3-P2-LB48 LBS

Relationship between plasma extracellular vesicles (EV) and systemic blood pressure in Otsuka Long-Evans Tokushima Fatty (OLETF) rats

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Background EV are spherical particles enclosed by a lipid bilayer and classified as small EV (diameter: 50-150 nm) and large EV (50-1000 nm). We have previously shown that plasma small EV regulate blood pressure (BP) in spontaneously hypertensive rats. Lifestyle-related diseases are risk factors for hypertension development. However, roles of EV on BP regulation in obese type 2 diabetic animal models have not been clarified. We aimed to clarify relationship between elevation of BP and plasma small EV in OLETF rats.

Methods Systolic BP of OLETF and control Long-Evans Tokushima Otsuka (LETO) rats (6-21-week-old) was measured by a tail-cuff method. Plasma small EV were isolated by a sucrose-cushion ultracentrifugation. Concentration and diameter of EV were measured by a tunable resistive pulse sensing method.

Results Systolic BP of OLETF (11-21-week-old) rats was higher than LETO rats. Concentration but not diameter of plasma small EV in OLETF (17-21-week-old) rats increased compared with LETO rats.

Conclusion Causal relationship may exist between elevation of BP and increase of plasma small EV in OLETF rats. Further study examining functions of plasma small EV is required.