

BLOOD GROUP KINGDOM

The laboratory's most wanted



ABO

ABO is the King of all blood groups and leader of the Blood Group Kingdom. Rh tries to claim the leader position but the crown belongs to ABO. It is the oldest of all blood groups that was discovered and reigns over transfusion reactions. King ABO is the first blood group to develop and is powerful and destructive because it is everywhere. If you are looking for ABO antibodies, be sure to check colder weather, they do not like warmer climates. Also, this King can be tricky...don't be fooled if you don't see its antigens, its antibodies will most certainly be there.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
A	43%	27%	27%	21%	28%	39%	34%
B	9%	20%	16%	40%	29%	22%	14%
AB	4%	4%	4%	9%	9%	10%	3%
O	44%	49%	54%	29%	34%	29%	49%
Comment	In some South American Indian groups 100% are O						



Lewis

Lewis tries very hard to be "one of the gang", but really isn't a blood system at all. Any old mucus cell can create Lewis antigens, even the salivary gland. They hang out on red blood cells, trying to look tough, but no one really pays much attention. Lewis antibodies are quite common but most are IgM, so they cause few problems in transfusion or pregnancy.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
Le ^a	LE1	22%	23%	19%	21%	24%	19%
Le ^b	LE2	72%	55%	72%	61%	77%	65%



Duffy

The party animal of the blood systems, Duffy antibodies like company, they can often be found mixing sociably with other antibodies. Something of a snob, Duffy prefers American or European hosts. It almost never visits Africa, but that's good - lacking Duffy antigens can make people more resistant to certain Plasmodia invasions.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
Fy ^a	FY1	66%	10%	36%	87%	>99%	39%
Fy ^b	FY2	83%	23%	40%	58%	9%	18%



Kell

The meanest, nastiest blood system around is undeniably Kell. Second only after Rh, Kell is 20 times more immunogenic than any other blood group antigen (with the exception of RhD). Researchers at the Mayo Clinic accuse Kell of causing 21 percent of hemolytic transfusion reactions during a ten year study. With a record like that, Kell is one to be watched.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
K	KEL1	9%	2%	20%	4%	<0.1%	<0.1%
k	KEL2	>99%	>99%	99%	>99.9%	>99%	>99%

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The antigen frequencies cited in this poster have been gathered from the references listed above. If you have any studies or documentation that support antigen frequencies where data is missing, please contact your local Werfen Representative with that information for inclusion in a future revision. We appreciate your partnership!

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Rh

Meet Rh, the grand poo-bah among blood group systems. The Rh clan considers itself very important, and for good reason. It's the largest of the blood systems, with more than 50 antigen members. And it holds the seat of honor in the bloodstream as part of the red cell membrane. But the real reason Rh claims bragging rights as the leading blood group system is its deadly power. As little as 0.03 mL of RhD positive red cells can create antibodies in an RhD negative patient, making Rh the major culprit in Hemolytic Disease of the Fetus and Newborn (HDFN).

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
D	RH1	85%	92%	89%	96%	>99%	>99%
C	RH2	68%	27%	64%	87%	92%	88%
E	RH3	29%	22%	30%	20%	40%	51%
c	RH4	80%	96%	79%	58%	48%	57%
e	RH5	98%	98%	95%	98%	94%	91%



MNS

The granddaddy of the blood systems, MNS was the second blood groups system to be discovered in 1927 and also has the second largest family with more than 45 antigens identified. The MNS antigens are also involved in malarial infections and many altered forms of the antigen are believed to have evolved as countermeasures to the *Plasmodium falciparum* parasite.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
M	MNS1	78%	74%	96%	89%	81%	79%
N	MNS2	72%	75%	45%	65%	67%	67%
S	MNS3	55%	31%	65%	55%	7%	10%
s	MNS4	89%	93%	78%	89%	>99%	>99%



Kidd

Now you see it, now you don't. Kidd antibodies are famous for its disappearing act, first making patients miserable then hiding in the blood so it can't be found. Kidd antibodies often manage to repeat this trick a time or two before finally being caught. Kidd's reputation as a troublemaker is well-deserved, hemovigilance data has confirmed that it is the leading cause of delayed hemolytic transfusion reactions.

Frequency	Caucasian	Black	Arabic	Indian	Chinese	Japanese	Brazilian
Jk ^a	JK1	77%	92%	58%	81%	69%	67%
Jk ^b	JK2	74%	49%	50%	68%	74%	82%
Comment	Jk(a+b-) phenotypes occur rarely in most populations, highest in Polynesians (1.4% in Niueans and 1.2% in Tongans)						



Mi

As the newest member of this motley crew, Mia is getting a great deal of attention, which is nice because she usually doesn't get much consideration from transfusion professionals since she has been known to be a discrete antigen. Occurrence in most populations is less than 0.01% but our Asia Pacific colleagues could potentially see a much higher prevalence! The most famous Mi(a+) phenotype is a hybrid gene comprised mostly of glycoprotein B and only a small functional splice site from glycoprotein A. Hence, our mascot is a hybrid panda-dragon! This special lady is clearly a member of the MNS family - sharing their distinctive pattern of spots. Capture®'s Gp.Mur plates are proven super-sleuths for this antibody.

Frequency	European	African	Chinese	Thai
Gp.Mur	Rare	Rare	7%	10%



Diego

Where in the world is Diego? Diego loves to play hide and seek and is resistant to enzyme treatment. If you are looking for Dia be sure to check South, Central or Latin America. If you still can't find him, be sure to check the Asia Pacific area. As populations become more global in nature Dia occurrence is also increasing in other areas of the world. Since Dia is infrequent it may not be around most of the time; however when the antibody is present it can cause Hemolytic Transfusion Reactions and Hemolytic Disease of the Fetus and Newborn - it was first discovered because it caused HDFN in Mrs. Diego's baby.

Frequency	Caucasian	Black	Chinese	Japanese	Brazilian
Di ^a	DI1	0.01%	Rare	4%	9%
Di ^b	DI2	>99%	>99%	>99%	>99%
Comment	>30% in some South American Indian groups have Di ^a				



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