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Platelet-rich plasma extract in lung angiogenesis and regeneration

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Angiogenesis, the growth of new blood capillaries plays a key role in organ development and regeneration. Recently, we have reported that soluble platelet-rich plasma (PRP) extract which contains abundant angiotensin-1 and multiple other angiogenic factors stimulates angiogenesis *in vitro* and *in vivo*. We have also found that PRP extract maintains endothelial cell (EC) integrity *in vitro* and prevents endotoxin induced pulmonary edema in a mouse lung injury model. Here we demonstrate that mouse PRP extract also accelerates EC sprouting and lung epithelial cell budding by changing the activity of the Wnt co-receptor low-density lipoprotein receptor-related protein 5 (LRP5) *in vitro*. PRP extract also enhances compensatory lung growth and recovery of exercise capacity after unilateral pneumonectomy in mice while Lrp5 knockdown attenuates the effects of PRP extract. Since human PRP extract is generated from autologous peripheral blood and can be frozen for long-term storage, these findings may indicate a novel treatment for various angiogenesis-related lung diseases and could potentially advance strategies for lung organ engineering.

Biography

Akiko Mammoto received her PhD from Osaka University in Japan and completed her Postdoctoral studies at Boston Children's Hospital/Harvard Medical School. She is currently an Instructor in Vascular Biology Program at Boston Children's Hospital. She has published more than 65 papers in high impact journals and serves as an Editorial Board Member of *Scientific Reports*.

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