

## INTRODUCTION

### ❖ Cerebral Palsy (CP)

➤ Stiffness is suggested to arise from increased extracellular matrix (ECM)<sup>1</sup>

### ❖ Motivation

➤ Collagenase injections have been used to treat Dupuytren's and Peyronie's disease<sup>2,3</sup>



**Figure 1:** CP patients have limited locomotion



**Figure 2:** Dupuytren's contracture treatment with collagenase<sup>2</sup>

## PURPOSE & HYPOTHESIS

### ❖ Purpose

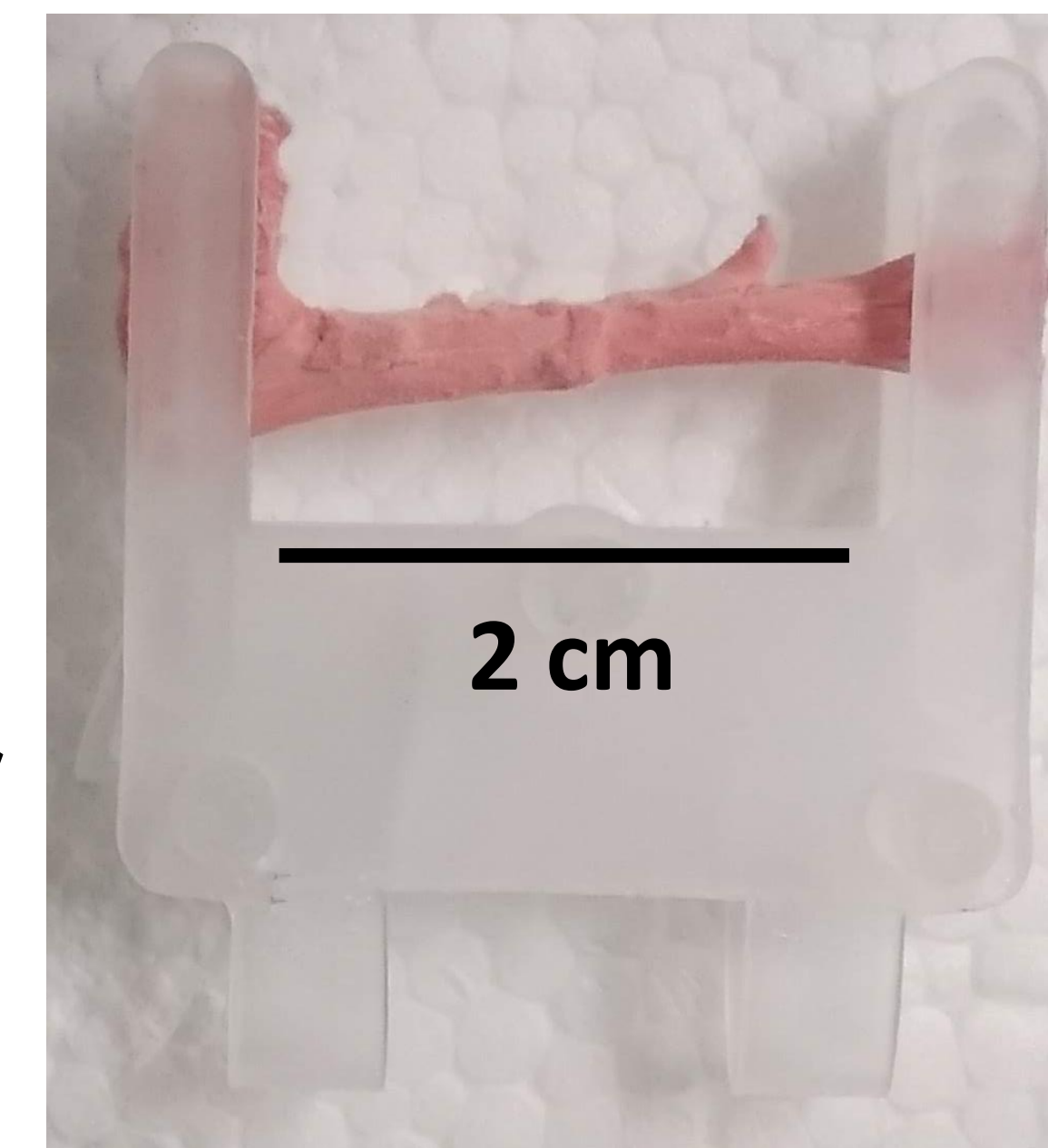
➤ Evaluate the effect of collagenase on passive force, collagen and contractile protein content of CP muscles

