The Platelet Society

Grey platelet syndrome

What is it?

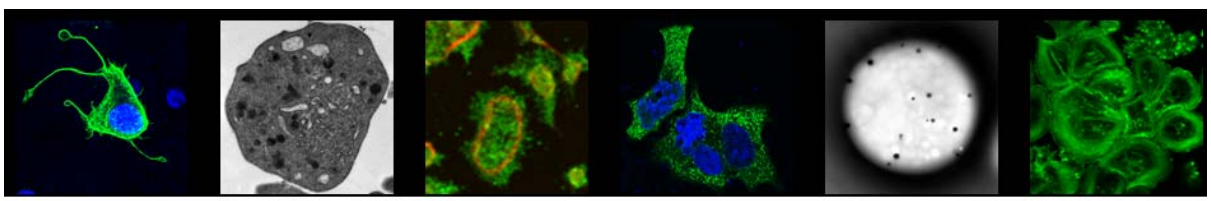
- **Grey platelet syndrome** (**GPS**) is a rare, inherited bleeding disorder
- **GPS** is caused by mutations in the *Neurobeachin-like 2 (NBEAL-2)* gene.
- **GPS** was first described in 1971 by the American haematologist, Dr Giovanni Raccuglia, but it was not until 2011 that it shown to be caused by mutations in *NBEAL-2*. This was discovered by three independent three research teams, including one in the UK.
- *NBEAL-2* is found in platelets and the platelet mother cell, the megakaryocyte.
- *NBEAL-2* is a protein that is required for the normal assembly of the contents of a particular type of storage granule in platelets known as an α-granule. The α-granules release proteins that support platelet aggregation (clumping) and which also help to repair the injury and prevent infection.
- Mutations in *NBEAL-2* cause a mild reduction in the number of platelets (thrombocytopenia) and a mild defect in platelet function.

Who suffers?

- **GPS** affects equal numbers of males and females. Two copies of the mutant gene are inherited (one each) from the mother and father (autosomal recessive). It is therefore more common in families were individuals are blood relatives of each other. In general carriers of the condition (who only have one mutated gene) do not experience clinical problems.
- **GPS** is rare. There are fewer than one hundred patients worldwide, and fewer than ten patients in the UK.
- **GPS** can be diagnosed from childhood to old age.

What are the symptoms?

- Patients with **GPS** may experience nose bleeding, easy bruising, bleeding from gums, heavy or prolonged menstrual bleeding (menorrhagia), bleeding after childbirth, abnormal bleeding after surgery or dental work, and gastrointestinal bleeding.



Diagnosis

- Patients have a low platelet count (thrombocytopenia) and enlarged platelets.
- Platelets appear grey on a blood film when examined. This is one of the first tests performed in a hospital. Other platelet disorders can also have grey platelets.
- Platelets may undergo normal platelet aggregation (clumping) but have reduced α-granule release. This can be detected by a technique called flow cytometry using an antibody to a protein in α-granules called P-selectin.
- A definitive diagnosis of **GPS** is made by genetic sequencing.

Treatment

- Treatment should be led by and discussed with a haematologist with experience in bleeding disorders.
- Treatment is the same as other conditions where there are platelet function defects. General strategies include avoidance of medications that inhibit platelet function further (e.g. aspirin), and compression at sites of injury. Patients may be treated with antifibrinolytics (e.g. tranexamic acid) or platelet transfusion prior to surgery.
- Patients should carry a bleeding disorders / haemorrhagic states card (issued by a Haemophilia Care Centre) to alert others to their condition.
- Genetic counselling may be offered.

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