

# Nanomedicine and Nanoscale Delivery IV

**Pirfenidone-loaded polymeric micelles as an effective mechanotherapeutic to potentiate immunotherapy in mouse tumor models**

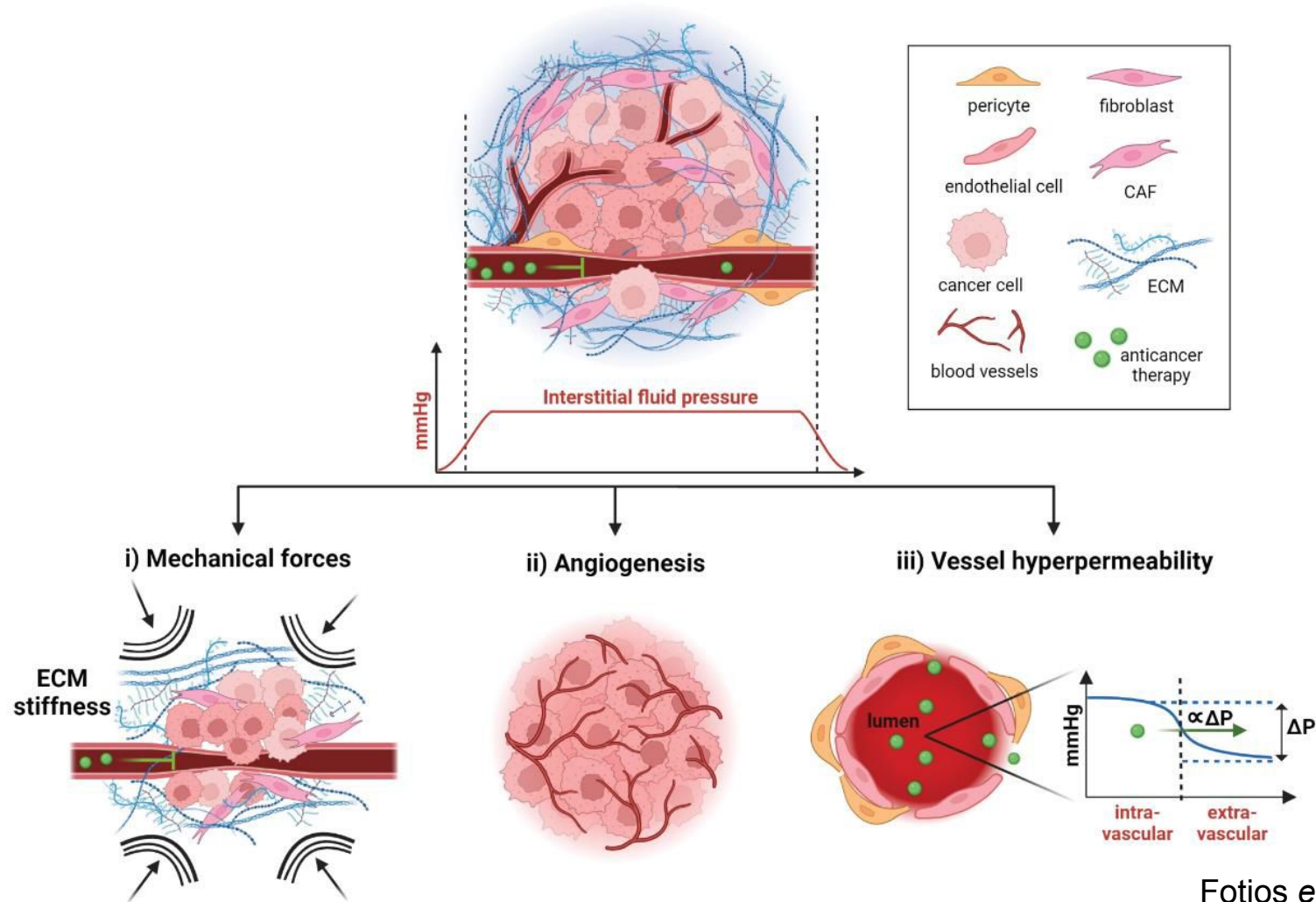
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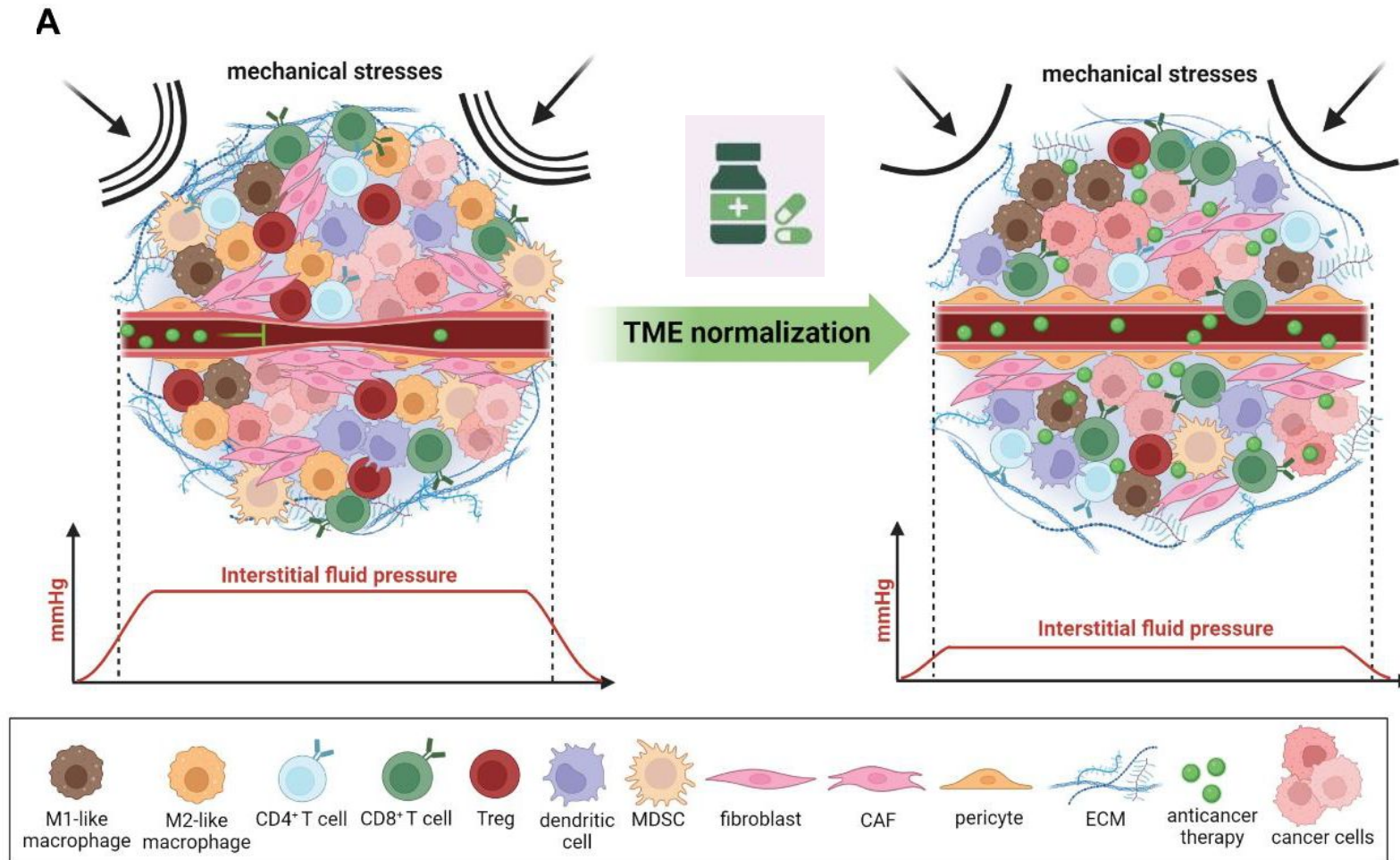


