



Forum in Focus

SPRING 2015

President's Letter

Spring is here, and the Gala is around the corner! As this Forum year wraps up, I am astounded at how quickly it has all gone by. It has been a great year, and thanks to the hard work of the trustees much has been accomplished.

On February 5th, **Tammy Cochran** and **Tracee Feik** organized the Roundtable Discussions at the Argyle. This is one of my favorite events of the year, as it is a great opportunity to sit down with the scientists at Texas Biomed and hear about their research. This interesting and informative event really highlights the great research being done at Texas Biomed.

This Spring marked the 21st annual Science and Education Awards organized by **Sara McCamish** and **Lynnette Embrey** in conjunction with the generosity and dedication of Valerie Gunther and the V.H. McNutt Memorial Foundation. Many local high school teachers submitted their applications this year, and it is always so exciting to see the winners! Congratulations to all!

A big thank you to **Shalimar Wallis** and **Edie Wright**, Newsletter, who have worked hard all year to bring us this and other newsletters. We all enjoy reading these newsletters, as they keep us up to date on the latest news with the Forum and at Texas Biomed. We appreciate all the work!

A huge congratulations also goes out to **Amanda Bezner**, 1st VP Lecture Luncheon, and **Tracy Williams**,



Melissa Morgan

Luncheon Assistant, who put on this year's very well-attended Spring Lecture Luncheon. Dr. Anthony C. Comuzzie gave a fascinating presentation entitled "The Sweet Life: The Causes and Consequences of Diabetes." In keeping with the luncheon's topic, a very healthy and delicious lunch followed the discussion.

Christina Mayer and **Ann Walton**, Student Tours, have wrapped up this year's student tours of the Texas Biomed facility. These tours are in very high demand! I encourage everyone to become involved in next year's student tours as it is inspiring to see the enthusiasm of the students when they get an up-close look at Texas Biomed. Thank you to Christina and Ann for making these tours a continued success!

Daniela Serna, 4th VP Membership, along with **Amy Swaney**, Membership Assistant, have been working diligently throughout the year to expand our Forum membership. **Elizabeth Cox** and **Ashley Weaver**, Directory, have been working with Membership to completely overhaul this year's directory. The new and better-than-ever directory will be a great and lasting improvement for the Forum. Many thanks to everyone for all their hard work!

And it would not be May without the Gala! We are all looking forward to the upcoming 2015 Gala, "Fabulous Las Vegas." **Jordan Arriaga**, Gala Chair, **Courtney Percy**, Gala Co-Chair, and **Sara Walker**, Gala Assistant, have been hard at work all year putting together another fantastic and highly successful evening. May 2nd will be an evening to remember. Tables were sold out earlier this year than any other year! I hope to see you all there to enjoy the fantastic dinner,

The purpose of the Texas Biomedical Forum is to support the Texas Biomedical Research Institute through community relations, volunteer service and fundraising.

President's Letter

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dancing and Las Vegas entertainment! On behalf of the entire Forum, I thank you all for your hard work and dedication ensuring this year's event's success.

I can't end this letter without extending a huge thank you to both **Julie Zacher** and **Karen Lee Zachry**. They were absolutely invaluable to me as my advisors this year. They were a constant source of advice and help, and I'm still asking questions!

Also, I have to give a very special thank you to former Forum President, **Terry Gouger**, who very graciously stepped in and led this year's Nominating Committee. She and her committee helped usher in a new group of very talented women to serve as Forum Trustees for the next several years. We, as a board, are so fortunate to have such a great group of talented and hard-working women as Trustees!

I will soon hand over the gavel to **Amanda Bezner**, the incoming President. The Forum is in very good hands with Amanda. I am confident she will lead the Forum into a new and exciting year full of great accomplishments! Finally, I would like to thank you for all your support throughout the year. It has truly been a great privilege and honor to be Forum President this year.

Sincerely,



Melissa Morgan



The Big Give SA Campaign on May 5

Texas Biomed is once again participating in San Antonio's day of giving on May 5, 2015.

The Big Give San Antonio is part of a nationwide movement to capitalize on a single day of giving across the city. People from all walks of life come together online and give to a local nonprofit of their choice at a minimum of \$10.

