

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

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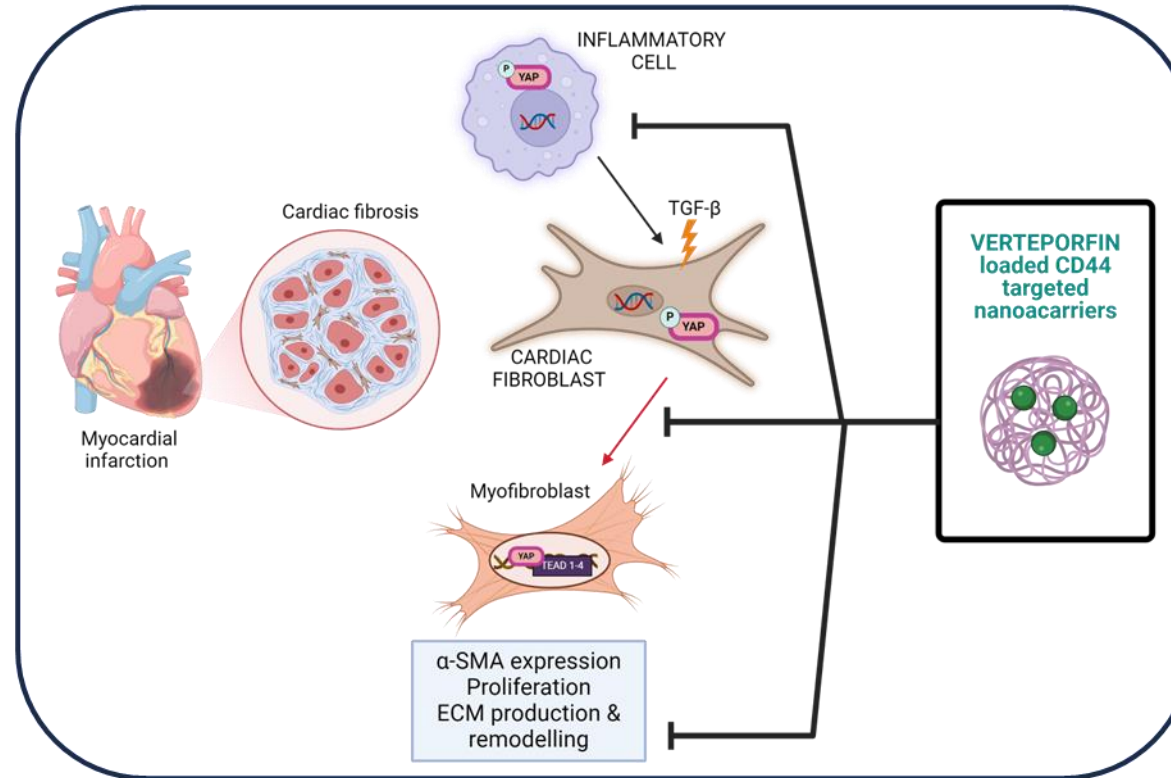
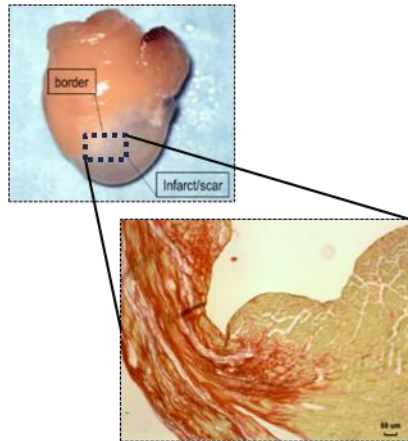
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## Maladaptive myocardial remodeling

from prolonged ischemia is an early hallmark of heart failure.



## AIM

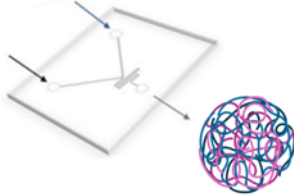
Development of a cell-specific targeting of the YAP-dependent pathway by CD44 targeted NPs

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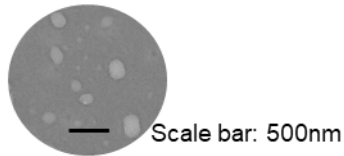
## Verteporfin loaded NPs