# Tumor mechanopathology compromises anti-tumor therapies



Fotios *et al.*, *Cell Reports Medicine*, 2024

# Mechanotherapeutics targeting tumor mechanopathology



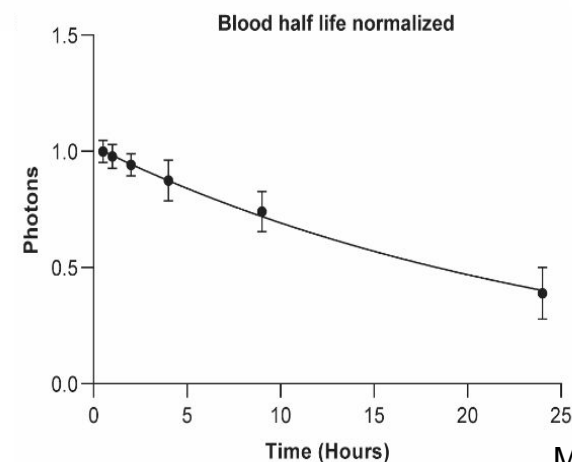
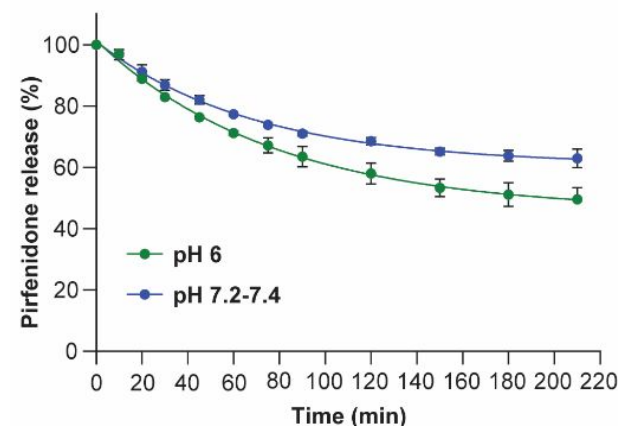
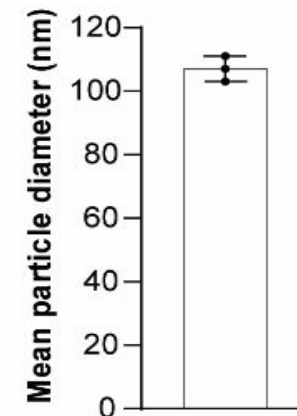
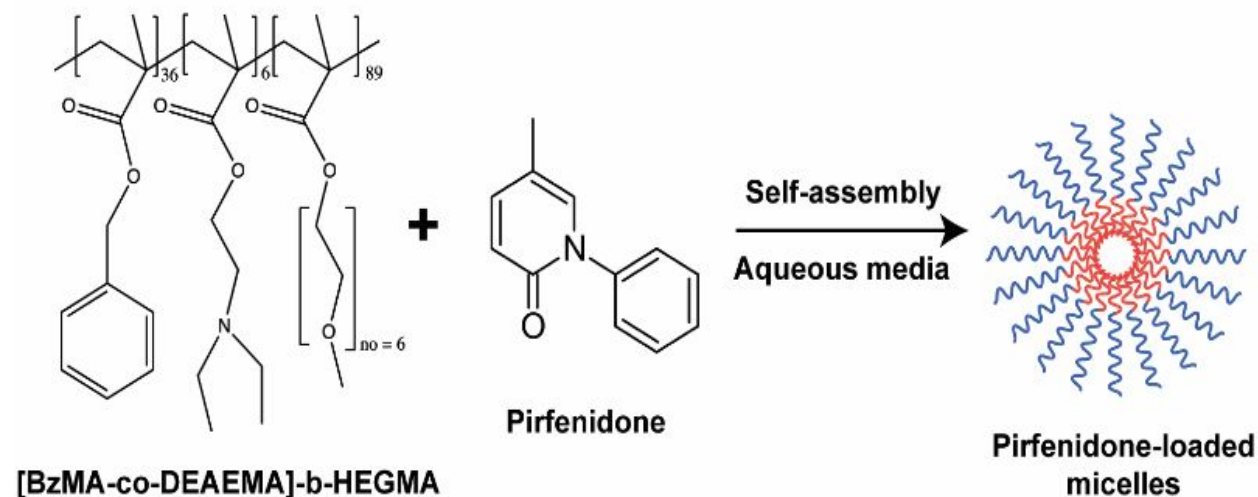
Fotios *et al.*, *Cell Reports Medicine*, 2024