Funds raised through The Big Give will finance a Forum research pilot study. Texas Biomed has a \$20,000 matching grant so that every dollar raised through Big Give SA will be matched up to \$20,000, providing the total funds needed to launch a Forum pilot study.

Information gained in these studies can lead to breakthroughs that help thousands. Studies like that of Dr. Ian Cheeseman, a young scientist whose pilot study has resulted in a \$1.8 million NIH grant to look at the genetics of the malaria parasite and potentially design more effective drug treatments, as malaria kills more than half-a-million people each year.

This year's theme for Texas Biomed's campaign is #DiscoverIt. Texas Biomed enhances lives through discovery, and we want to help #DiscoverIt . . . a cure for Ebolavirus disease, a better therapy for Parkinson's, a vaccine for HIV/AIDS, better treatments for diabetes and heart disease. These are just a few examples of the many things we wish to discover, and we want to #DiscoverIt for our children, for our parents and grandparents, for our friends . . . for our future.

These discoveries start with you. We challenge each of you to join us in helping #DiscoverIt. Tell us why or what you want Texas Biomed to discover and share your photos on social media. Then give your gift to Texas Biomed and challenge others to give a donation to Texas Biomed by participating in the #BigGiveSA2015 on May 5, 2015. The link to Texas Biomed's page on the Big Give SA, can be found at www.thebiggivesa.org.

Texas Biomed has provided a toolkit with example social media posts and downloadable #DiscoverIt signs that you can print and take your picture with. Click on the #DiscoverIt link for examples of #DiscoverIt reasons you can use or share with us your own reason for supporting the great scientists and the promise of Discovery at Texas Biomed.

We also encourage you to follow us on Twitter and LinkedIn, Like the Texas Biomed Founder's Council and Southwest National Primate Research Center Facebook pages.

Science Education Awards

For the past 21 years, the Texas BioMedical Forum and the V.H. McNutt Memorial Foundation have joined forces for the Science Education Awards. Local public and private high school teachers are invited to participate. The awards are given to the top six teachers whose proposals demonstrate the strongest commitment to the scientific process and the further development of progressive science education programs. The competition was incredibly intense this year as the number and caliber of applications increased dramatically.



The winners are determined by a panel of judges including Science Education Awards founder, Valerie Guenther representing the V.H. McNutt Memorial Foundation; Dr. Sara McCamish and Lynnette Embrey, representing the Forum and serving as Science Education Awards Coordinators. The panel was rounded out by TBRI scientists Dr. Jera Pecotte and Dr. Michael Owston. As always, we wish to thank Valerie Guenther of the V.H. McNutt Foundation, for her time and continued support of this program.

Annually, over \$20,000 is awarded jointly by the TBF and the V.H. McNutt Memorial Foundation. Additionally, due to a generous donation by the L. D. Ormsby Foundation the first ten teachers to submit proposals received a \$50 personal stipend. A \$200 participatory grant was also provided to

schools who did not receive a placed award. Participant grants were given to: Alamo Heights High School, Byron P. Steele II High School, Harlandale High School, KIPP University Prep, Sandra Day O'Connor and Warren High School.



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The 2015 Science Education Awards winners:

1st place

\$7000

School:

Brooks Academy of
Science and Engineering

Project Title:

Soil Phage and Pecan Tree
Diversity: Is There a Relationship?

Teacher:

Jose Ayala

2nd place

\$5000

School:

Saint Mary's Hall

Project Title:

Proteomics and Evolutionary
Relationships

Teacher:

Devon M. Lee

3rd place

\$3500

School:

Keystone School

Project Title:

Robots: They're Not Just for
Physics Anymore

Teacher:

Layne Steinhelper

4th place

\$2000

School:

KIPP University Prep

Project Title:

Infrared Spectroscopy

Teacher:

John Cordier

5th place

\$1500

School:

William J. Brennan High School

Project:

A Problem Based Learning Approach
in Teaching Medical Microbiology

Teacher:

Monica Gonzalez

Honorable Mention

\$1000

School:

McCullum High School

Project:

Water Monitoring

Teacher:

Elizabeth Perez-Gonzales

Spring Lecture Luncheon a Huge Success!