Hyaluronic acid -TPP

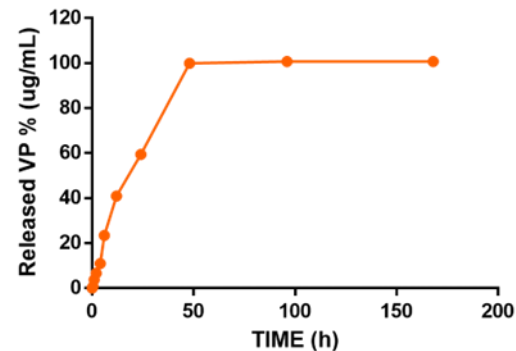
Chitosan \*HCl  
Verteporfin



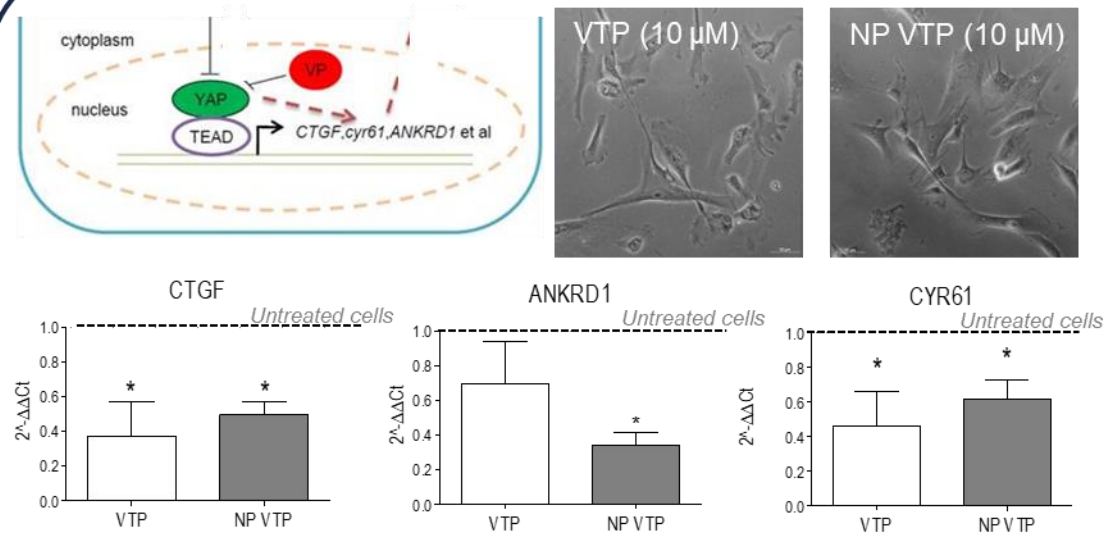
Size: 218 nm  
PDI: 0.19  
PotZ: -16 mV



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

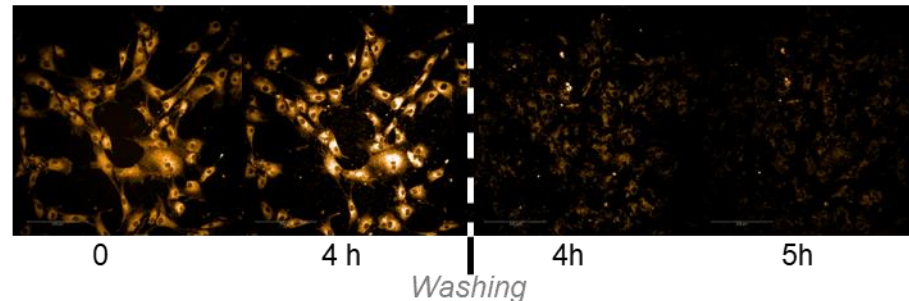


## Delivery of VTP in human Cardiac Fibroblasts (hCFs)



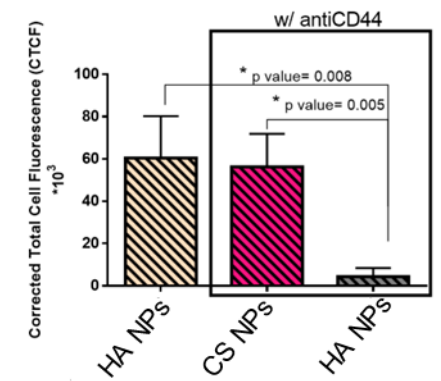
Reduction of the expression of YAPT/TAZ target genes

## Live monitoring of NPs uptake in hCFs

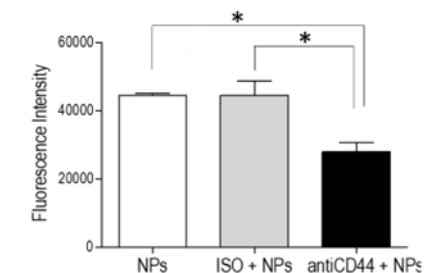
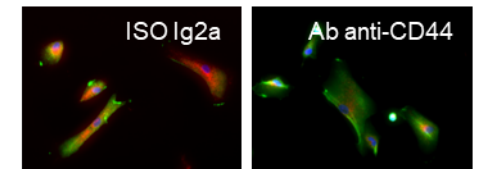