# Mechanotherapeutics: Re-purposing common drugs



## Pirfenidone: antifibrotic drug

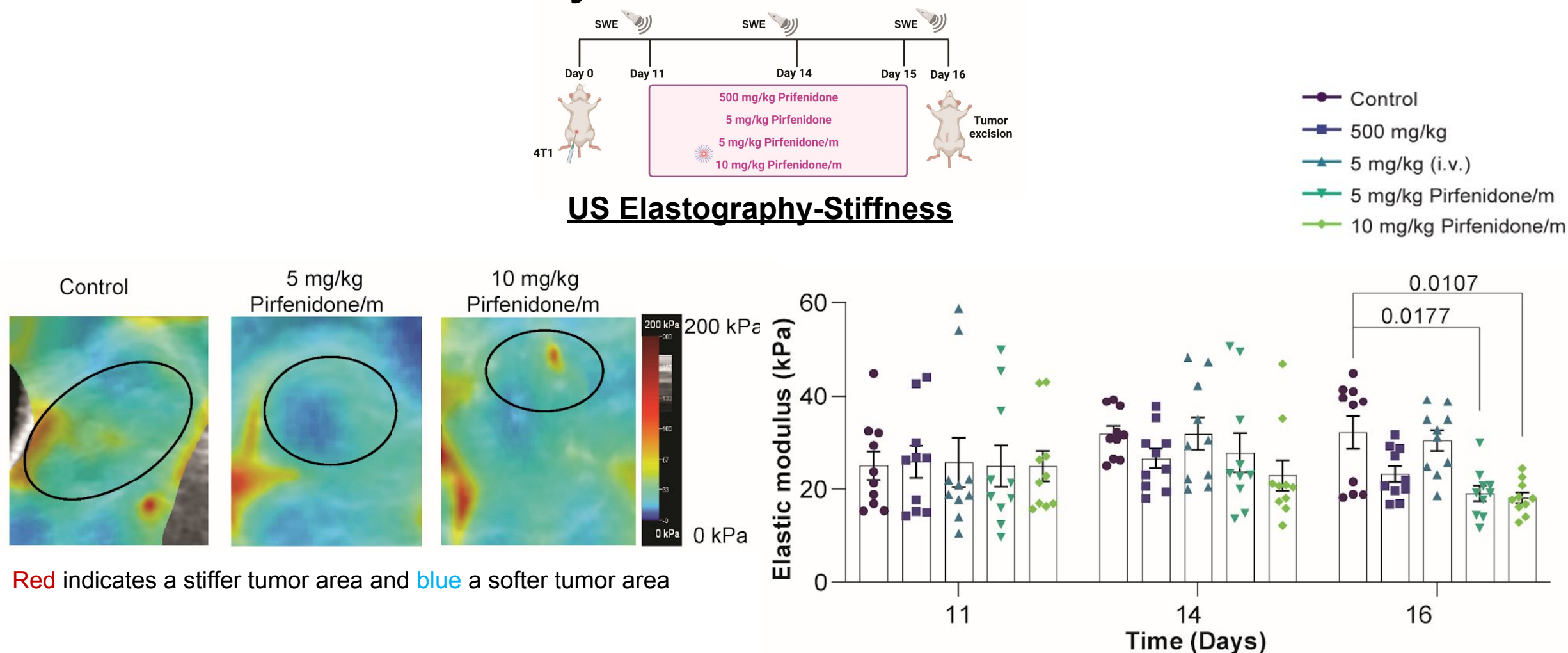
- Enhance tumor perfusion
- Increase the delivery of chemotherapy, immunotherapy & nanomedicines
- Induce anti-tumor immunity



