

About Platelets

What are platelets and what do they do?

Platelets are very small cells in blood that play an important role in the prevention of blood loss from the circulatory system. When blood vessels are damaged, exposed proteins provide a sticky surface which platelets recognise as a site of injury, and as a result they cling to each other to plug the damaged area and prevent blood loss. This process is known as haemostasis and constitutes the primary role of platelets.

Platelets play a key role in thrombosis

Fatty deposits can form plaques in arteries which can lead to restriction of blood flow to key organs and cause a disease known as atherosclerosis. Under certain conditions these plaques can rupture exposing proteins that can cause platelets to stick together causing a clot, a condition called thrombosis. This can have severe consequences. Indeed, if the clot blocks the flow of blood through a coronary vessel, this could lead to a heart attack, or if the clot blocks the flow of blood to the brain, this can cause stroke.

Thus platelets play an important role in maintaining the circulatory system (haemostasis) and also play a role in the development of disease (thrombosis).

Why study platelets?

Much effort has been made to find drugs that protect people from thrombosis without affecting the important process of haemostasis. Although several drugs are currently in use they do not prevent further thrombosis in everyone who takes them, Therefore, it is important to study platelets in greater detail to understand how they function in order to suggest new targets for antiplatelet drugs.

Studying people with bleeding disorders helps us understand how platelets work

Disorders of platelet function giving rise to bleeding are rare occurrences, often presenting with mild symptoms which make the study of this disease particularly challenging. As a consequence, little is known about the natural history of bleeding disorders, and their treatment remains under-studied. Therefore, studying people with bleeding disorders provides crucial information on this rare disease and increases our awareness of the causes of mild bleeding in people with inherited disorders. Moreover, the study of people who have bleeding problems due to a defect in platelet function provides information on the importance of certain proteins in platelet function. These proteins could potentially be used as new targets for the development of novel antiplatelet agents.

What we do in the laboratory

We carefully study platelet function using several techniques which target the various aspects of platelet behaviour required to form clots. We use carefully standardised procedures and reagents to investigate platelet function in detail. This is called phenotyping. Genomic DNA (the genetic "code" of the cell) is prepared from the blood sample and subjected to DNA sequencing which lets us "unlock the code" to look for mutations in key proteins involved in pathways which we have seen to be defective by platelet function testing. This is called genotyping.