

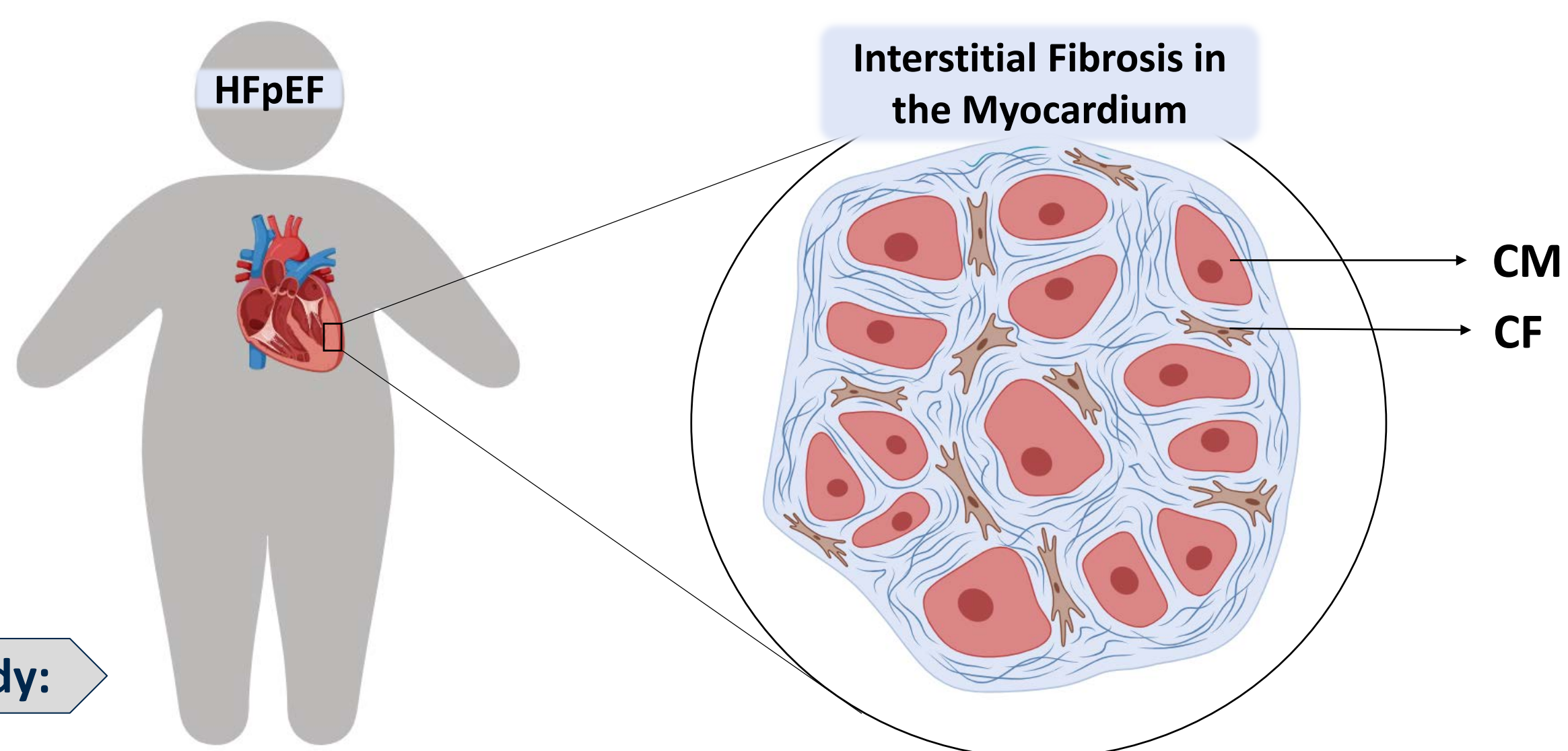
# Calcium signalling in cardiac fibroblasts and myocytes in an *in vitro* model of HFpEF

