

# Nanocarriers-Mediated Modulation of Mechanosensitive Pro-Fibrotic Pathway in Myocardium

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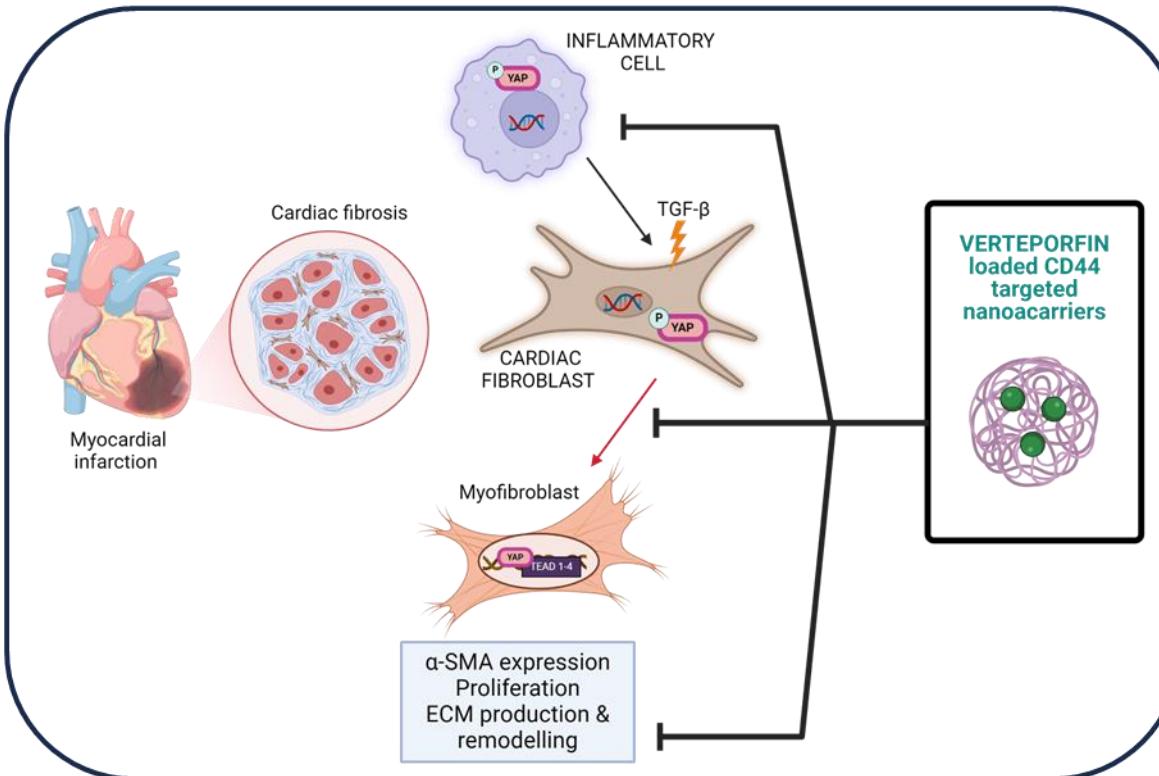
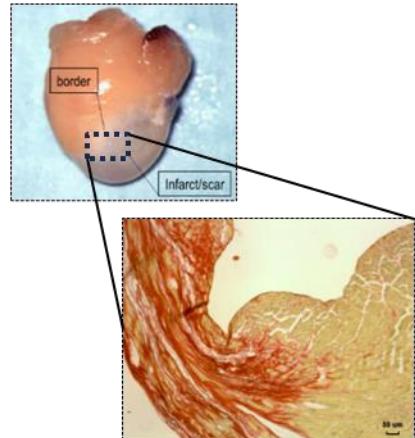
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## Maladaptive myocardial remodeling

from prolonged ischemia is an early hallmark of heart failure.



AIM

Development of a cell-specific targeting of the YAP-dependent pathway by CD44 targeted NPs

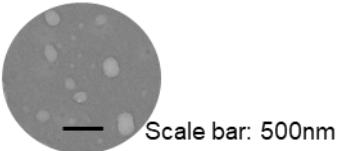
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## Verteporfin loaded NPs

