Claims:

1. Use of hemoglobin based oxygen carrier in preparation of an oral formulation for preventing and/or treating high altitude syndrome (HAS) and/or hypoxic conditions in a subject in need thereof, wherein

said hemoglobin-based oxygen carrier is formulated to be administered orally and delivered in a controlled release manner to a target site along the intestinal tract of the subject, and

wherein said delivering to the target site along the intestinal tract of the subject is pH-dependent such that the hemoglobin is delivered to the subject's bloodstream in a substantially undegraded form, wherein said formulation comprises enteric-coated capsule and enteric-coated tablet, and

wherein said enteric-coated capsule or enteric-coated tablet comprises polyacrylic resin coated gelatin capsules filled with a lyophilized form of the hemoglobin based oxygen carrier and one or more stabilizer, cryoprotectant, intestinal absorption enhancer, and/or tablet forming excipient, and

wherein said intestinal absorption enhancer is selected from the group consisting of polyoxyethylene-20-sorbitan monooleate and poly(ethylene oxide)-poly(propylene oxide)- poly(ethylene oxide) tri-block copolymer.

2. Use of hemoglobin based oxygen carrier in preparation of an oral formulation for preventing and/or treating anemia and/or hypoxic conditions in a subject in need thereof, wherein

said hemoglobin-based oxygen carrier is formulated to be administered orally and delivered in a controlled release manner to a target site along the intestinal tract of the

subject, and wherein said delivering to the target site along the intestinal tract of the subject is pH-dependent such that the hemoglobin is delivered to the subject's bloodstream in a substantially undegraded form,

wherein said formulation comprises enteric-coated capsule and enteric-coated tablet, and wherein said enteric-coated capsule or enteric-coated tablet comprises polyacrylic resin coated gelatin capsules filled with a lyophilized form of the hemoglobin based oxygen carrier and one or more stabilizer, cryoprotectant, intestinal absorption enhancer, and/or tablet forming excipient, and

wherein said intestinal absorption enhancer is selected from the group consisting of polyoxyethylene-20-sorbitan monooleate and poly(ethylene oxide)-poly(propylene oxide)- poly(ethylene oxide) tri-block copolymer.

3. The use of claim 1 or 2, wherein said hemoglobin based oxygen carrier comprises one or more of purified hemoglobin, cross-linked hemoglobin, non-polymeric tetrameric hemoglobin, polymeric hemoglobin, and/or conjugated hemoglobin.

4. The use of claim 1 or 2, wherein said enteric-coated tablet further comprises a coating material selected from one or more of poly(methacrylic acid)-poly(methyl methacrylate) copolymer, hydroxypropyl methylcellulose phthalate, and/or cellulose acetate phthalate.

5. A method of preparing an oral formulation for delivering a hemoglobin-based oxygen carrier in a controlled release manner to a target site along the intestinal tract of a subject comprising:

lyophilizing a hemoglobin-containing solution followed by encapsulating the lyophilized form of hemoglobin into an enteric-coated capsule or an enteric-coated tablet,

wherein said enteric-coated capsule or enteric-coated tablet comprises polyacrylic resin coated gelatin capsules filled with the lyophilized form of the hemoglobin based oxygen carrier and one or more stabilizer, cryoprotectant, intestinal absorption enhancer, and/or tablet forming excipient, and

wherein said intestinal absorption enhancer is selected from the group consisting of polyoxyethylene-20-sorbitan monooleate and poly(ethylene oxide)-poly(propylene oxide)- poly(ethylene oxide) tri-block copolymer.

6. The method of claim 5, wherein

vitamin C or N-acetyl cysteine (NAC) is added into the solution as a stabilizer after the pH is adjusted.

7. The method of claim 5, wherein

cryoprotectants and intestinal absorption enhancers are added into the hemoglobin-containing solution prior to said lyophilizing.

8. The method of claim 5, wherein

said cryoprotectants are one or more of glucose, sucrose, and/or trehalose.

9. The method of claim 5, wherein

said enteric-coated tablet further comprises a coating material selected from one or more of poly(methacrylic acid)-poly(methyl methacrylate) copolymer, hydroxypropyl methylcellulose phthalate, and/or cellulose acetate phthalate.

10. The method of any one of claims 5 to 9, wherein

said hemoglobin-based oxygen carrier comprises one or more of purified hemoglobin, cross-linked hemoglobin, non-polymeric tetrameric hemoglobin, polymeric hemoglobin, and/or conjugated hemoglobin.