

Proteomics analysis of sweat exosome provides new insights into the skin immune homeostasis

With the supports from the National Key Research and Development Program, National Natural Science Foundation of China, and Technique Innovation Program of Hubei Province, a collaborative study by the research groups led by Prof. Liu ZhengFei (刘正飞) from Huazhong Agricultural University demonstrates that secreted exosomes exist in the human sweat. Further proteomic profiling of sweat exosome provides insight into sweat features and potential physiological significance in immune homeostasis, which was published in *Journal of Investigative Dermatology* (2017, DOI:10.1016/j.jid.2017.05.040).

Exosomes are cell-derived 50–100 nm vesicles, which represent a new pathway of cell signaling and can be found in many body fluids, including serum, urine, and saliva. In this work, sweat samples were collected after aerobic exercise from healthy adult volunteers, and exosomes were successfully isolated from human sweat by filtering and ultracentrifugation procedures. Western blot, gas chromatography as well as PCR of bacterial 16S rRNA proved that sweat exosomes were not derived from holocrine secretion of corneocyte, sebaceous gland, or bacteria on skin surface that might contaminate sweat. Using high resolution LC-MS/MS, 1062 proteins were identified, including 977 different proteins compared with sweat proteomics, and 896 unique proteins compared with urine, saliva and plasma exosomes which display possibility of biomarkers for disease diagnosis from sweat. Importantly, diverse antimicrobial peptides and immunological factors were found in sweat exosomes, suggesting the involvement of exosomes in skin immunity.

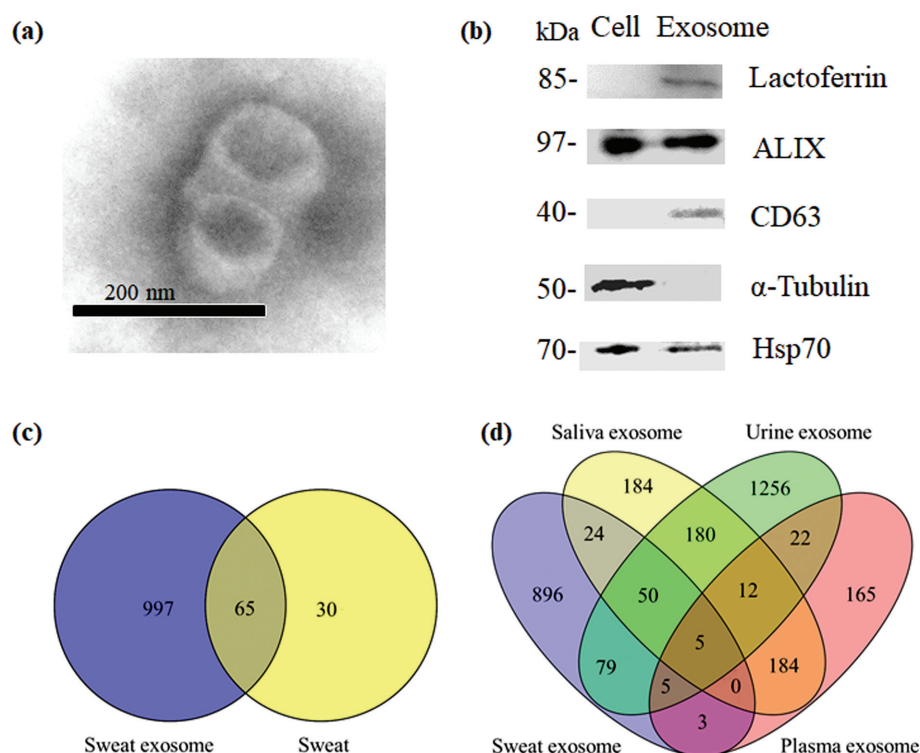


Figure (a) Electron micrograph of sweat exosome. (b) Western blot of sweat exosome. (c) Venn diagram of total proteins from sweat exosome and sweat. (d) Venn diagram of total proteins from sweat, saliva, urine and plasma exosomes.