### ❖ Hypothesis

➤ Collagenase is effective in reducing passive force without affecting the contractile properties

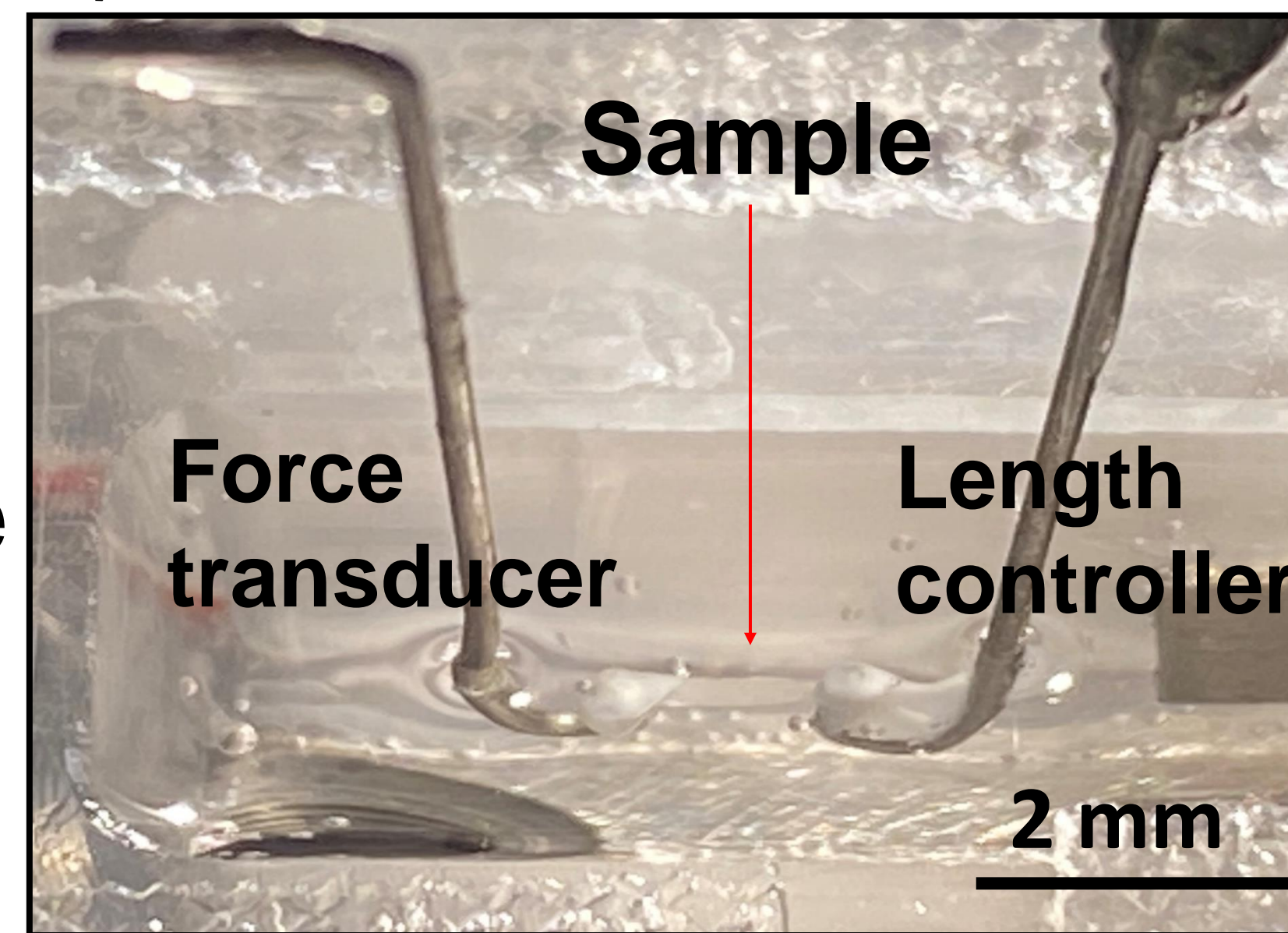
## METHODS

- Adductor longus samples (n=11)
- Stretched before and after collagenase incubation (350U/ml for 35-45 min)