This year's Spring Lecture Luncheon and Science and Education Awards were held on March 25th at the Argyle. The luncheon was a huge success with the announcement of our Science Education Award winners, followed by an interesting lecture.

Dr. Anthony G. Comuzzie was our featured speaker, presenting "The Sweet Life; The Causes and Consequences of Diabetes". Dr. Comuzzie outlined some of the research currently underway at Texas Biomed both in regards to treating diabetic complications as well as Beta cell regeneration. He discussed how lifestyle affects our overall health and interesting genetic correlations to both.

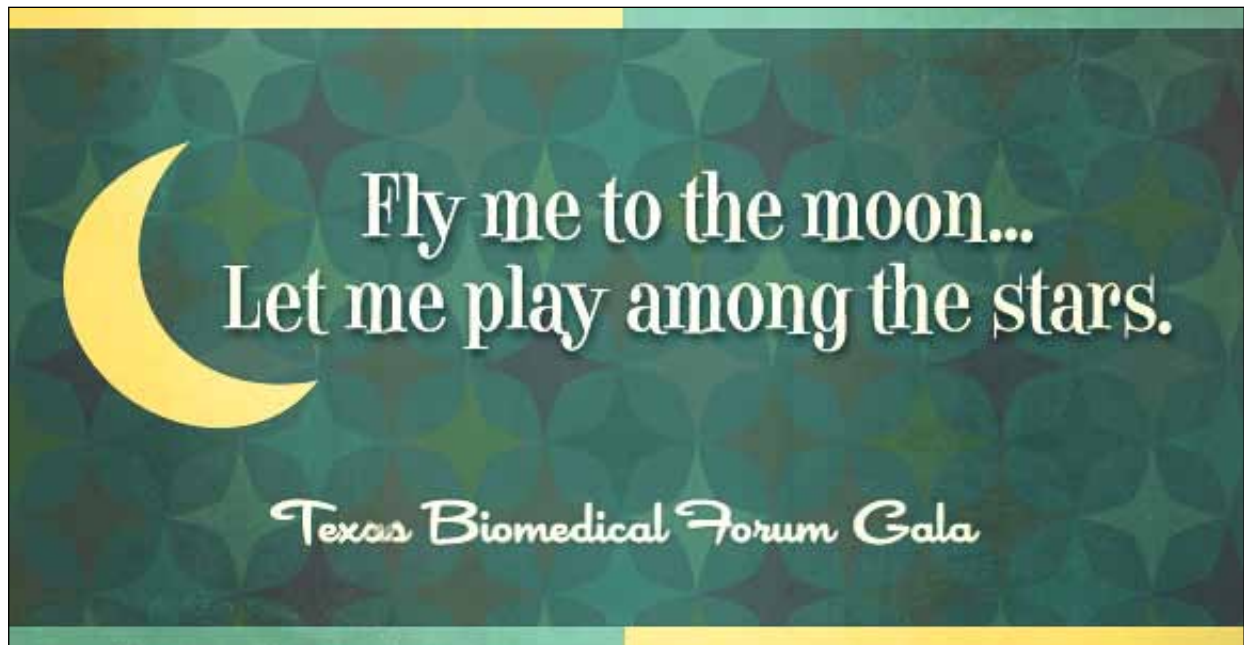
Dr. Comuzzie is a recognized authority on the study of genetics and obesity. He serves as a scientist in the Department of Genetics at Texas Biomed as

well as a Group Leader of Chronic Disease Research for the Southwest National Primate Research Center.

"While our work has clearly established a role for genes in the development of diabetes, obesity, and heart disease, it is also clear that personal behaviors such as those related to patterns of physical activity and dietary choices make a significant contribution," said Comuzzie.



during the luncheon. We are so thankful for all of our community partners.



The Texas Biomedical Forum Annual Gala will take place Saturday, May 2, 2015 from 6:00 pm until midnight at The Argyle. The theme for this year's event is "Fabulous Las Vegas", and the Gala will feature all the glitz and glam you would expect from this famous city! Tables are sold out, but the Gala's After Party starts at 9:00 p.m. and promises to impress with the famous DJ Kiss providing the night's entertainment. After Party tickets may be purchased for \$100 per ticket at <https://www.txbiomed.org/forum>.

