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Scientists Identify New Blood Group After a 50-Year Mystery *Unlocking the Complexities of Human Biology*

Assignment Summary:

After 50 years of research, scientists have identified a new blood group system called MAL. This discovery began in 1972 when a pregnant woman's blood lacked the AnWj antigen, which is present in over 99.9% of people. The rare blood type was linked to mutations in the MAL gene, which plays a critical role in cell function. This discovery is a breakthrough in understanding rare blood types and improving medical care for patients with unique genetic conditions.

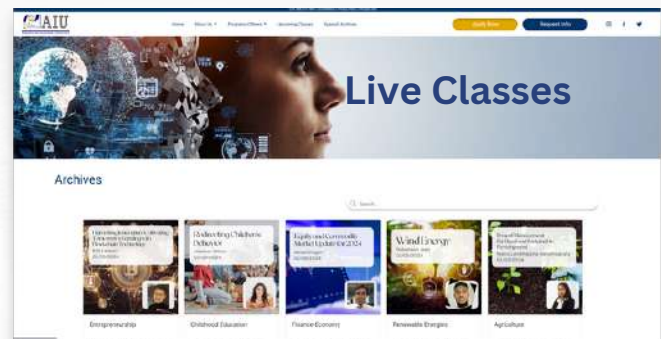
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Scientists Identify New Blood Group After a 50-Year Mystery

Unlocking the Complexities of Human Biology

In 1972, a routine blood test from a pregnant woman revealed something that puzzled doctors for decades. Her blood lacked a surface molecule found in every other known red blood cell at the time. Fast forward 50 years, and after extensive research, scientists from the UK and Israel have finally identified a new blood group system in humans. This discovery, a testament to the perseverance and collaboration of researchers, adds yet another piece to the complex puzzle of human biology.

This article explores the significance of this breakthrough, the science behind blood groups, and how such discoveries can save lives by improving medical care for rare blood disorders. Understanding these complexities not only advances science but opens doors for medical innovations that could one day benefit each of us.



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What are blood group systems?

We are most familiar with the ABO blood group system and the Rhesus factor (the "+" or "-" after your blood type). However, there are actually many different blood group systems in humans. These systems are based on various proteins and sugars that coat the surface of red blood cells.

ABO BLOOD GROUP SYSTEM

BLOOD GROUP	A	B	AB	O
RED BLOOD CELL TYPE				
ANTIGENES IN RED BLOOD CELLS	 A ANTIGEN	 B ANTIGEN	 A AND B ANTIGEN	NONE
ANTIBODIES IN PLASMA	 ANTI-B	 ANTI-A	NONE	  ANTI-B ANTI-A

Antibodies in our blood plasma detect when a foreign antigen marker is present.
(Tasha Vector/iStock/Getty Images)

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These surface molecules, known as antigens, serve as identification markers that help the body distinguish its own cells from foreign invaders. This is crucial in the immune response. If you receive a blood transfusion from someone whose antigens do not match your own, your immune system may recognize these foreign antigens as a threat and attack the transfused blood. This can result in a severe and potentially life-threatening reaction.

Most of the major blood group systems were discovered in the early 20th century. Over time, scientists have identified more systems, some of which affect only a small percentage of the population. The newly discovered MAL blood group falls into this category. Although rare, these blood types can have serious implications for medical care, especially when it comes to transfusions and pregnancies.

