

# CROSSROADS

THE OFFICIAL NEWSLETTER OF THE PREMED SCENE



## ***RISING STARS IN MEDICINE: Dr. Huda Y. Zoghbi***

### **Dear medical newsletter readers,**

Happy August! Today, we bring to you the most recent news in medical research! Rameesha Mustafa is your next Rising Stars in Medicine writer, talking about Dr. Huda Y. Zoghbi and their work in research regarding Rett Syndrome. Then, Siri Nikku focuses on how healthcare providers view disparities in human health. Next, Ilana Saidov spreads greater awareness regarding nanovesicles in treating cancer. Finally, Mahima Bhat talks about sustainable healthcare.

This will be my last medical newsletter as The Premed Scene's Newsletter Director! It has been a joy working with an exceptional group of blog writer interns and helping bring the latest research in the medical field to you. Please enjoy reading The Premed Scene's August 2023 Medical Newsletter!

*Aprile Bertano*



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# Rising Stars in Medicine: Huda Y. Zoghbi

**BY RAMEESHA MUSTAFA**

In the realm of modern medicine, Dr. Zoghbi has made a profound impact. In fact, she has won various awards, such as the prestigious Breakthrough Prize in Life Sciences, for her groundbreaking work in genetics and neurology research. Her discoveries have unraveled the mysteries of many devastating neurological disorders. With that new understanding, we are advancing as a society to understand and counter these diseases. Her contributions have solidified her status as a true luminary and a beacon of inspiration for future generations of medical researchers.

From a young age, Dr. Zoghbi was driven by her curiosity and was fascinated by the human brain. She pursued her undergraduate studies in biology at the American University of Beirut, where she excelled and displayed a remarkable aptitude for research. Following her undergraduate studies, she moved to the United States to further her studies. She received her M.D. from Meharry Medical College in Nashville, Tennessee, and subsequently completed her residency in pediatrics at Baylor College of Medicine in Houston, Texas. During her Residency, she was captivated by neuroscience research, which then developed into her career. One of her most notable accomplishments is uncovering the genetic basis of Rett syndrome, which provided a diagnosis and opened avenues for treatment development. Moreover, her discoveries of genes directly related to spinocerebellar ataxias (SCAs) helped pivot our understanding of many neurological disorders. So her crucible contribution to medicine has helped strengthen our understanding of many neurological diseases. Her legacy will shine bright and continue to inspire future scientists to continue pioneering the various complex and interconnected fields of science and medicine.

# Health Providers Knowledge of LGBTQ+ Patient Disparities

BY SIRI NIKKU

A study was done recently on integrative health providers being aware of LGBTQ+ health disparities compared to cisgender and heterosexuals. Many of the integrative health providers included chiropractors, naturopaths, acupuncturists, and massage therapists. The study also focused on how the providers knew of the specific health concerns for specific populations of the LGBTQ+ community. The method for this study was an electronic survey that consisted of demographic questions, close-ended, and questions about whether providers knew of LGBTQ+ health inequities. There were also more specific tests called Kruskal-Wallis H tests that were like comparisons utilized to determine any differences between the various health providers and their awareness of health inequalities for both LGBTQ+ adults and youth. There was a focus on also the types of training health providers got for LGBTQ+ health. Results for the study included several providers knowing about transgender health issues; this could be due to more trans media being more prevalent.



Some of the other results of the survey indicated that majority of the health providers knew that LGBTQ+ youth and adults were affected more by bullying and other forms of discrimination. However, many of the health providers did not know that substance abuse and suicide rates are more common for queer individuals. There was also very little competent LGBTQ+ training for health providers, leading to the lack of knowledge of the issues queer individuals faced. Providers who were queer themselves but didn't have training were often able to better treat queer patients compared to cis het providers who had training. There needs to be better training than just lived experienced for providers who are not queer to ensure quality healthcare for LGBTQ+ people.