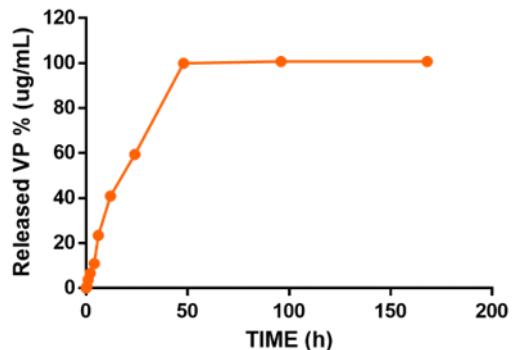
Hyaluronic acid -TPP

Chitosan \*HCl  
Verteporfin

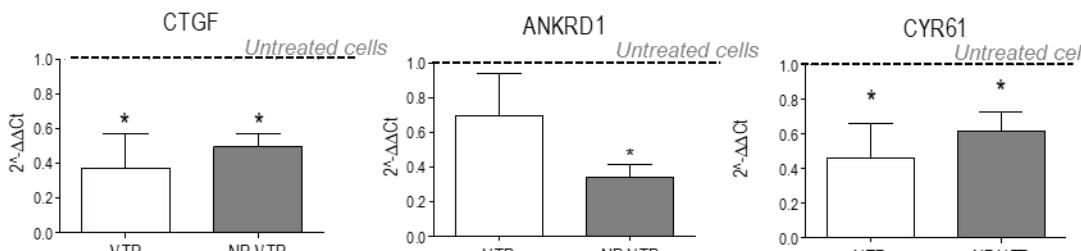
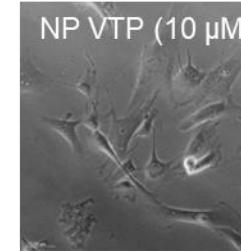
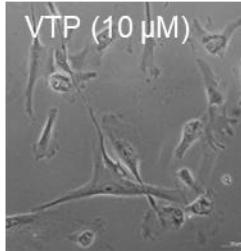
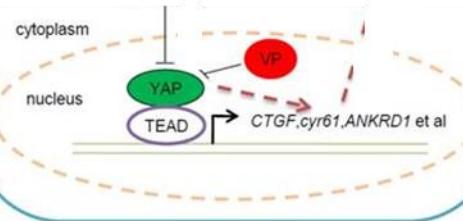
Size: 218 nm  
PDI: 0.19  
PotZ: -16 mV



MEAN ENCAPULATION EFFICIENCY =  $82 \pm 3\%$   
DRUG LOADING =  $13.3 \pm 4.7\%$

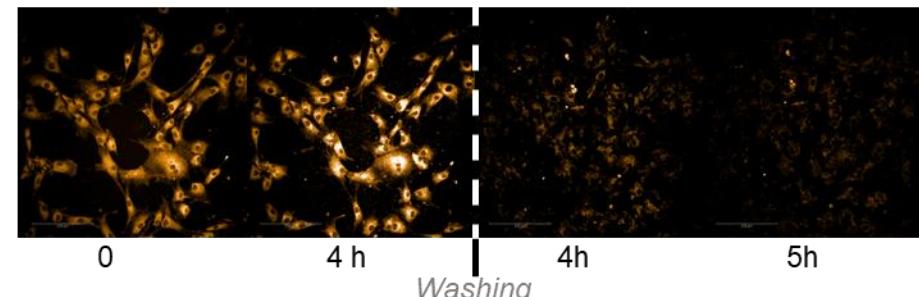


## Delivery of VTP in human Cardiac Fibroblasts (hCFs)



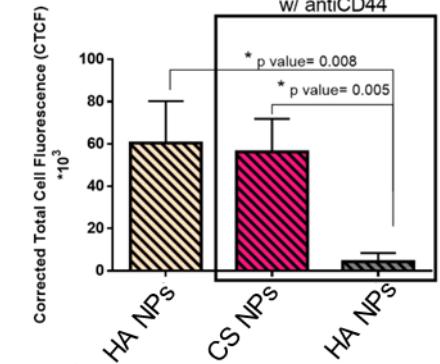
Reduction of the expression of YAP/TAZ target genes

## Live monitoring of NPs uptake in hCFs

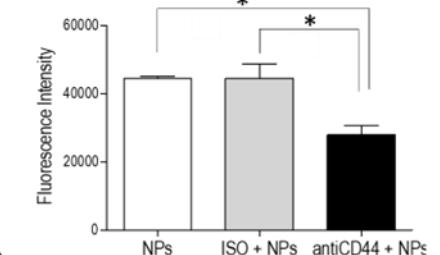
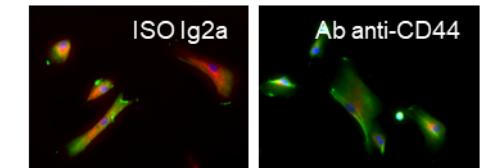


