BS Cos A Progerin-inducible human induced pluripotent stem cell line to study cardiac cell aging

XII JORNADA DE JÓVENES INVESTIGADORES/AS DEL 13A

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INTRODUCTION



Heart aging is poorly characterized **Heart disease**: one of the most common causes of death **Clinical Trials:** Unexpected cardiotoxicity

(CTX) of drugs Arrhythmia risk (prolonged) QT/QTc interval)

Drugs needed

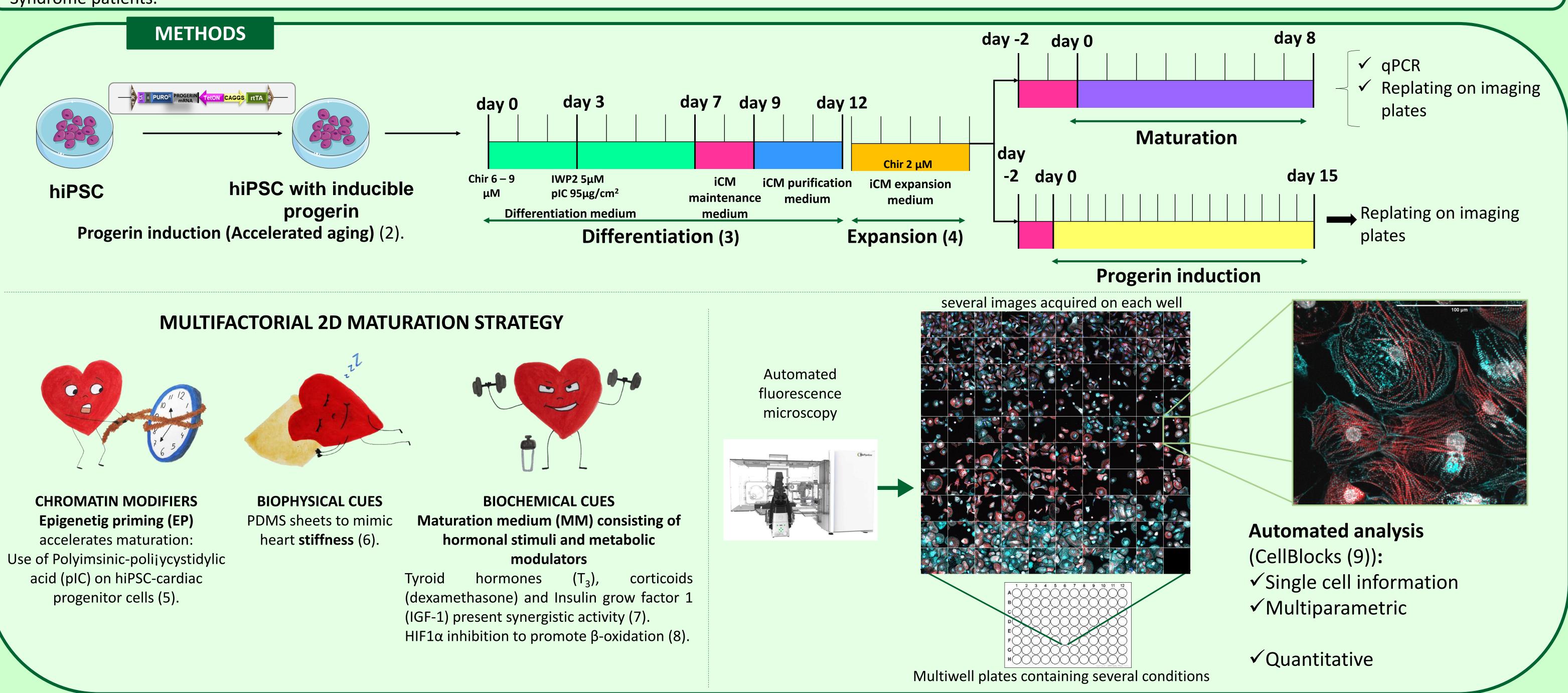
In vitro: hiPSC-derived cardiomyocytes (iCM) **HUMAN-BASED TOOLS** In silico: electrophysiology