References

<https://meridian.allenpress.com/jce/article/doi/10.7899/JCE-22-2/494326>

# The Efficiency of Nanovesicles in Cancer Treatments

BY ILANA SAIDOV

Researchers at Binghamton University created genetically engineered vesicles, called nanovesicles, to increase the efficiency of cancer treatments. These nanovesicles can be bioengineered to deliver cancer treatments and directly target cancer cells.

Currently, cancer is being primarily treated with chemotherapy. While this approach is standard, we should remember that chemotherapy has negative factors. First, this type of treatment targets and harms healthy cells, not only cancerous cells. In addition to harming the cells, many therapeutic targets stay within cancer cells, making them more challenging to reach. Due to these aspects, researchers were determined to create a method of treating cancer without severely harming the patient's healthy cells. To achieve an accurate and efficient approach, the biomedical engineers researched cell-derived nanovesicles that would deliver therapeutic agents to the inside portion of cancer cells. The small sack-like structures can further be modified to carry medications. According to Professor Yuan Wan of Thomas J. Watson College of Engineering and Applied Science, the nanovesicles can be "harvested from human cell strains, so the immune response is very low. That allows for optimal biocompatibility, so they evade immune clearance and have an extended blood half-life."



The nanovesicles can be loaded with a drug and safely taken up by cancer cells. Once the cancer cells take the medication the nanovesicle carries, the high drug concentration in the tumor microenvironment will kill the cancer cells. This process is unlike free drugs, which diffuse quickly and are cleaned from the body. Without nanovesicles, only a small amount of the drug will reach and target the tumor.

This method is currently being tested in large animal models. The current results from the study have shown that it is unnecessary to have a large amount of nanovesicles due to the membrane fusion function. By lowering the number of vesicles and drugs, the total cost and possible side effects also become lower.

Source:

Binghamton University. "Genetically engineered vesicles target cancer cells more effectively: Drugs, other treatments can be delivered directly to malignant tumors." ScienceDaily. ScienceDaily, 15 August 2023.

[www.sciencedaily.com/releases/2023/08/230815131506.htm](http://www.sciencedaily.com/releases/2023/08/230815131506.htm).



# Sustainable Healthcare through One Health

BY MAHIMA BHAT

The One Health initiative emerged as a response to the recognition of the intricate interconnectedness between human health, animal health, and the environment. It encompasses a holistic approach that acknowledges the interdependence of these three domains and seeks to improve healthcare practices by addressing health challenges through collaborative, interdisciplinary efforts. This approach has allowed us to address complex issues such as emerging infectious diseases, antibiotic resistance, and zoonotic infections more effectively.

One noteworthy initiative includes the Global Health Security Agenda (GHSA), a partnership dedicated to enhancing countries' abilities to detect, prevent, and respond to infectious disease threats, with a particular emphasis on zoonotic diseases. Additionally, the PREDICT Project, led by the United States Agency for International Development (USAID), sought to identify and characterize potentially spillover-prone viruses from wildlife to humans, contributing to preparedness and response strategies. The establishment of World Health Organization (WHO) Collaborating Centers for One Health has facilitated research, capacity-building, and policy development, aiming to reinforce the implementation of the One Health approach.

One Health has spurred initiatives for responsible antibiotic use in animal agriculture, reducing the emergence of antibiotic-resistant strains that can harm both animals and humans.

Through initiatives like the Global Health Security Agenda (GHSA) and the PREDICT Project, One Health has bolstered global health security by enhancing the capacity to identify potential pandemic threats and facilitating preparedness efforts. These practices not only promote the well-being of animals but also contribute to the preservation of ecosystems.

Recognizing how environmental changes impact disease dynamics, One Health underscores preserving biodiversity and balanced ecosystems to prevent outbreaks.

Sources:

<https://www.who.int/teams/one-health-initiative>

<https://www.cdc.gov/onehealth/basics/index.html>