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## 1. BACKGROUND

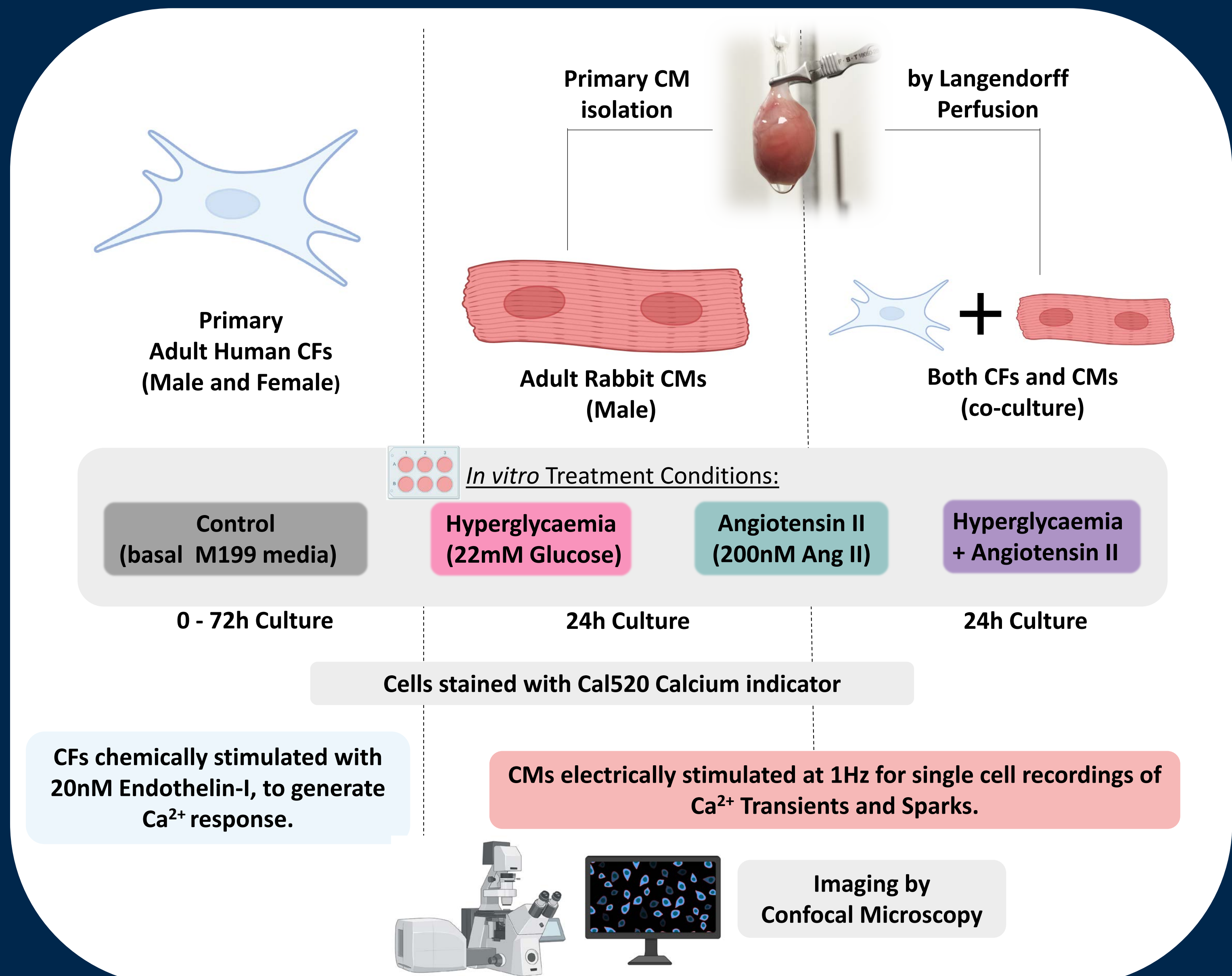
Heart Failure with preserved Ejection Fraction [HFpEF] is a pandemic associated with hypertension and diabetes amongst other co-morbidities<sup>1</sup>. It has been established that fibrosis plays a major role in this form of heart failure<sup>2</sup>. However, the functional mechanisms of cardiac fibroblasts (CFs) in HFpEF and more importantly, how these cells interact with cardiomyocytes (CMs) and impact calcium (Ca<sup>2+</sup>) signalling is limited. This limitation is majorly due to a lack of physiologically relevant cellular models.



