Dose Optimization of SDF-1 mRNA for Treating Erectile Dysfunction.

No systemic SDF-1 expression, hematological issues, or metabolic/organ pathologies identified from use of SDF-1 mRNA doses.

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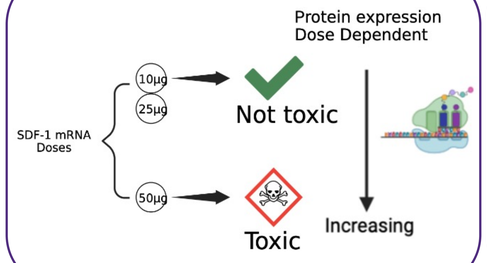
BACKGROUND/INTRODUCTION

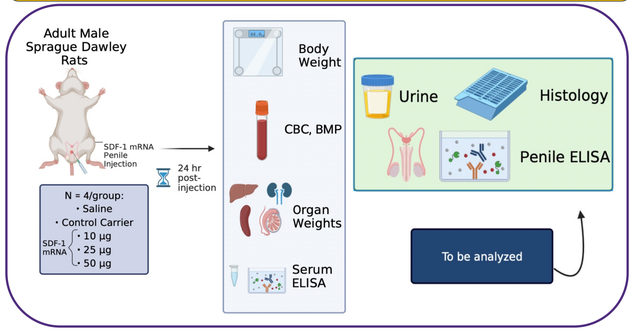
Background

- Erectile dysfunction (ED) → Low quality of life (affects about 30 million men in the US today)
- Chronic diseases (Heart, Diabetes) → Nerve/Vasculature Damage → ED
- Prostate Cancer Treatment (prostatectomy) → Nerve cannot be isolated on prostate → Nerve damage → ED
- SDF-1 protein → Endogenous repair mechanism → Restores erectile function
  Problem: Protein has a short half-life and requires expensive frequent injections to have an effect
- **Solution:** Current advances in synthetic mRNA technology (Covid-19 vaccines) → SDF-1 mRNA → Translates multiple SDF-1 proteins
  Larger therapeutic window with no frequent injections → Increased patient compliance

Hypothesis



Methods



RESULTS

No change in body/organ weight as a result of SDF-1 mRNA treatment

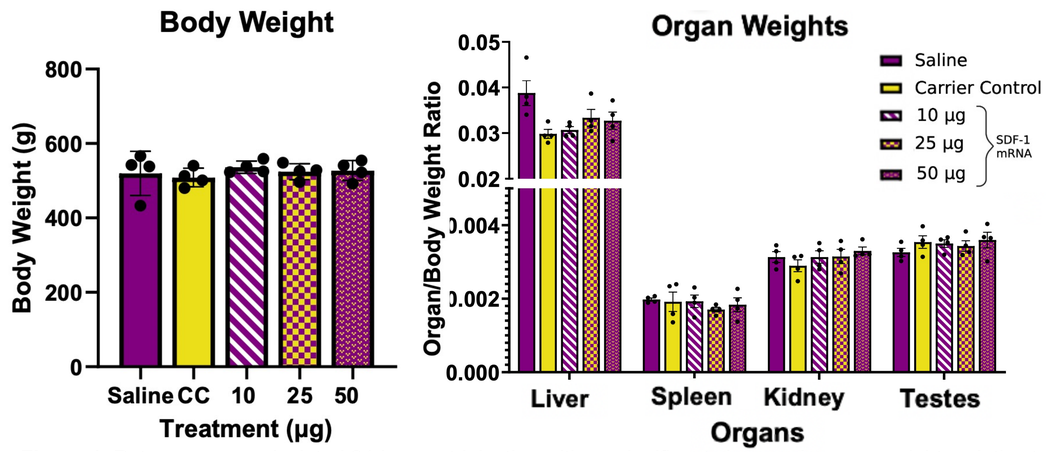


Figure 1. Rat organs were isolated 24-hrs post-injection with no significant changes in organ weights relative to body size. n=4/group (p≥0.05).

No increased systemic expression of SDF-1

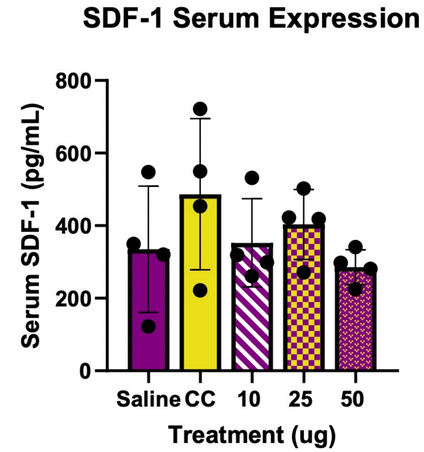


Figure 2. No systemic expression as a result of no significant differences in SDF-1 expression in serum. N=4/group ((p≥0.05).

No toxicity risk involving hematological issues or metabolic/organ pathologies

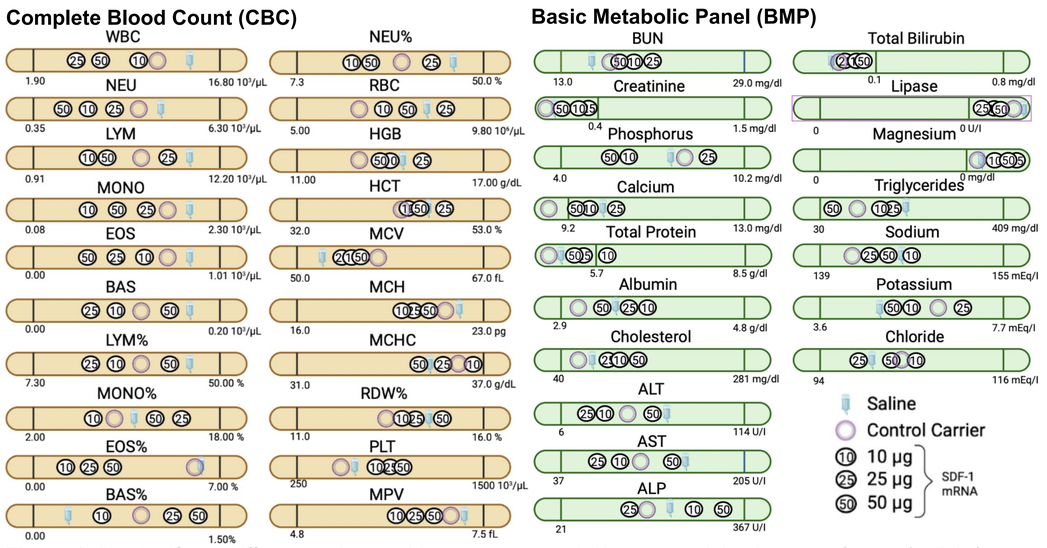


Figure 3. No significant difference observed between groups 24 hours post injections. n=4/group (p≥0.05).

CONCLUSION

The three administered doses have:

- No change in body/organ weights
- No systemic SDF-1 expression
- No hematological issues
- No identified metabolic/organ pathologies

FUTURE DIRECTIONS

1. **Penile SDF-1 ELISA data will determine whether this therapy will provide targeted protein expression to the penis.**
2. **Moving forward, optimal dose will be tested at 5 various timepoints with body/organ weights, CBC, BMP, and ELISA to analyze chronic effects.**
3. **Pre-clinical efficacy study will be performed with optimal SDF-1 mRNA dose to analyze erectile function recovery in BCNI rats.**