Polydorou *et al.*, *Oncotarget*, 2017

Mpekris *et al.*, *ACS nano*, 2023

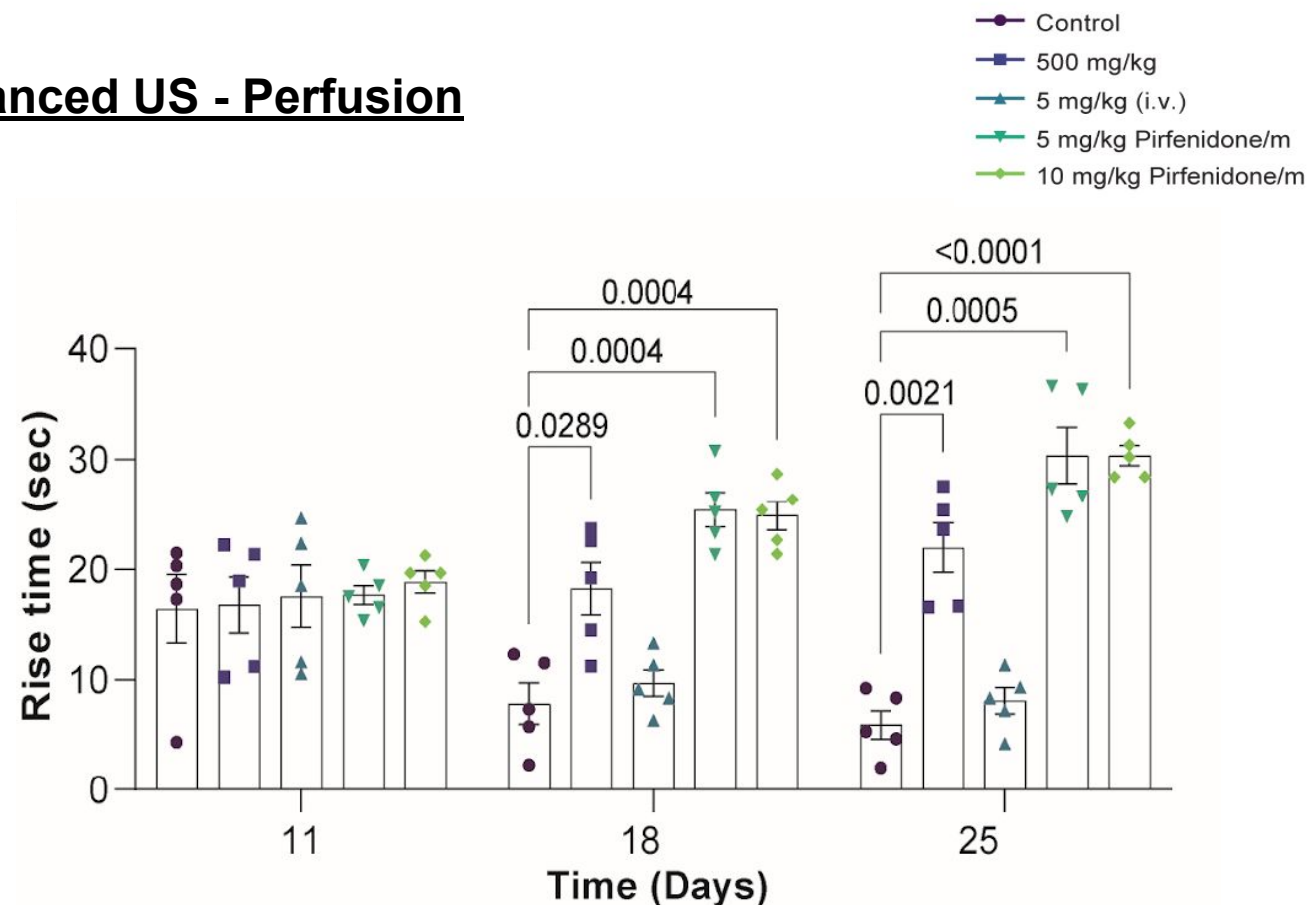
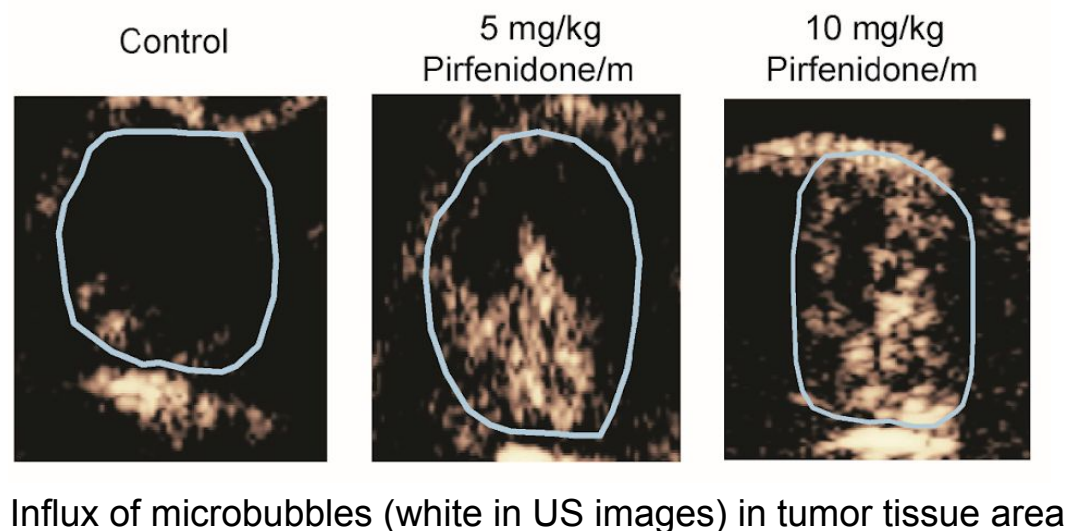
# Pirfenidone/m effectively normalize the TME in a 100-fold reduced dose