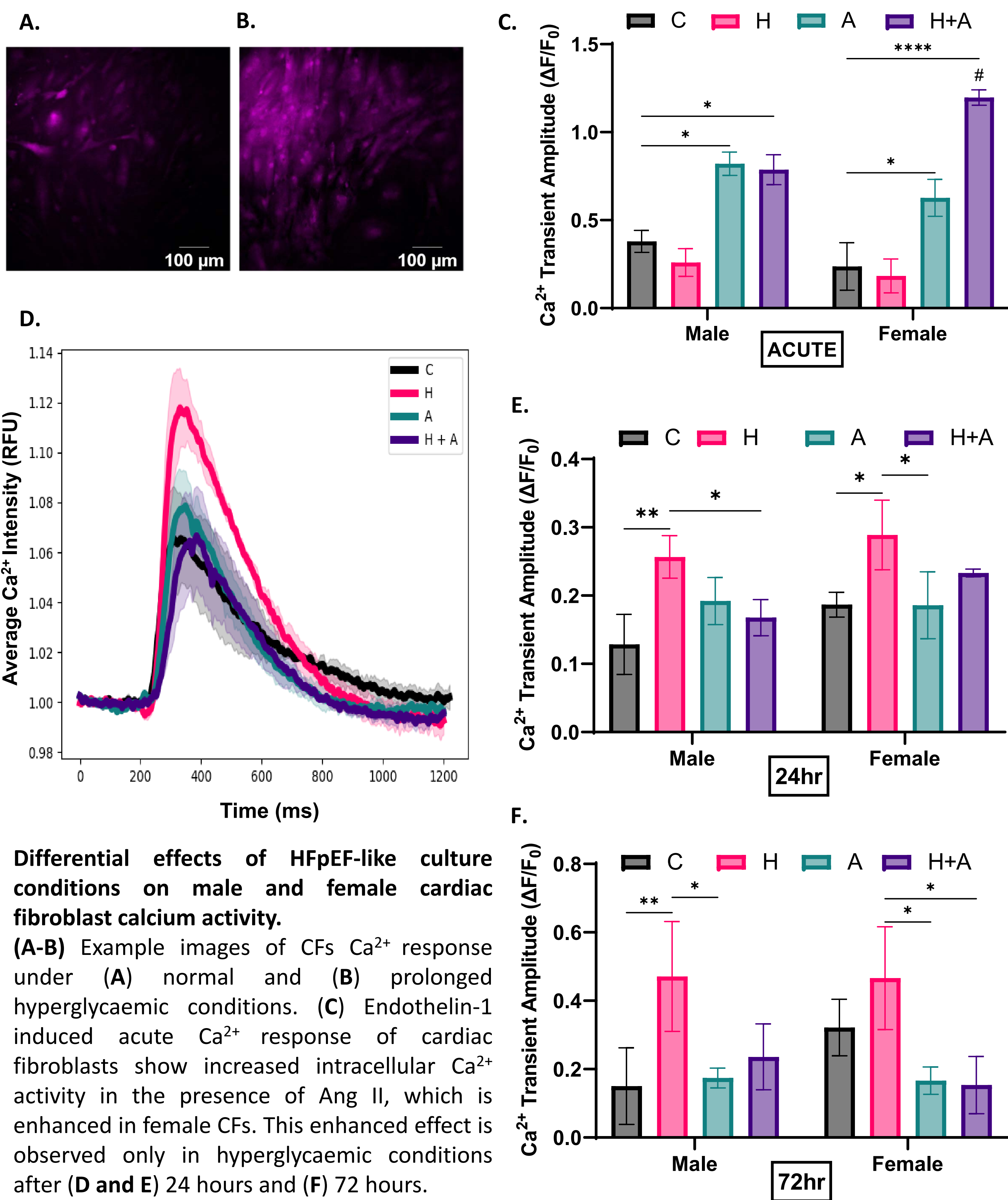
### Aims of study:

- To evaluate the Ca<sup>2+</sup> response of CFs in conditions mimicking diabetes, hypertension, and HFpEF, *in vitro*.
- To assess the impact of sex on the function of CFs.
- To assess the influence of cardiac fibroblasts on the function of cardiac myocytes, under similar pathological conditions.