## CD44 blocking

### Human Mesenchymal Stem Cells



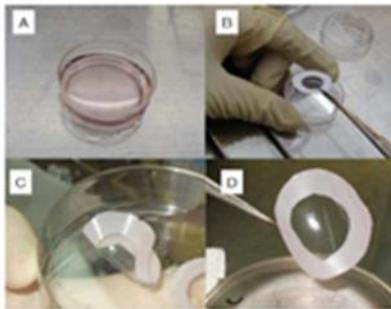
### Human Cardiac fibroblasts



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## 3D cell culture

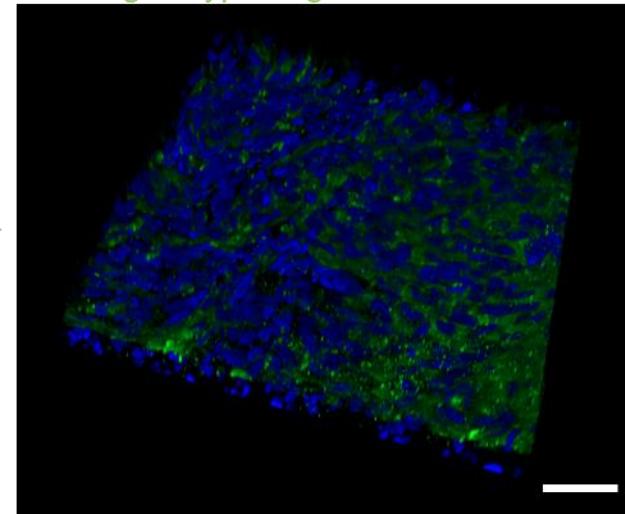
✓ Cell sheet fabrication



✓ Cell sheet characterization

Nuclei: blue

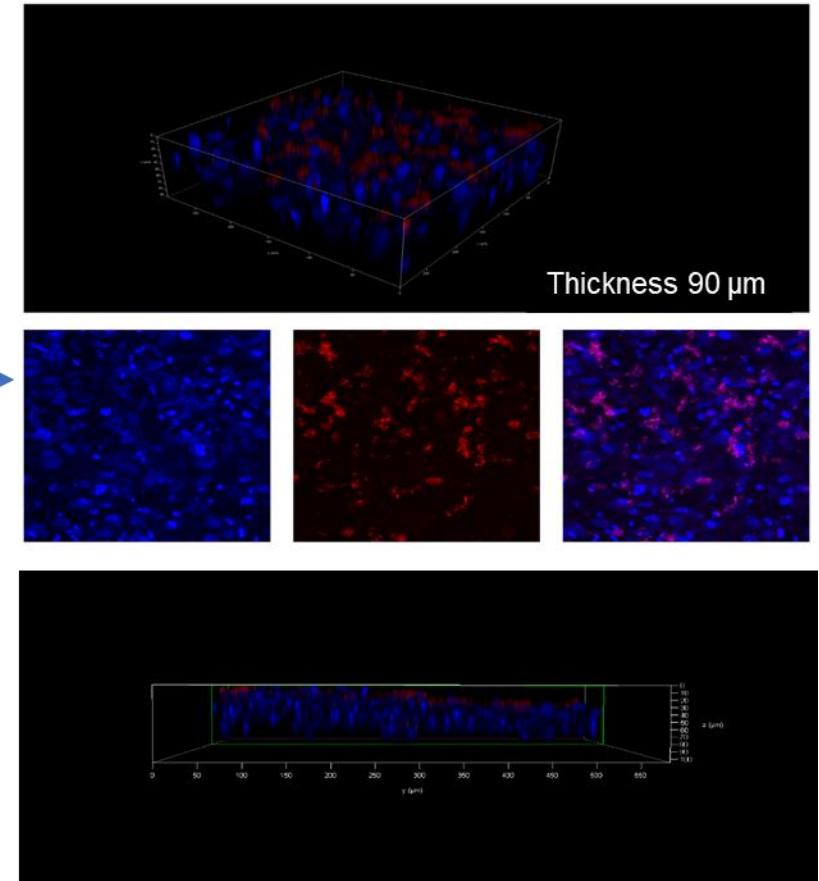
Collagen type I: green



Scale bar=100  $\mu$ m

After 24h HA/CS NPs are in the apical region of the cell sheets reaching a maximum depth of 40  $\mu$ m.

✓ Treatment with HA/CS NPs



# Acknowledgements

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