This year, 200 raffle tickets will be sold for a 'Chance To Win' by guessing the number of sequins in a clear acrylic box. The person with the correct/exact guess will win a Lexus RC 350 as the Grand Prize, generously provided by North Park Lexus of San Antonio. The person with the closest guess to the correct/exact number of sequins in the case will win a marvelous trip to Las Vegas generously provided by MGM Resorts International and the Delano Las Vegas. The next two closest guesses will each win a "Weekend in a Lexus" from North Park Lexus of San Antonio. The correct number of sequins in the case will be revealed at the Gala at 10:00 p.m. – you could be a winner by making your best educated guess. A Premiere Silent Auction will be included with exclusive packages from The Argyle, Julian Gold, Lee Michaels Fine Jewelry, Neiman Marcus, Paloma Pachanga, Shetler Wade Jewelers and more, so come prepared to support the Forum and the Texas Biomedical Research Institute. The Annual Gala raises money to fund pilot studies at Texas Biomed so that important and necessary medical questions can be researched and the health of all human beings can be improved. We encourage your support and ask that you: donate to Forum Grants, buy a raffle ticket or bid on our Premiere Silent Auction Packages. We are looking forward to another magical evening, and remember . . . what happens at The Argyle, stays at The Argyle.

Texas Biomed Updates

LLAMA ANTIBODIES COULD HOLD KEY TO ROBUST MARBURG AND EBOLA VIRUS DIAGNOSTICS

Texas Biomed scientists receive NIH grant to study new virus detection methods

Rapidly diagnosing infectious disease is critical to limiting its spread and containing an outbreak; as the world has witnessed over the past year with the spread of Ebolavirus disease. Scientists at Texas Biomedical Research Institute in San Antonio are receiving funding from the National Institutes of Health in the form of a \$2.36 million R01 grant over the next five years to focus efforts on exploring and developing a novel mechanism of Filovirus detection – using llama antibodies.

Perhaps the most sensitive diagnostic tool currently available is to specifically test for the genome (DNA or RNA) of a virus using PCR methods. Later on during infection, another tool is to look for specific antibodies produced by the host in response to that virus. However, scientists in the lab of Dr. Andrew Hayhurst at Texas Biomed are exploring the potential of detecting specific building blocks of virus particles – polymeric proteins.



DR. ANDREW HAYHURST

“Detecting single viral protein components can be challenging, especially at very low levels; however, most viruses are repetitive assemblies of a few components, with some existing as polymers of several thousand copies, which present great targets for our llama antibodies,” Hayhurst explained.

He described the process similar to that of microscopic Velcro hooks; whereby, one hook is the viral protein and the other is the llama antibody.

“If you consider one viral protein binding to one llama antibody the interaction can be relatively modest, but if you consider thousands of pairs of hooks

as occurs in sheets of Velcro, the interaction between the two becomes much more powerful,” Hayhurst explained. “A more powerful interaction leads to a more sensitive diagnostic.”

Seeking to understand the mechanism of the interaction between llama antibody and virus protein, Hayhurst collaborates with Drs. Alex Taylor and John Hart of the UT Health Science Center X-ray crystallography core lab. Here, the atoms comprising the interface between antibody and virus protein can be revealed, giving clues to how and exactly where the llama antibodies bind.

“We’ve had these beautiful structures for quite a while now generated with the help of former lab member Dr. John Garza, but I only appreciated the significance of them more recently when pondering viral evolution,” Hayhurst said. “Examining all the strains of Marburg virus that have emerged since 1967, we can graft predicted mutations onto our crystal structures to indicate that our antibodies bind a highly conserved structure that has never changed.”

RNA viruses like Marburg and Ebola (and others like influenza) are prone to mutate and evolve which can make them undetectable if care is not taken to ensure the PCR test or antibody based test can detect the latest strains. The anti-Marburg llama antibodies studied so far do not appear to suffer from this vulnerability as they target a region of the virus that has so far shown no capacity to mutate.

“Our aim is to develop these llama antibodies into streamlined tests designed to detect all Marburg and Ebola strains known and potentially those yet to emerge,” Hayhurst said. “Our goal is to help to safeguard human health both now and into the future.”

