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LL37, an antimicrobial peptide underpins thrombotic complications during inflammatory diseases

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LL37, a powerful antimicrobial peptide against bacteria, fungi and viruses, is released by activated immune cells during microbial infections. It modulates both innate and adaptive immune responses by stimulating specific receptor-mediated [predominantly formyl peptide receptor 2 (FPR2/ALX)] signalling within the immune cells. Despite in-depth research on the significance of LL37 in the modulation of inflammatory responses at various pathological settings, the effects of LL37 on the regulation of thrombosis and platelet-mediated inflammatory responses have not been established previously, specifically in sepsis and psoriasis. Platelets, small blood cells play significant roles in the regulation of innate immunity, inflammatory responses and microbial infections in addition to haemostasis and thrombosis. Activation of platelets during inflammatory diseases such as psoriasis induces the formation of blood clots or disseminated intravascular coagulation in capillaries, or aggregation. Here we demonstrate the effects of LL37 in the modulation of platelet reactivity, haemostasis and thrombosis. LL37 activates a range of platelet functions and enhances thrombus formation under arterial flow conditions. Similarly, LL37 reduces bleeding time in mice indicating its significance in the modulation of haemostasis under physiological conditions. Moreover, with the aid of selective inhibitors and genetically modified mice that are deficient in formyl peptide receptors, we determined the functional dependence of LL37 on FPR1 and FPR2/ALX. Since the level of LL37 released during inflammation is significantly higher than normal, a fuller understanding of its functions on the modulation of platelet reactivity will pave the way for the determination of the fundamental mechanisms for thrombotic complications in distinctive inflammatory diseases and offer the potential for development of improved therapeutic strategies.

Biography

Divyashree Ravishankar has completed her PhD in Pharmaceutical chemistry from University of Reading and currently working as a Postdoctoral researcher at Pharmacology department in University of Reading, UK.

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