## CD44 blocking

Human Mesenchymal Stem Cells



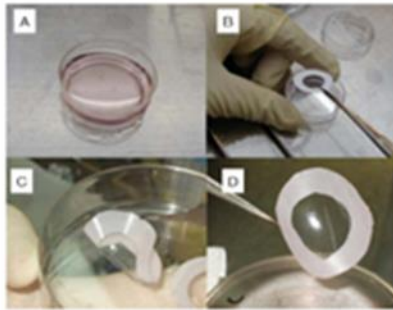
Human Cardiac fibroblasts



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## 3D cell culture

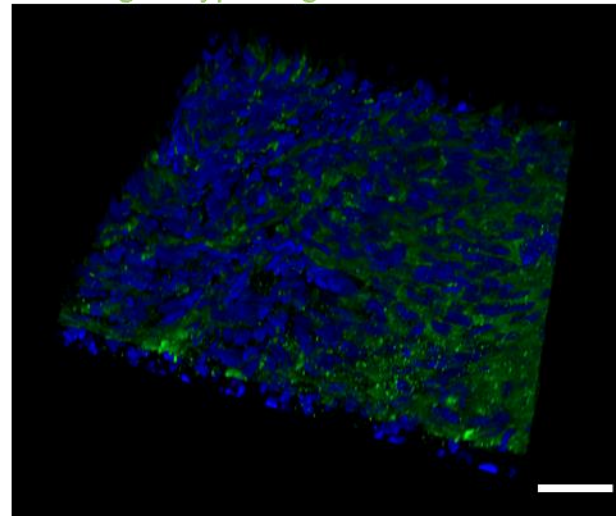
✓ Cell sheet fabrication



✓ Cell sheet characterization

Nuclei: blue

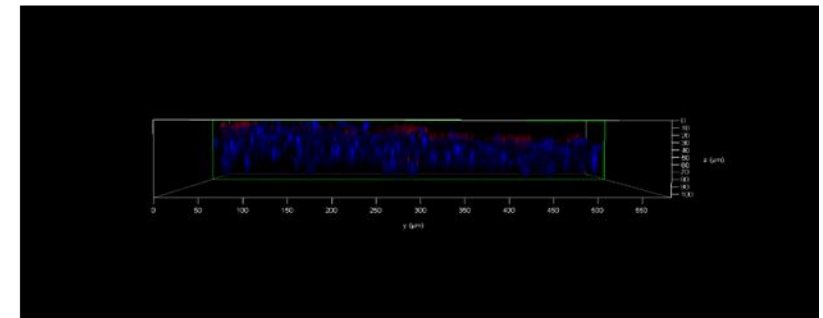
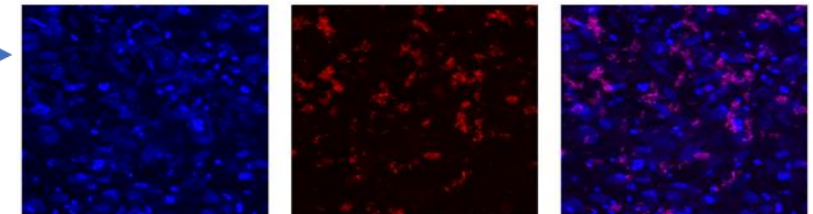
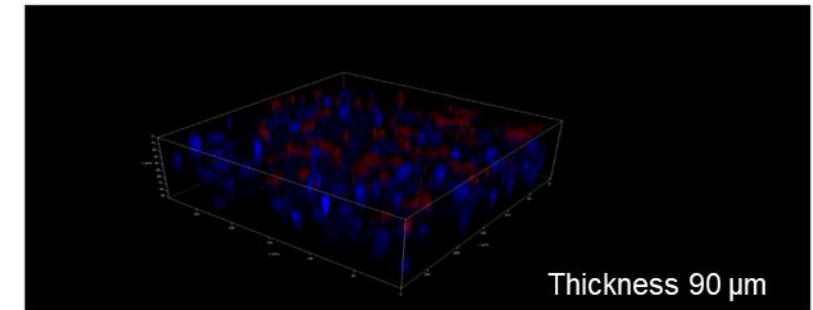
Collagen type I: green



Scale bar=100  $\mu\text{m}$

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

✓ Treatment with HA/CS NPs



# Acknowledgements



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Department of Drug Sciences



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Pharmaceutical Technology & Law



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