CRIB BLOOD GROUP: SCIENCE & TECHNOLOGY

NEWS: Kolar woman has blood group never seen before anywhere in world

WHAT'S IN THE NEWS?

A 38-year-old woman from Kolar has been identified with a globally unique blood group, named **CRIB**, marking a significant advancement in transfusion medicine. This rare antigen within the **Cromer blood group system** was validated internationally and highlights the need for a **rare blood donor registry** in India.

CRIB Blood Group Discovery

- **Discovery Location:** Rotary Bangalore TTK Blood Centre, Karnataka.
- **Patient Profile:** 38-year-old woman from Kolar, India.
- **Uniqueness:** Her blood was *panreactive* — reacted against all tested donor samples, indicating a previously unclassified antigen.
- **Global Recognition:** Validated after 10 months of antigen and genetic analysis by the **International Blood Group Reference Laboratory (IBGRL), UK**.
- **Official Naming:** Named **CRIB** –
    - **CR** from *Cromer blood group system*,
    - **IB** from *India, Bengaluru*.
    - Declared at the **35th ISBT Congress (Milan, 2025)**.

About the International Society of Blood Transfusion (ISBT)

- **Founded:** 1935.
- **Headquarters:** Amsterdam, Netherlands.
- **Role:** A global scientific society enhancing the safety, ethics, and quality of blood transfusion practices.
- **Affiliation with WHO:** Functions as a **Non-State Actor** in official relations.
- **Key Functions:**
    - Issues the **ISBT Code of Ethics** for donor and patient safety.
    - Organizes **congresses, webinars, workshops, and journal clubs**.
- **ISBT Congress 2025 Theme:** *"Innovations in Rare Blood and Transfusion Safety."*

Cromer Blood Group System – Background

- **Molecular Basis:** Antigens present on **Decay-Accelerating Factor (DAF or CD55)** protein on red blood cells.
- **Common Antigen:** *Cromer (Cr^a)*.
- **Total Known Antigens (before CRIB):** More than 20.
- **Significance of CRIB:** First-ever new antigen identified in this system in India; adds to the global antigen library.

What is a Blood Group?

- **Definition:** A classification based on specific surface antigens on **red blood cells (RBCs)**.
- **Components:**
    - **Antigens:** Molecules (proteins/sugars) triggering immune responses.
    - **Antibodies:** Immune system proteins targeting foreign antigens.

Blood Group	RBC Antigens	Plasma Antibodies
A	A	Anti-B
B	B	Anti-A
AB	A and B	None
O	None	Anti-A and Anti-B
Rh+	D antigen	None against D
Rh–	No D antigen	Can develop Anti-D

What are Rare Blood Groups?

- **Definition:** Blood groups that lack **"high-frequency antigens"** found in most populations.
- **Prevalence Classification:**
    - **Less Rare:** 1–2% of population.
    - **Very Rare:** <1%, missing multiple common antigens.
- **Complication:** Difficulty in finding compatible donors due to formation of antibodies against common antigens.

Examples of Rare Blood Groups in India and Globally

Rare Blood Type	Feature	Region
Rh Null	Lacks all Rh antigens; also called *Golden Blood*	Extremely rare worldwide

Rare Blood Type	Feature	Region
D– – (D Double Negative)	Lacks D, C, E antigens of Rh system	Very rare
In b Negative	Absence of Indian system antigen	Rare in India
Gwada Negative	Found in Guadeloupe; newly identified	Caribbean
Bombay Blood Group (hh)	Lacks H antigen present in A, B, O groups	Prevalent in Mumbai, India
CRIB	New Cromer antigen from India	First case from Kolar, India

Need for Rare Blood Donor Registry in India

- **Challenge:** Rare blood group patients often form **alloantibodies** (against missing antigens), complicating transfusions.
- **2024 Initiative:** Rotary Bangalore TTK Blood Centre launched a **Rare Blood Donor Programme**.
    - Screened 2,108 O-group donors; found 21 with rare blood types.
    - Collaborating with **e-Rakt Kosh** to build a centralized national database.
- **Proposed Solutions for Management:**
    - **Autologous Transfusion:** Collecting and storing the patient's own blood for later use.
    - **Iron Supplementation:** To reduce transfusion needs in rare group patients.
    - **Advanced Typing & Genetic Testing:** For better matching and identification.

Significance of CRIB Blood Group Discovery

- First such blood group identified from India, contributing to global transfusion science.
- Reinforces the **need for national and global rare donor registries**.
- Enhances understanding of **antigenic diversity** in Indian populations.
- Opens doors for **personalised transfusion strategies and research**.

Source: https://www.newindianexpress.com/states/karnataka/2025/Jul/30/kolar-woman-has-blood-group-never-seen-before-anywhere-in-world