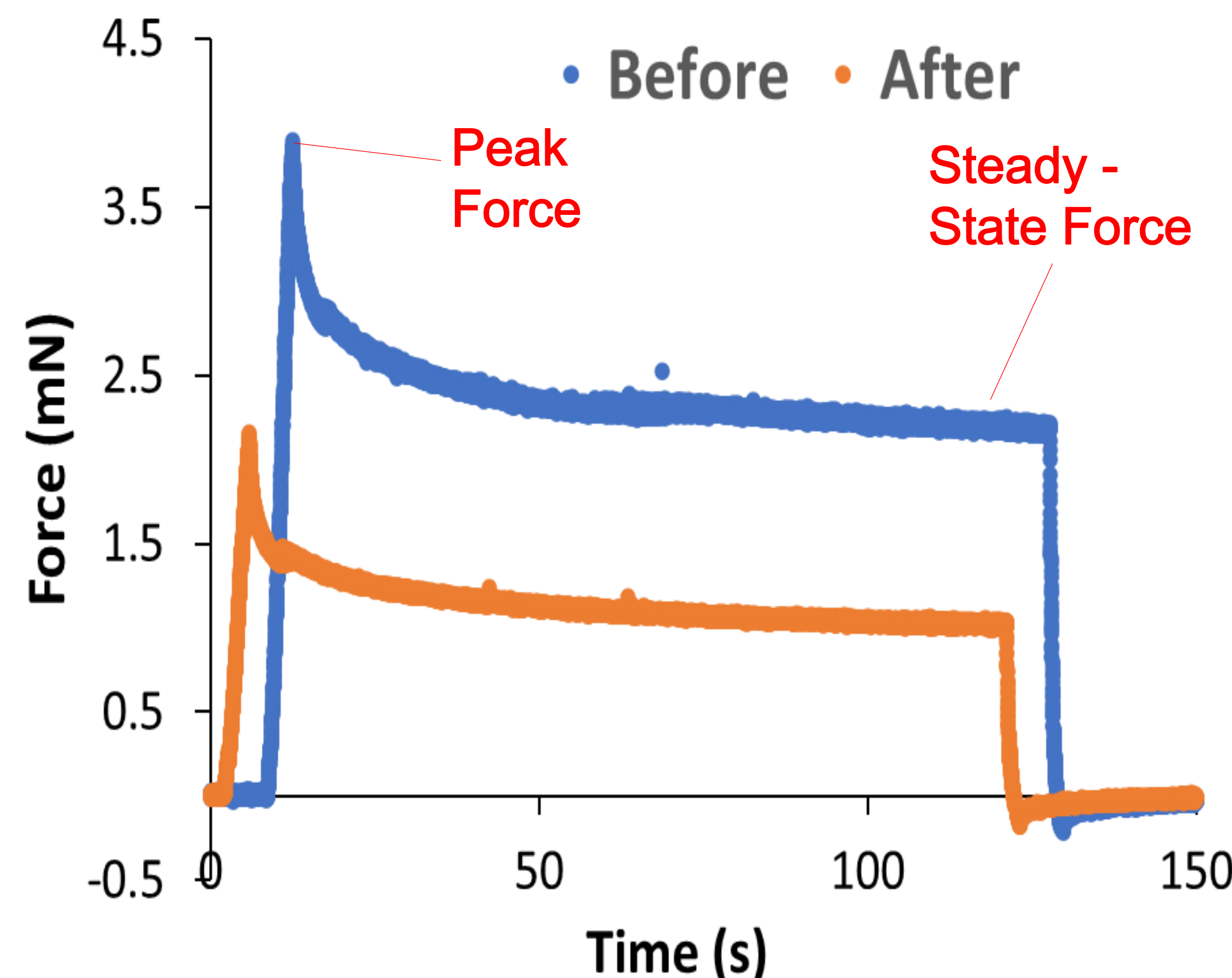
**Figure 3:** CP muscle biopsy

**Figure 4:** CP muscle sample in the testing machine



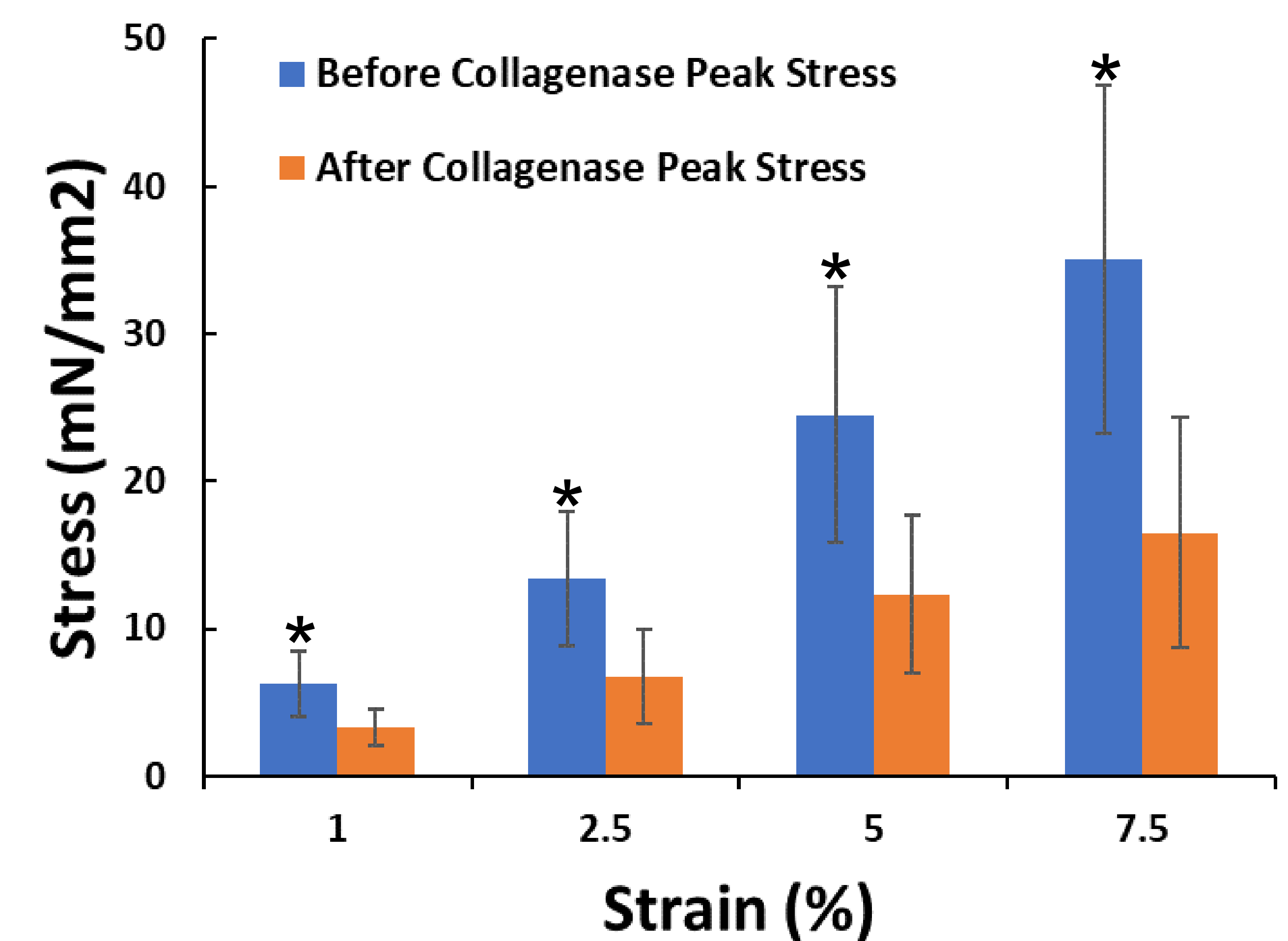
## RESULTS

- Peak and steady-state stress decreased by an average of  $49 \pm 17\%$  and  $47 \pm 15\%$ , respectively, after collagenase incubation



**Figure 5:** Passive force of a CP bundle

## RESULTS



**Figure 6:** Average peak stress  $\pm$  S.E.M at different strains before (blue) and after (orange) collagenase incubation (n=11), \*p<0.05

## DISCUSSION

- Collagenase is effective in reducing passive force in isolated CP muscles
- Further investigation of the contractile properties is still required

## CONCLUSION

- This study provides proof of concept for a potential use of collagenase injections to reduce stiffness in CP muscles.

## REFERENCES

- 1) Smith et al. (2011). *J Physio*, 589(10), 2625–2639.
- 2) Hurst et al. (2009). *N Engl J Med*, 361(10), 968–979.
- 3) Egui Rojo et al. (2014). *Therapeutic Adv Urology*, 6(5), 192–197.

## ACKNOWLEDGMENTS