The 50-year search for the MAL Blood Group

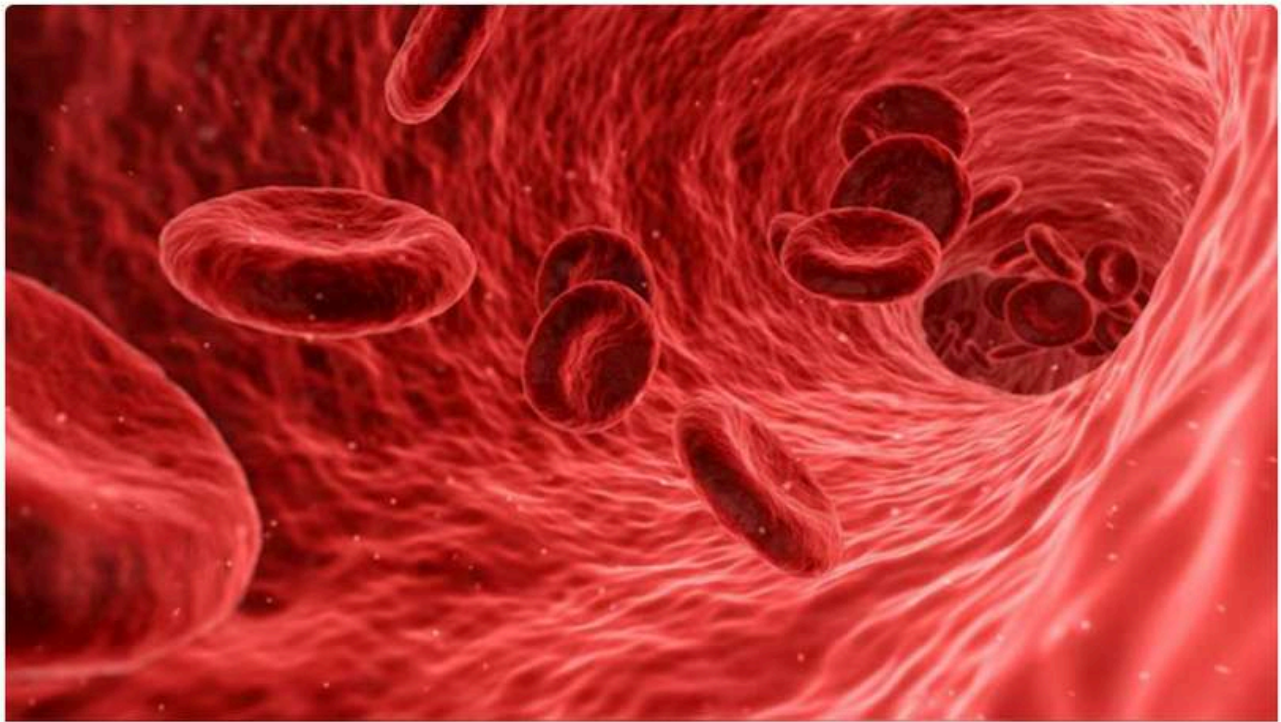
The discovery of the MAL blood group began in 1972 when a pregnant woman's blood test revealed that her red blood cells lacked a specific surface antigen, later identified as AnWj. At that time, it was a mystery as to why her blood lacked this molecule. Over the next few decades, researchers worked to understand the significance of this anomaly, leading to the eventual identification of the MAL blood group.

More than 99.9% of people have the AnWj antigen, which resides on a specific protein known as myelin and lymphocyte protein (MAL). However, individuals with mutations in both copies of the MAL gene lack this antigen, resulting in the AnWj-negative blood type. This means they belong to the rare MAL blood group. Only a handful of such cases have been identified globally, making the research process long and challenging.

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What makes the MAL protein particularly interesting is its role in stabilizing cell membranes and aiding in cellular transport. The discovery of this new blood group adds to our understanding of how critical this protein is, not only for maintaining healthy cells, but also for recognizing rare genetic mutations that can affect an individual's blood type.



The AnWj antigen – an antigen is a surface marker - was discovered in 1972 but its genetic background was unknown until now. Representational Image/Pixabay

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The process behind the discovery

The research team, led by UK National Health Service hematologist Louise Tilley and University of the West of England cell biologist Tim Satchwell, spent nearly 20 years working on this problem. Their goal was to confirm that the MAL gene was responsible for the AnWj-negative blood type.



Louise Tilley has been working on the project for 20 years

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To do so, they introduced the normal MAL gene into blood cells that lacked the AnWj antigen. As expected, the AnWj antigen appeared in the modified cells, proving that the MAL gene was directly responsible for producing this antigen. This success marked the end of a 50-year mystery and established the MAL blood group as an official system in human biology.