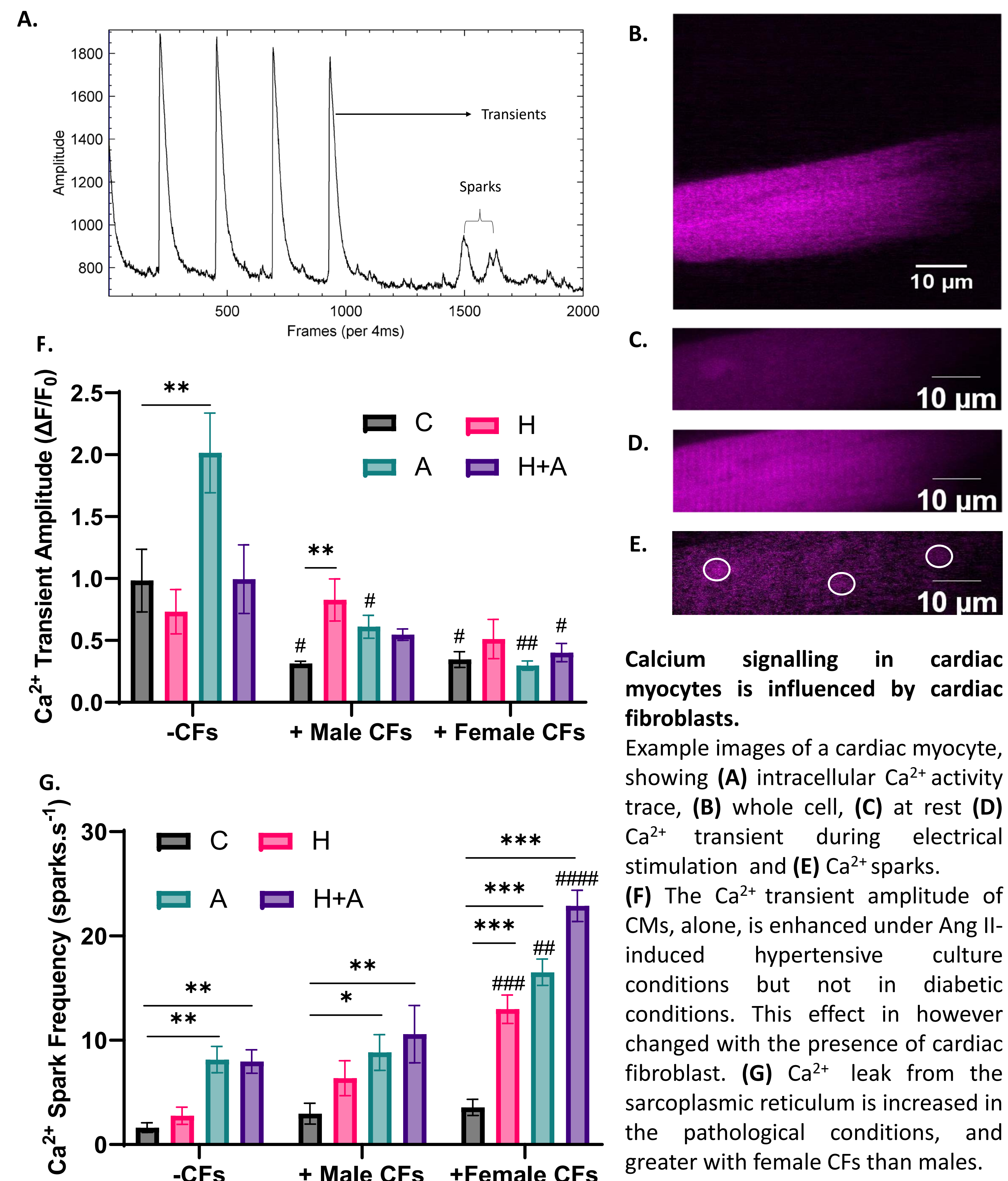
## 2. METHODS



## 3. Ca<sup>2+</sup> SIGNALLING IN CARDIAC FIBROBLASTS



## 4. Ca<sup>2+</sup> SIGNALLING IN CARDIAC MYOCYTES



## 5. SUMMARY

### Findings suggest that:

- Ca<sup>2+</sup> response in CFs is enhanced in *in vitro* diabetic and hypertensive conditions, relative to time.
- Cardiac fibroblasts influence the electrophysiology of cardiac myocytes, *in vitro*.
- The Ca<sup>2+</sup> activity of CFs and its influence on the physiology of CMs is sex specific.

### Future studies:

- What happens to the SR content in these cellular models of pathology?
- What factors drive intercellular communication by both cell types, in cardiomyopathy?
- How do fatty acids influence these cellular interactions, as seen in obese hearts?

## 6. REFERENCE, ACKNOWLEDGMENT and CONTACT

- Lejeune S, Roy C, Slimani A, Pasquet A, Vancaeynest D, Vanoverschelde JL, Gerber BL, Beauloye C, Pouleur AC. Diabetic phenotype and prognosis of patients with heart failure and preserved ejection fraction in a real life cohort. Cardiovascular diabetology. 2021 Dec;20:1-2.
- Sweeney M, Corden B, Cook SA. Targeting cardiac fibrosis in heart failure with preserved ejection fraction: mirage or miracle?. EMBO molecular medicine. 2020 Oct 7;12(10):e10865.

SCAN ME