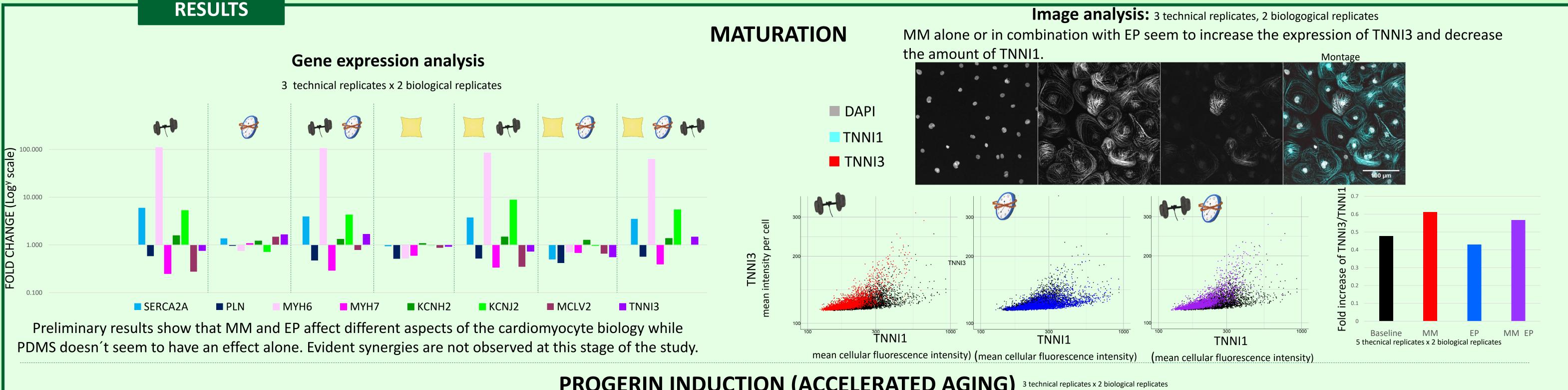
Better undertanding of cardiac aging molecular bases

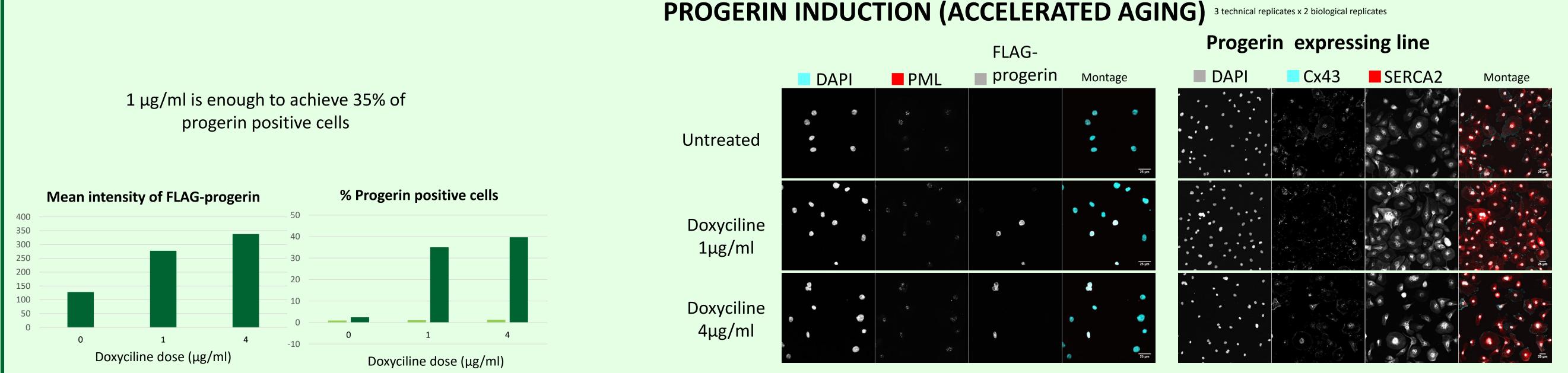
✓ Human-based platforms to study agerelated CTX

GOAL

The general goal is to establish a human cardiac cell aging model that enables the study of its molecular basis and that constitutes a platform for age-related cardiotoxicity assessments. Specific goals are: (i) to obtain mature cardiomyocytes from human induced pluripotent stem cells & (ii) characterize a model based in the accelerated aging effect of progerin observed Huntchinson Gilford Progeria Syndrome patients.







Stainings for several markers have been optimized, imaged and are now being quantified along with morphologycal features

CONCLUSIONS

Non edited line

- ✓ The maturation media seems to achieve improvements in both the sarcomeres structure of the iCMs as well as in the expression of genes related with electrophysiology and calcium handling, of great importance for the cardiac function.
- ✓ For some markers, there seems to be high variability among biological replicates. More replicates are needed.
- Our generated line is able to induce the expression of progerin in the iCMs, although suboptimal, and the amount of progerin seems to increase with higher doses of doxycycline.

Progerin expressing line

✓ Although many markers related with aging have been optimized, a more extensive study is needed to fully characterize the effects of progerin induction on cardiomyocytes and ideally in the mature ones.

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DAPI

Lamin B1 Hek9me2,3

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