1. **No.**

   FP01805070

2. **Title**

   Hemoglobin Based Carbon Monoxide Delivery for Treatment of Lethal Rhabdomyolysis

3. **Period**

   2016-2018

4. **Summary**

Many victims, after being extricated from a collapsed building as the result of a disaster, suffer from disaster nephrology, a term that is referred to as the crush syndrome. In the present study, we examined the therapeutic performance of a biomimetic carbon monoxide (CO) delivery system, CO-enriched red blood cells (CO-RBC), on experimental animal models of acute renal injury (AKI) induced by traumatic and non-traumatic rhabdomyolysis, including the crush syndrome. A single CO-RBC treatment was found to effectively suppress the pathogenesis of AKI with the mortality in these model rats being improved. In addition, in further studies using non-traumatic rhabdomyolysis model rats induced by treatment with glycerol, the pathogenesis of which is similar to that for the crush syndrome, CO-RBC was found to have renoprotective effects via the suppression of the subsequent heme protein-associated renal oxidative injury; the oxidation of myoglobin in the kidneys, the generation of reactive oxygen species by free heme produced from degraded-cytochrome P450 and hemoglobin-associated renal injury. Because CO-RBC can be prepared and used at both hospitals and at a disaster site, these findings suggest that CO-RBC has the potential for use as a novel cell therapy against crush syndrome-induced AKI.