

LSBT

# Platelet Immunology

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Case Study 2020-1



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## Introduction

### **Clinical history:**

- 41 year old Canadian woman originated from Africa
- Fourth pregnancy (three voluntary abortions)
- Delivery of a male dead newborn at 39 weeks of gestation
- Newborn platelet count not defined, but intracranial haemorrhage identified as being the obvious cause of the death

## Laboratory Investigation

### **Platelet Immunology laboratory of Hema-Quebec in Montreal:**

- HPA genotyping of the parents: no incompatibility in HPA-1. Difference in HPA-5 and -15 observed (Table 1)
- No platelet antibody against GPIbIX, Ialla, and IIbIIIa (MAIPA assay)
- Cross-match of maternal serum against father's platelets also negative against GPIbIX, Ialla, and IIbIIIa (MAIPA assay)



## Laboratory Investigation

### **Platelet Immunology laboratory of Hema-Quebec in Montreal:**

- Additional investigations performed with Luminex (PakLx): anti CD36 iso-antibodies identified in the maternal serum (Table 2)
- No additional testing can be performed on CD36 by Hema-Quebec

# Laboratory Investigation

## Platelet Immunology laboratory of Hema-Quebec in Montreal:

Table 2: HPA Serology results with PakLx kit

Glycoprotein Group	Antigen	MFI	Bead Reactivity	Adjusted Ratio 1	Adjusted Ratio 2	Adjusted Ratio 3
Con1	Con1	86				
Con2	Con2	76				
Con3	Con3	93				
POS	POS	19866				
GPIV	GPIV	3393	Positive	35.23	37.75	32.46
HLA Class I	HLA Class I	95	Negative	-3.56	-4.14	-3.27
GPIIb-IIIa	HPA - 1a-3a-4a	294	Negative	-8.75	-10.44	-8.06
GPIIb-IIIa	HPA - 1a-3b-4a	243	Negative	-7.67	-8.57	-6.93
GPIIb-IIIa	HPA - 1b-3a-4a	209	Negative	-6.97	-8.33	-6.58
GPIIb-IIIa	HPA - 1b-3b-4a	198	Negative	-6.38	-7.52	-6.06
GPIIb-IIIa	HPA - 1ab-3ab-4a	258	Negative	-8.94	-9.79	-8.37
GPIIb-IIIa	HPA - 1a-3ab-4b	312	Negative	-8.91	-10.51	-7.6
GPIb/IX	HPA - 2a	101	Negative	-4	-4.55	-4.1
GPIb/IX	HPA - 2a	135	Negative	-4.02	-5	-3.99
GPIb/IX	HPA - 2ab	104	Negative	-3.76	-4.33	-3.63
GPIb/IX	HPA - 2b	120	Negative	-4.07	-4.65	-4.03
GPIb/IX	HPA - 2b	102	Negative	-3.73	-4.05	-3.43
GPIa-IIa	HPA - 5a	157	Negative	-4.84	-5.27	-4.15
GPIa-IIa	HPA - 5a	190	Negative	-4.69	-5.48	-4.47
GPIa-IIa	HPA - 5ab	198	Negative	-5.08	-6.12	-4.81
GPIa-IIa	HPA - 5b	140	Negative	-4.73	-5.83	-4.53
GPIa-IIa	HPA - 5b	156	Negative	-5.65	-5.92	-4.99