Hayhurst points out that the llama antibody tests do not match the sensitivity of current qRT-PCR tests;

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however, one of the goals of this current study is to engineer improved tests.

“Pioneering simple, fast and inexpensive llama antibody based Filoviral immunoassays that match qRT-PCR sensitivity and specificity, will help safeguard human health by providing a comprehensive diagnostic toolkit for outbreak settings,” Hayhurst said.

The United Nations just this week continued its call for vigilance to the threat posed by Ebolavirus disease, as more

than 24,000 people have been infected with the virus since late 2013 and more than 10,000 people have died in the latest outbreak.

This study, titled “Mechanism and Evolution of Filoviral Monoclonal Affinity Reagent Sandwich Assays,” is being funded by an RO1 grant from the National Institutes of Health National Institute of Allergy and Infectious Diseases. The award is for a \$470,814 grant each year for five years.

Southwest National Primate Research Center Receives Full Accreditation from International Laboratory Animal Care Assn.

The Southwest National Primate Research Center (SNPRC) at Texas Biomedical Research Institute has received a continuation of its full accreditation from the Council on Accreditation of the Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC International).

AAALAC is a nonprofit organization that inspects and assesses the work of research programs involving animals to ensure that the organization not only meets minimum regulatory requirement but goes above and beyond in the care and use of animals.



“We are very proud to receive full accreditation status, as it speaks to the dedication and commitment our staff has toward the care of animals at the SNPRC,” said Dr. John Bernal, Associate Director of Veterinary Resources and Attending Veterinarian for the SNPRC. “AAALAC accreditation is a voluntary process by which our program and our staff undergo intense scrutiny, but we see it as a critical part of our assessment program. In addition to the standard monitoring by regulatory agencies, AAALAC helps us ensure we are doing everything we can to maintain the safety and high quality of care for the animals at SNPRC.”

According to the AAALAC accreditation letter, the Council noted several areas of excellence, including the baboon social housing that includes environmental enrichment, the comprehensive computerized animal database medical record program and the behavioral management program for all of the species at the SNPRC, as well as several other observational and reporting procedures in place at the SNPRC.

“Working in the animal research industry requires a great deal of care and compassion,” said Dr. Robert Lanford, Director of the SNPRC. “Our team understands that it is imperative our animals have the highest level of care, as they contribute to the scientific research being done here that is so critical to the advancement of human health and fighting disease.”

EBOLA VIRUS RESEARCH AT TEXAS BIOMED PUBLISHED IN SCIENCE MAGAZINE

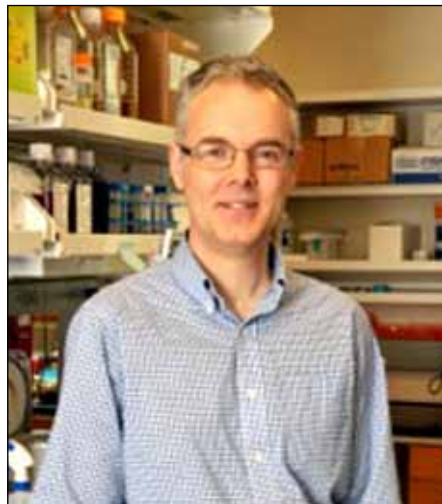
New research that focuses on the mechanism by which Ebola virus infects a cell and the discovery of a promising drug therapy candidate was published February 27, 2015, in the journal Science. Dr. Robert Davey, scientist and Ewing Halsell Scholar in the Department of Immunology and Virology at Texas Biomedical Research Institute announced found that a small molecule called Tetrandrine derived from an Asian herb has shown to be a potent small molecule inhibiting infection of human white blood cells in vitro or petri dish experiments and prevented Ebola virus disease in mice.

The latest outbreak of Ebola virus disease has caused the death of more than 10,000 people worldwide and continues to infect thousands in West Africa.

Ebola virus causes hemorrhagic fever in humans and currently has no approved therapy or vaccine. Scientists at Texas Biomed have been working in the Institute's Biosafety Level 4 containment laboratory for more than 10 years to find a vaccine, therapies and detection methods for the virus.

Davey and his team have been working for more than five years on identifying and finding therapy targets for Ebola virus disease. Davey's research has focused on stopping the virus before it has a chance to enter or interact with cellular factors, as that is a critical first step to combatting infection.

