S26-2 Molecular action mechanism of metallo-allixin complexes as anti-diabetic agents and metabolic imaging of bio metals

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Metal-complexes have been proposed as new type of anti-diabetogenic compounds for treating of both type 1 and type 2 diabetes. Vanadyl or zinc allixin complexes exhibited not only a hypoglycemic effect but also the improvement of hyperinsulinemia, hyperchoresterolemia, and hypertension in diabetic mice. Moreover, zinc allixin analog improved the level of adiponectin in type 2 diabetic mice. We then examined whether vanadyl and zinc allixin compounds enhance the insulin-signaling molecules, such as Akt kinase, and the translocation of glucose transporter (GLUT4) to the plasma membrane. Both complexes enhanced Akt kinase and the GLUT4 translocation to the plasma membrane. We also found that the intracellular vanadyl or zinc concentration is essential for activating both Akt kinase and GLUT4 translocation. In addition, we have examined gene expression profiles to compare the effects of insulin and vanadyl allixin treatments in type 1 diabetic mice. The alteration of gene expression by the treatment of vanadyl allixin was similar to that of insulin. Our experiments suggested that vanadyl and zinc allixin complexes act on the insulin-signaling cascade, leading to improve the biochemical reaction in the cells and animal tissues. Furthermore, it is important to visualize the localization and dynamics of metal complexes by imaging system. Recently, our laboratory has developed a gamma-ray emission imaging system (GREI). We have been successful in visualizing the multi molecular probes *in vivo* by using this system. Here, we would like to introduce GREI system that diabetic animal models were visualized.