  

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Understanding the nature of science is the greatest predictor of whether or not a student accepts the theory of evolution, according to a new study conducted in part by Ben Campbell (Anthropology) and Andrew Petto (Biological Sciences), according to an article on Phys.org. [link]

What does the mating behavior of birds tell us about evolution and climate change? Peter Dunn (Biological Sciences) revealed the answers in an interview published on Phys.org. [link]

The Murchison Widefield Array Radio Telescope in Australia recently completed an expansion that will help scientists, including David Kaplan (Physics) explore and answer questions about the evolution of the universe, according to Space Daily. [link]

Student Brandon Zaboklicki (Journalism, Advertising, and Media Studies) was the creator of the controversial “Dicks out for Harambe” Internet meme. Marc Tasman (also JAMS) used it as a learning opportunity in a UWM class, reports the Milwaukee Record. [link]

Babies born in Flint, Mich. since the start of the water crisis in 2014 have lower birth weights than they likely would have had if the crisis had not occurred, according to a new study coauthored by Scott Adams (Economics), Rewired reported. [link]

It’s a hard-knock life for a lot of people right now, but singing “Tomorrow” isn’t likely to be a comfort to those in need, Joe Austin (History) said in a Wisconsin Gazette article heralding the opening of Milwaukee Skylight Music Theater’s production of Annie. [link]

The Urban Studies program’s annual Henry W. Maier State of Milwaukee Summit examined the city’s affordable housing crisis. Before the summit, two of the summit’s panel of experts discussed the topic on WUWM’s Lake Effect show. [link]

Sarah Schaefer (Art History) has curated an exhibit at Marquette University’s Haggerty Museum of Art that revolves around works featuring doomsdays and apocalypses. The exhibit, running through Jan. 14, 2018, was reviewed in the Milwaukee Journal Sentinel. [link]

Passings

A local advocate for disabled rights passed away in October. Patricia Ann “Patty” Hayes fought a degenerative neurological condition called Friedreich’s Ataxia for most of her life. Despite the challenges she faced, Patty became an outspoken leader for disabled rights in Milwaukee and championing access to appropriate technology for disabled people. She earned a Master’s degree in Philosophy from UWM in 1996. Learn more about her life at [link].

Alumni Accomplishments  

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Christopher Brey (’88, BS Zoology) delivered a talk at the invite-only Philly Phage Phestival at Drexel University in Pennsylvania. Brey is an associate professor in the science, computer science, and mathematics department at Marywood University. [link]

Chris Terry (’05, MA Journalism, Advertising, and Media Studies) is listed by the University of Minnesota as an expert available for commentary regarding the proposed AT&T and Time Warner merger and the Department of Justice’s stipulations regarding the move. [link]

Erin Grunze (’03, MA Sociology) was appointed the next executive director of the League of Women Voters of Wisconsin. She takes over the position from the previous director, Andrea Kaminski, on Jan. 1, 2018. [link]
Cancer drug synthesis

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compound you’re going to put into your round-bottom flask. It all goes into one flask where the reaction takes place. I think the longest reaction I ran was 24 hours, but some people in the lab have run reactions for multiple days.”

After the chemical reaction is complete, the students have to clean their newly-made compound to free it from impurities using column chromatography, and then test the product using nuclear magnetic resonance spectroscopy, a method to identify the components of the product of the chemical reaction to determine if the trial was successful.

It took Aleiou almost 30 trials and a whole semester to synthesize the first step, which involved coupling two compounds together. The second step, a deprotection and cyclization of the compound, went more quickly. Aleiou also managed to synthesize the third step, which is another deprotection reaction. A graduate student in Dr. Hossain’s lab is currently working on the fourth step.

“It’s very promising, but all research is uncertain,” Aleiou said. “Anything could prevent it anywhere along the way. If the fourth step doesn’t work, then we have to backtrack and see if we change, say, the first step slightly, how does that affect the fourth step?”

Synthesizing Tryprostatin is only the beginning, however. If and when Dr. Hossain and his students are able to completely reproduce this drug, they also plan to synthesize different variations of it.

“This may lead to development of different treatments of other diseases,” Aleiou said. “The drug and its different variations must still undergo clinical trials before they even think about introducing it to the market.”

But, Aleiou is hopeful. Making a more efficient, cost-effective cancer drug can only benefit cancer patients, and helping people is what drew him to Dr. Hossain’s lab and the pre-med track in the first place.

“I have health issues of my own, so if I can help prevent someone from feeling the way that I do sometimes, that would be fantastic,” he said.

Aleiou is preparing for his MCAT, the medical school entrance exam, and plans to take a gap year after graduation to do volunteer and clinical work.
The tests measure patients’ focus and timing, and can measure how quickly a patient responds to visual and sound stimuli before their treatment, compared to after treatment.

“When people come to us at the first time point, we don’t know who’s going to be in the chemobrain group and who’s going to be in the control group. We’re going to test them before we actually know who’s going to have chemobrain,” Greenberg said. “We’ll be able to correlate the data from Time Point 1 with the people who have chemobrain later at Time Point 2 and see how their data from Time Point 1 differed from people who did not have chemo-brain symptoms later.”

