

ABO system (English)

náhled|200px|Structure of antigens of each blood group of The ABO system. **ABO blood group system** involves 4 blood groups – A, B, AB, 0 according to the presence of antigens **A, B a H (0)**, these are called **agglutinogens**.

Antigens

Antigens of the ABO system are **glycolipids**, short oligosaccharides attached to an outer lipid molecule in the plasma membrane **erythrocytes**. Molecules A, B a H differ only in the last sugar residue.

- **A**: N-acetyl-galactosamine,
- **B**: galactose,
- **H**: -.

The last sugar residues are responsible for the molecules being recognized as three different antigens.

Interplay of several genes is required for the expression of ABO system antigens:

- **Main locus ABO**: 9. chromosome;
- **H-locus**: 19. chromosome.

The expression of several enzymes is involved in the formation of individual antigens (fucosyltransferase, A transferase, B transferase). Their different combinations lead to the formation of 4 possible groups: **A, B, AB or O(H)**. When two recessive genes (*hh*) for fucosyltransferase are combined, the other two enzymes cannot be used and a so-called **phenotype Bombay** is formed. Erythrocytes **do not express agglutinogens A nor do they express B**, even though the enzymes for their formation are present in the genome of this individual. Typing of ABO antigens is essential for blood transfusion, tissue and organ transplants, paternity testing (inaccurate and only tentative).

Iron

Antibodies

náhled|200px|Chart of antigens and antibodies for each blood group of The ABO system. The presence of IgM and IgG antibodies in the serum is characteristic. They are called **agglutinogens**. These antibodies are always designed to interact with antigens of the ABO system, which are not **present in the blood of their bearer** .

Individuals with Bombay phenotype correspond to the group 0 with antibodies anti-A, anti-B, and even **anti-H**.

Distribution

Groups **A a B** make up to 11 subtypes, which differ in the number of antigenic structures on erythrocyte membrane. The most common are A1, A2. Individuals with **Bombay phenotype** occur very rarely.

Distribution of blood types in Europe is approximately:

- **A**: 45 %
- **B**: 16 %
- **AB**: 6 %
- **O**: 33 %

Representation in other parts of the world **varies significantly**.

References

Related articles

- Krevní skupiny
- Rh systém
- Dědičnost krevních skupin
- Imunopatologická reakce II. typu
- Transfúze
- Inkompatibilita ABO při transfuzi

Source

▪