Mpekris *et al.*, *ACS nano*, 2023

# Pirfenidone/m effectively normalize the TME

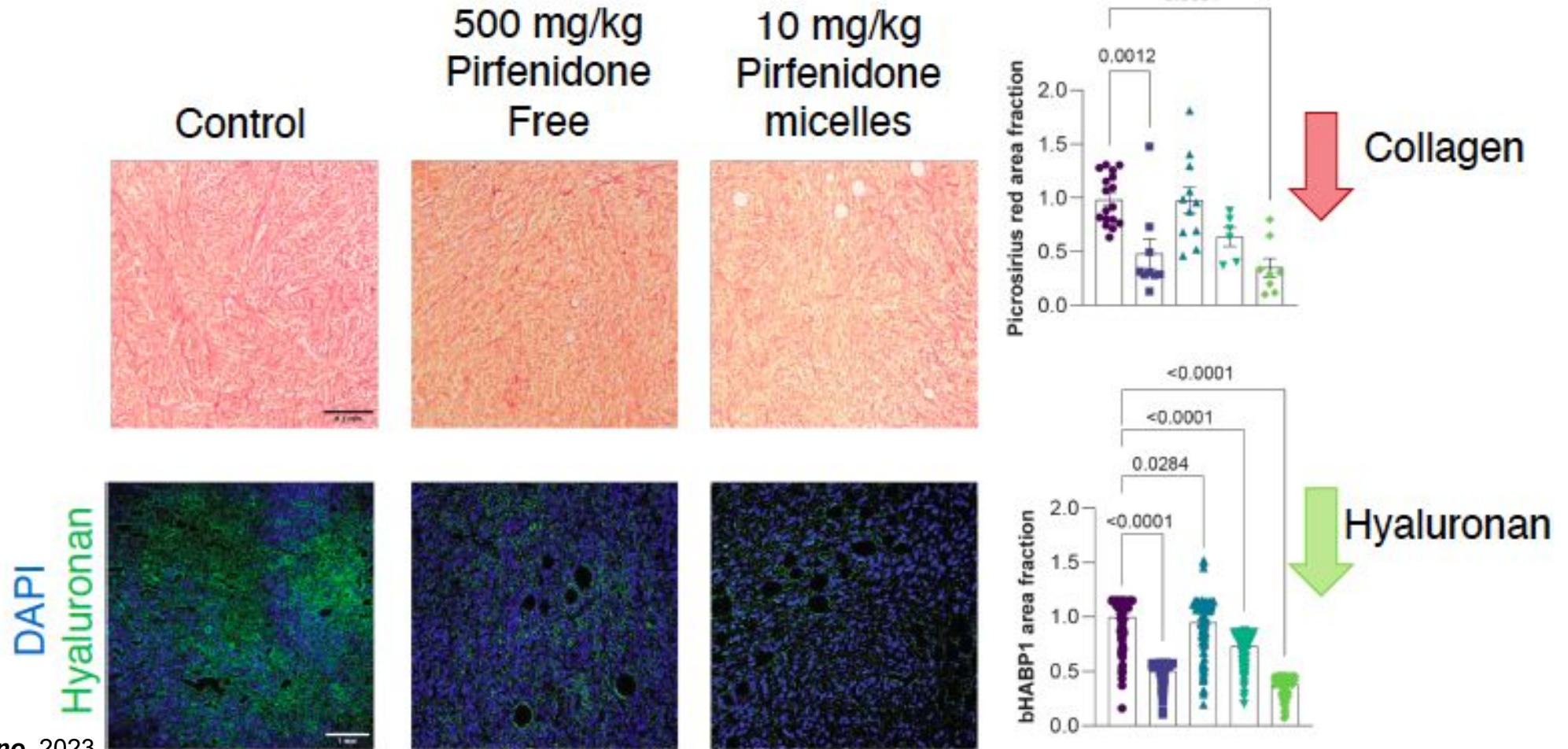