Using those results, Greenberg hopes that he’ll be able to make some predictions about who might be more susceptible to chemobrain and who might be more resistant, even before they begin chemotherapy. Maybe, he said, they might even be able to predict what symptoms of chemobrain a patient may develop, or how severe those symptoms might be.

This is one of the first times a study of this type has been conducted, Greenberg added.

The second part of Greenberg’s research adds another component. This time, when he administers behavioral tests before chemotherapy begins, he’ll also ask patients to sit for an MRI scan.

“We’re going to try and understand whether any of these metrics that we can find that are predictive of the symptoms or the severity of the symptoms also have a neural correlate,” Greenberg said. “Are there biological differences that we can find in someone’s brain? … Does that tell us something about whether they will be affected by the chemotherapy and what symptoms they might have?”

Mitigating Chemobrain

Though there is very little research into chemobrain, what research has been done shows that its symptoms can last for years, even after a patient is declared cancer-free. It’s a grim reminder of a traumatic disease that can affect a person’s work performance and social life, even up to five years after treatment has ended.

That’s one reason Greenberg is hopeful that his research can be used to predict who might be at risk for developing chemobrain.

“The pie-in-the-sky ideal is that we’ve collected enough data to not just better understand what chemobrain is – can we make a better definition of chemobrain for physicians to use?” he said. “The second hope is to inform the scientific and medical community about what types of patients would be more susceptible to chemobrain symptoms (so) that physicians can inform patients about the potential for these symptoms and give them an opportunity to reduce the impact of those symptoms long-term.”

That might mean that a physician can prescribe his or her patient mental exercises or brain training games to reduce the impact chemobrain might have on their short-term memory, or there might be drugs that can help a patient maintain their motor abilities.

“If we can help to make those chemobrain symptoms go away quicker or have them not be present at all, I think it will help people get back to their normal lives quicker,” Greenberg said.
Milwaukee's cancer disparities

It's hard to say because there's been very little research into these differences, which was one reason that Matabele was so eager to work with MCW.

But she had some other motivation too — interning at the Medical College has exposed her to a new and fascinating world. In addition to her cancer research, Matabele and her fellow interns were treated to hours of seminars every day covering all sorts of topics related to cancer. She accompanied physicians on their rounds to meet with patients and regularly met with other CHIP interns to talk about public health and policy.

The experience was invaluable for Matabele.

“My knowledge of cancer prior to this internship was limited, yet within two months I felt like I had a much stronger foundation. Even though cancer is a broad topic, … to learn about the cancer disparities has been really interesting,” she said. “And seeing all of these women physicians (that I worked with) has been really empowering.”

Matabele is on-track to graduate in the spring of 2018. She hopes to attend medical school to pursue a dual medical doctorate/Masters of Public Health and is thinking about entering family medicine when she becomes a physician herself. At the heart of her future plans is a desire to help the people she interacted with this summer – those whose health is most at risk.

“One of the difficult things about this internship was seeing how severe these cancer disparities are in my community and in Milwaukee. It's disheartening to see that it's mainly in urban areas. It makes you question why and what's being done as well as what's not being done,” Matabele said. “That being said, it has been tough, but it makes me more impassioned. It's my responsibility to not only recognize and evaluate these disparities, but contribute to the effort to find solutions in any way that I can.”

Protein folding

You can't see proteins. So how do you study the effect of such forces?

We've built our own instrumentation, called “single molecule magnetic tweezers,” to explore protein folding. Using magnetic tweezers, we can make a synthetic protein and then apply forces in a lab setting to test a particular physical process by tethering it between a glass surface and a para-magnetic bead. Since we can't see the molecule changing, we measure the position of a para-magnetic bead that is attached at one end, and that of a non-magnetic bead, glued to the surface. Then we apply a magnetic force and measure the unfolding and refolding of each protein.

A profound new concept that is emerging from our experiments with magnetic tweezers is that proteins under force can reverse their domains from folded to unfolded states in vivo (in the body). This continuous unfolding and refolding might have biological implications, such as signaling, storage of energy, or recruitment and release of binding partners.

Give us a specific example of how your work can inform disease.

Misfolding is when the protein tries to obtain its final 3-D structure but ends up with a different, toxic structure. Misfolding causes a chain reaction that can lead to disease. But it is a relatively rare occurrence in the body. In our lab, we can speed up the folding process and measure in one hour the same number of times misfolding happens over the span of 60 years.

Using magnetic tweezers, we have studied the mechanical response of titin, the giant protein that gives muscles their elasticity. In a recent article, we proposed a new mechanism for muscle contraction: As muscles contract and relax, the unfolding and refolding of some of titin's domains play an active role.

Understanding how certain mutations change the working range of proteins that drive contraction will help us investigate muscular dystrophy, which manifests as an increasing weakening and breakdown of skeletal muscles over time.