[0026] In some embodiments, the fusion protein is administered to the canine or feline subject intravenously.

[0027] The present disclosure provides a method of treating a canine or feline subject having a metabolic disease, comprising administering to the canine or feline subject an effective amount of the fusion protein of the present disclosure and/or the pharmaceutical composition of the present disclosure.

[0028] In some embodiments, the metabolic disease is diabetes.

[0029] In some embodiments, the diabetes is Type 1 diabetes.

[0030] In some embodiments, the diabetes is Type 2 diabetes.

[0031] In some embodiments, the therapeutically effective amount is administered intravenously.

[0032] In some embodiments, the therapeutically effective amount is between 0.01 mg/kg to 15 mg/kg of the fusion protein.

[0033] In some embodiments, the therapeutically effective amount is between 1 mg/kg to 15 mg/kg of the fusion protein.

[0034] In some embodiments, the method decreases fasting blood glucose in the subject by about 10%, about 15%, about 20%, about 25%, about 30%, about 35%, about 40%, about 45%, or about 50%.

[0035] The present disclosure provides a polynucleotide encoding a fusion protein for treatment of companion animals, the fusion protein comprising a proinsulin and serum albumin, wherein the proinsulin is a canine proinsulin or a feline proinsulin.

[0036] In some embodiments, the canine proinsulin-serum albumin fusion polynucleotide shares at least 80%, at least 85%, at least 90%, at least 95%, at least 99%, or 100% identity to SEQ ID NO: 2.

[0037] In some embodiments, the feline proinsulin-serum albumin fusion polynucleotide shares at least 80%, at least 85%, at least 90%, at least 95%, at least 99%, or 100% identity to SEQ ID NO: 19.

[00037a] In one aspect, provided herein is a pharmaceutical composition comprising the fusion protein as described herein.

[00037b] In another aspect, provided herein is use of an effective amount of the fusion protein as described herein or the pharmaceutical composition as described herein, in the manufacture of a medicament for the treatment of a canine or feline subject having a metabolic disease.

[00037c] In another aspect, provided herein is a polynucleotide encoding a fusion protein for use in the treatment of companion animals, the fusion protein as described herein.