## Contrast enhanced US - Perfusion



Mpekris *et al.*, *ACS nano*, 2023

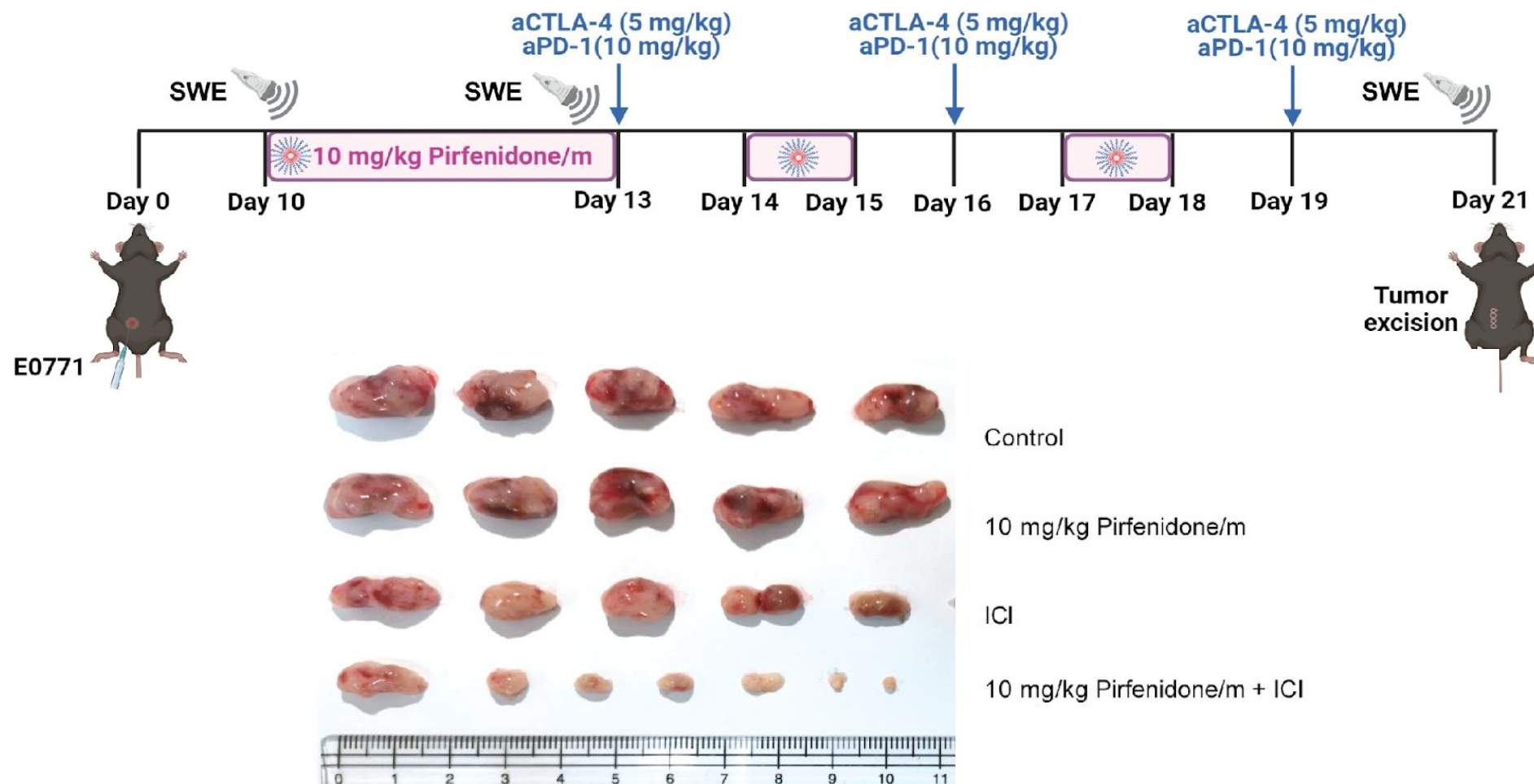
# Pirfenidone/m effectively normalize the TME