Ebola virus begins its entry into a cell by first binding to several types of cell surface proteins. Then the virus is taken into the cell and follows an endosomal route, or membrane-bound route



DR. ROBERT DAVEY

that transports the virus to various cell compartments.

From previous studies, Davey said that during this process, he knew that calcium signaling in cells, which allow cells to transmit electrical charges to one another, controls many of the processes in the cell and was important for Ebola virus infection.

"We were not able, however, to pinpoint the mechanisms involved in this process," Davey explained. "With this research, we discovered that two pore channels (TPCs) are the key calcium sensor

involved in Ebola virus infection. These TPCs essentially need to be turned on in order for the virus to function properly."

Two pore channels are unusual calcium channels found in endosomes that control the way endosomes move through cells and the environment of the cells. Davey compared TPCs to traffic cops and air conditioners, helping direct the endosomes and any virus it might be carrying through the cell and making the endosomes and its passengers more comfortable along the way.

Davey and his team were able to show the critical role of two pore channels in Ebola virus infection, which has not previously been shown in any other virus.

In addition to identifying this critical mechanism to infection, Davey's team also showed that drugs targeting this interaction show some efficacy as potential treatments against Ebola virus disease.

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Biomed Updates

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In the study, Davey's team determined that existing drugs currently used to treat high blood pressure have an ability to turn this key calcium sensor on and off. Working with a group in Munich, Germany and Southwest Research Institute, the team tested several small molecules to see which was most effective at turning the sensors off thus prohibiting Ebola virus from moving any further through the cell.

The team found Tetrandrine protected mice from disease without obvious side effects and was the best candidate for further animal testing, because it was the most potent compound tested, gave little evidence of cytotoxicity and required a smaller dose to be effective and tolerated.

"When we tested in mice, the drugs stopped virus replication

and saved most of them from disease," Davey said.

Essentially, this drug shows an ability to stop the virus before it has a chance interact with cellular factors, thus stopping the virus from continuing its infection process.

"We are very excited about the progress made in this study and the momentum it provides as scientists across the world vigorously search for effective vaccines and treatments against Ebola virus," Davey said. "We are cautiously optimistic. The next step in the process is to test both safety and effectiveness of the interaction of the drug with Ebola virus in non-human primates."

Collaborators and Co-authors on the Science paper include

Andrey Kolokoltsov at the University of Texas Medical Branch at Galveston. A team at the Center for Integrated Protein Science Munich (CIPSM) at the Department of Pharmacy – Center for Drug Research at Ludwig-Maximilians-Universität München in Munich, Germany did special cell analysis. That team includes Cheng-Chang Chen, Christian Grimm, Christian Wahl-Schott and Martin Biel. Also contributing is Norbert Klugbauer who previously worked with two pore channels at the Institute for Experimental and Clinical Pharmacology and Toxicology at Albert-Ludwigs-Universität Freiburg in Freiburg, Germany. And, Michael Tidwell and William Bauta performed chemical synthesis at the Southwest Research Institute in San Antonio, Texas.

Forum Membership Dues Moving On Up!

After careful consideration, the Texas Biomedical Forum Board Members voted and approved an increase in the Forum membership dues effective June 1, 2015. It's been awhile since these dues have been increased and it was apparent that in order to keep up with the costs of printing, mailing and maintenance of our online communications this was needed. Currently, the dues structure is as follows: Standard – \$35, Patron – \$50, Benefactor – \$100. Starting this June, the dues structure will be: **Standard – \$50, Patron – \$100, Benefactor – \$250.**

We have a rolling membership, which means that women (21 years of age and older) can join anytime during the year. However, our membership year begins

June 1st and the cutoff date to be included in the printed directory is September 1st.

The benefits of membership include: a tour of the Texas Biomedical Research Institute, a hard copy newsletter three times a year, invitations to two lecture luncheons and the premier spring fundraiser annual Gala each year at The Argyle, as well as a complimentary membership directory. We are constantly recruiting members and invite everyone to tell their friends about the Forum and its great work to support Texas Biomed.

We hope that all Forum members, past and current, will renew their membership again this Spring.

Stay tuned for your membership renewal reminder!



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