Interestingly, newborns do not have the AnWj antigen at birth—it develops soon after. This discovery shows how our understanding of blood groups continues to evolve, providing insights into both genetics and human development.

Why does this matter?

Blood transfusions save lives every day, but they must be carefully matched to avoid harmful immune reactions. Discovering rare blood group systems, like the MAL blood group, allows doctors to provide better care for patients with uncommon blood types. Knowing a patient's blood type in detail ensures that they receive safe transfusions and avoid dangerous reactions.

Moreover, rare blood types can indicate underlying medical conditions. For instance, the absence of the AnWj antigen could be due to a genetic mutation or a suppression of the antigen, which might point to other health issues. Testing for these rare blood groups can help doctors identify and treat hidden medical conditions.

This discovery emphasizes the importance of understanding the full spectrum of blood group systems, especially for patients who have rare genetic conditions. By advancing our knowledge of human biology, scientists can improve medical care for patients worldwide.

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What comes next?

The identification of the MAL blood group is a reminder that scientific discovery is a continuous process. With the rapid advancement of genetic technology, we are now able to identify even the rarest blood groups. This helps doctors provide personalized care for patients with uncommon blood types and improves outcomes in both routine and emergency medical procedures.

For students and professionals interested in the field of genetics, hematology, or medical research, this discovery underscores the critical role of research in advancing healthcare. Such breakthroughs remind us that persistence in scientific investigation leads to solutions that can impact lives globally.

The power of knowledge

The discovery of the MAL blood group system after decades of research highlights the importance of scientific persistence and collaboration. Understanding these rare blood types not only broadens our knowledge of human biology but directly influences the quality of medical care for patients with unique genetic traits.

At Atlantic International University (AIU), we encourage students to delve into such topics to understand the broader impact of science on society. If you are interested in pursuing a career in medical research, genetics, or biological sciences, [AIU offers programs](#) designed to empower you with the knowledge and skills needed to contribute to groundbreaking discoveries.

Start your journey today by exploring our programs in biology, genetics, and health sciences to deepen your understanding and make a difference in the world.

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Also, you can learn more about this topic in AIU's, wide range of recorded classes that cover various subjects of interest and that can be very useful to expand your knowledge. If this topic interests you, you can explore related live classes. Our extensive online library is also home to a wealth of knowledge, comprised of miles of e-books, serving as a valuable supplemental resource.

Below we share a series of resources that will help you expand your knowledge on this topic:

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What Is an Antibody?

Discovery Points to a Crucial Role Red Blood Cells Play in Our Immune Systems

Transfusion Reactions

Deletions in the MAL gene result in loss of Mal protein, defining the rare inherited AnWj-negative blood group phenotype

Scientists find new blood group after 50-year mystery

Blood Types and Titers: Saving Lives on the Battlefield with Blood Far Forward.

Non-O ABO blood group genotypes differ in their associations with Plasmodium falciparum rosetting and severe malaria.

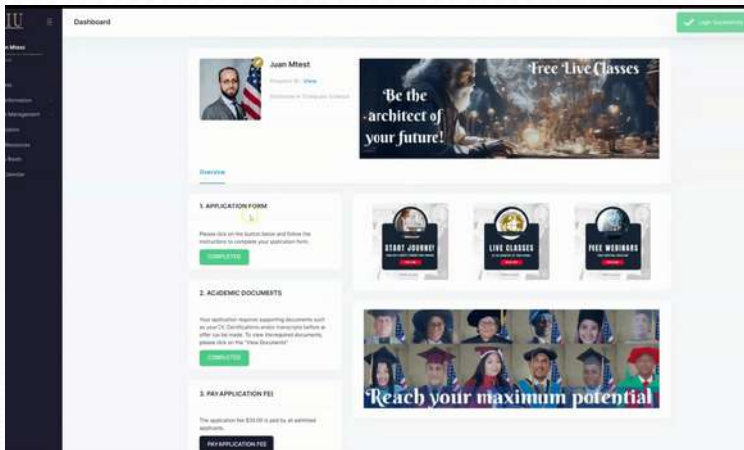
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