## Laboratory Investigation

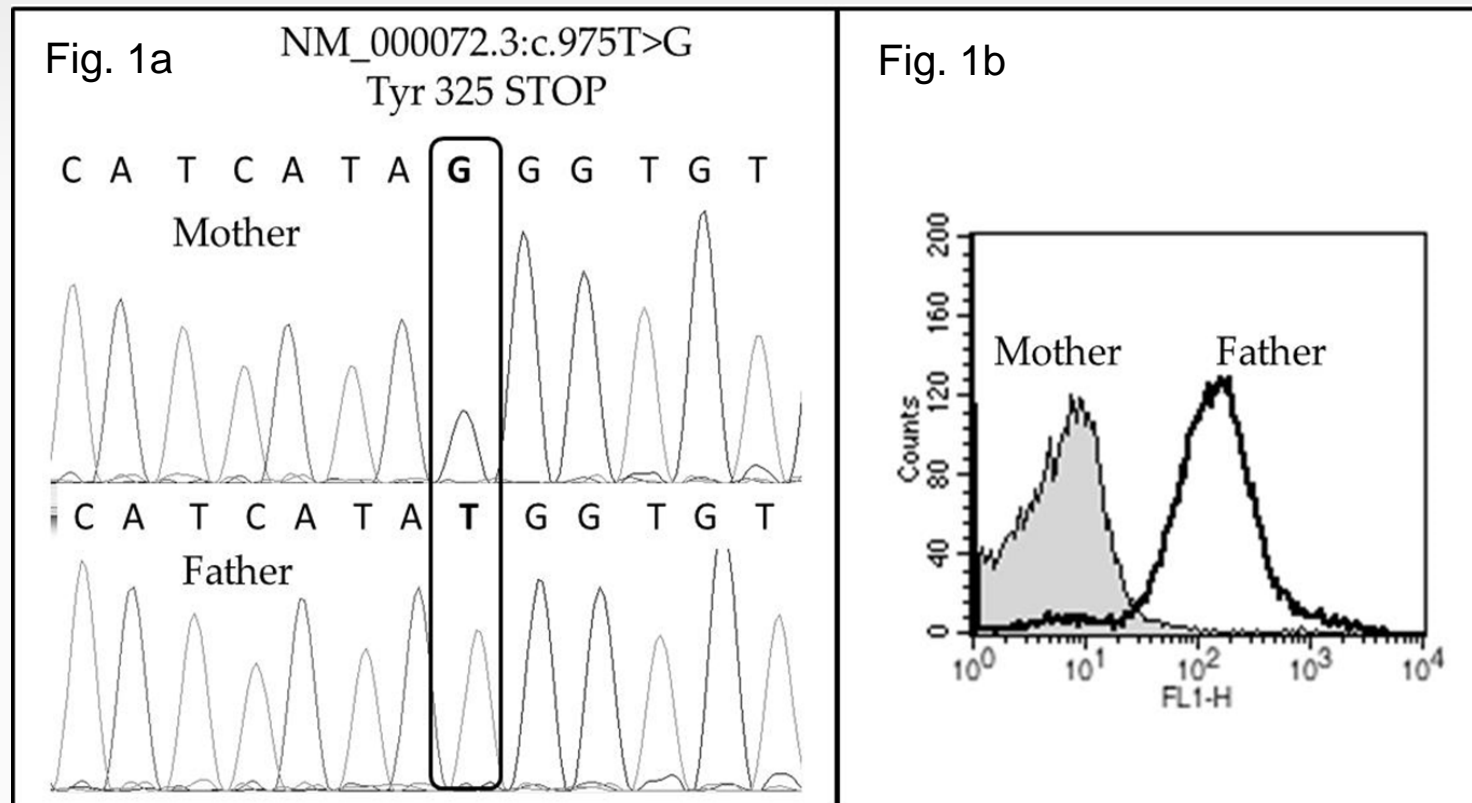
### **Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:**

- Anti CD36 iso-antibodies confirmed with PakLx
- Maternal serum Negative in MAIPA assay (monoclonal antibodies: FA6-152, 10,5 and TR9)
- Platelet phenotyping: CD36 Negative for the mother, and Positive for the father (Flow Cytometry) (Fig. 1b)
- CD36 gene exons sequenced (Fig. 1a)



# Laboratory Investigation

## Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:



## Laboratory Investigation

### **Platelet Immunology laboratory, BloodCenter of Brittany in Rennes:**

- Mutation on Exon 10 of mother's CD36 gene, absent for the father: NM\_000072.3:c.975T>G
- Mutation already been described as the most frequent in African people and already recorded as rs3211938 in the international database

## Basis on CD36 Deficiency

- CD36: Multi-ligand receptor expressed on platelets, monocytes, macrophages, capillary and mammary endothelium, adipocytes
- 2 types of CD36 deficiency: Type I lacking CD36 on both platelets and monocytes; Type II only platelets affected
- Deficiency mainly observed in Asian and African populations (2-9%)

## Conclusion

### **How to manage a future pregnancy:**

- Non-invasive antenatal therapy based on intravenous immunoglobulin (Ivlg). Only few cases of treated women in the literature
- Mother's platelets collected before pregnancy, and frozen (if possible)
- Screening of CD36-deficient blood donors in Brittany
  - Should we export this practice in other countries?

## Conclusion

### **How to manage a future pregnancy:**

- Platelet count of the newborn at delivery
- If severely thrombocytopenic:
  - Transfusion of mother's platelets when collected before pregnancy
  - Transfusion of CD36 negative platelets if available

## Lessons Learned by the Case

- Importance to know the ethnic origin of the family
- Think to screen CD36 antibody in case of Asian/African mother
- Try to collect maternal platelets or donor platelets if you can store it frozen

## References

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Case Report

## Neonatal Intracranial Hemorrhage with a Dramatic Outcome Due to Maternal Anti CD36 Antibodies

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