

Supplementary Information

Hemocompatibility of Super-Repellent surfaces: Current and Future

Sanli Movafaghi,^a Wei Wang,^a David L. Bark Jr.,^{a,b} Lakshmi P. Dasi,^{*c} Ketul C. Papat^{*a,b} and Arun K. Kota^{*a,b,d}

^a Department of Mechanical Engineering, Colorado State University, Fort Collins, CO 80523, USA. E-mail: ketul.papat@colostate.edu; arun.kota@colostate.edu

^b School of Biomedical Engineering, Colorado State University, Fort Collins, CO 80523, USA.

^c Department of Biomedical Engineering, The Ohio State University, Columbus, OH 43210, USA. E-mail: dasi.1@osu.edu

^d Department of Chemical & Biological Engineering, Colorado State University, Fort Collins, CO 80523, USA.

Table S1. The blood components and biological terms in the context of blood-material interactions.

Blood components	Description
Albumin	Plasma protein that does not bind to platelets.
Plasma	The liquid portion of blood that serves as a transport system for blood cells.
Erythrocyte	Cell that carries oxygen and plays a major role in blood viscosity.
Fibrinogen	Plasma protein involved in platelet adhesion at low shear stress. It can be converted to fibrin by thrombin.
Leukocyte	White blood cells, which aim to attack foreign bodies.
Lymphocyte	White blood cells that respond to antigens (toxins or foreign bodies) for specific responses.
Monocyte	The largest leukocyte. It is involved in phagocytosis (ingestion of bacteria or other material), antigen presentation, and cytokine production.
Neutrophil	The most abundant leukocyte that is important in presenting antigens.
Plasma proteins	Proteins found in blood plasma.
Platelet	Anucleate cell involved in hemostasis and thrombosis.
von Willebrand Factor	Plasma protein involved in platelet adhesion at high shear stress.

Biological terms	Description
ADP	An important compound in metabolism that can act as a platelet activation agonist.
α -granule	Granules within platelets that can release upon platelet activation. The contents of these granules include growth factors and prothrombotic proteins.
$\alpha_{IIB}\beta_{III}$	A major integrin on platelets that binds to proteins, including fibrinogen, von Willebrand Factor, and fibronectin.
Anticoagulant	A drug used to prevent coagulation.
Anti-inflammatory	Conditions that resist or prevent inflammation.
Antiplatelet therapy	A drug used to prevent platelet function.
Anti-thrombotic	Conditions that prevent or reduce the formation of blood clots.
Apoptosis	Programmed death of a cell.
Coagulation cascade	Secondary hemostasis, commonly known as blood clotting, that is involved in fibrin formation.
Complement System	A part of the immune system (consisting of over 20 plasma proteins) that plays a significant role in body's defense mechanism.
Cytokine	Proteins secreted by certain cells of the immune system. They are signaling molecules that mediate and regulate immune response.
Differentiation	Process by which a less specialized cell develops to become more distinct in form and function.
Endothelialization	The process of endothelial cells (in the inner lining of blood vessels) multiplying or migrating to a region.
Extracellular matrix	A three dimensional network of macromolecules outside of cells that provides structural support and can be involved in biochemical transport.
Fibrin	A protein that forms a fibrous mesh that is involved in blood clots.
Fibrinolysis	Breakdown of fibrin.
Fibroblast	A cell commonly involved in connective tissue that is important to wound healing.
Fibrosis	Formation of excess fibrous connective tissue.
Foreign body giant cells	A collection of fused macrophages, generated in response to large foreign bodies.
Hemoglobin	Protein responsible for oxygen transport in erythrocytes.

Hemolysis	Rupture of the erythrocyte membrane.
Inflammation	Immune response via which white blood cells protect the body from foreign bodies.
Integrin	A protein that usually has the mechanical function of attaching a cell to a surface.
Intimal hyperplasia	Thickening of the intima (middle layer of a blood vessel).
Macrophage	A white blood cell that engulfs foreign bodies.
Neutrophil extracellular traps	A meshwork of DNA fibers extruded from neutrophils.
Phosphatidylserine	A phospholipid, normally present on the interior side of cell membranes.
Platelet activation agonists	Stimulators for platelet activation.
Polymorphonuclear leukocytes	Leukocytes with multi-lobed nucleus. Also called granulocytes.
Procoagulant	Conditions that support coagulation.
Pro-inflammatory	Conditions that support inflammation.
Protein denaturation	Process in which protein structure lose structure.
Prothrombotic	A condition that supports thrombosis.
Protofibrils	Accumulation of fibrin monomers into a strand.
Thrombin	A potent platelet activation agonist and a substance that is critical for converting fibrinogen to fibrin.
Thrombosis	The process of or occurrence of thrombus formation.
Thromboxane	A platelet activation agonist that can be released from platelet alpha granules.
Thrombus	The formation of blockage in the vascular system with constituents that depend on local flow conditions, but can involve various combinations of platelets, fibrin, and erythrocytes.
Toll-like receptor 4	Immune receptor involved in recognizing molecules presented by pathogens.