## Immunohistochemistry



Mpekris *et al.*, *ACS nano*, 2023

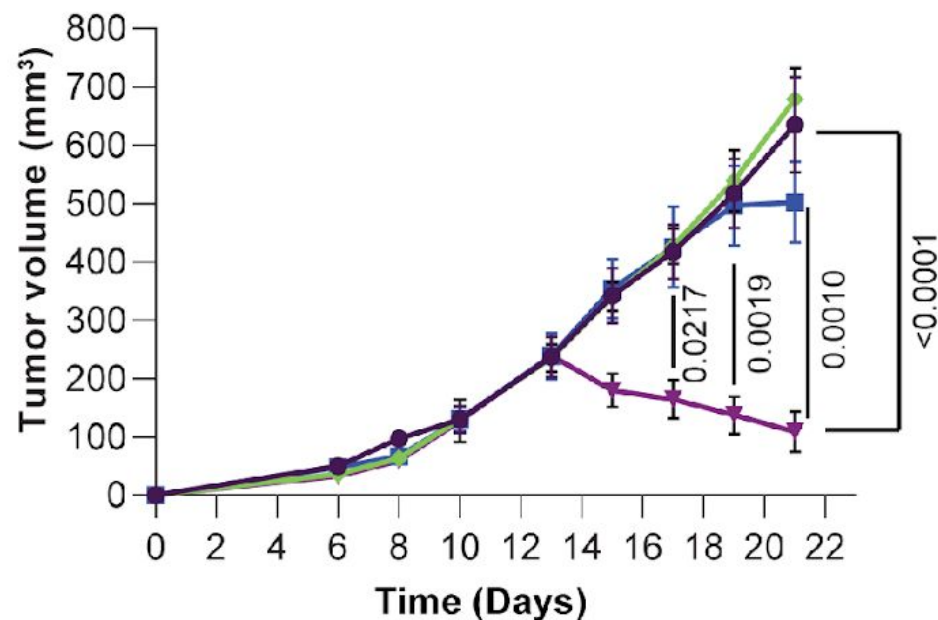
# Pirfenidone/m significantly enhance the effectiveness of immunotherapy



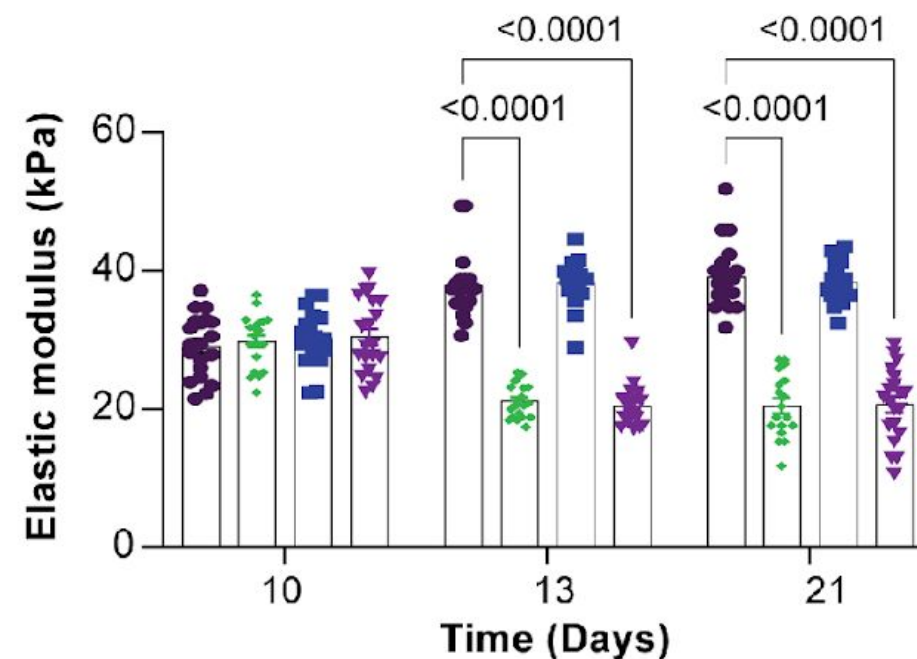
Mpekris *et al.*, *ACS nano*, 2023

# Pirfenidone/m significantly enhance the effectiveness of immunotherapy

## Tumor growth



## US Elastography-Stiffness

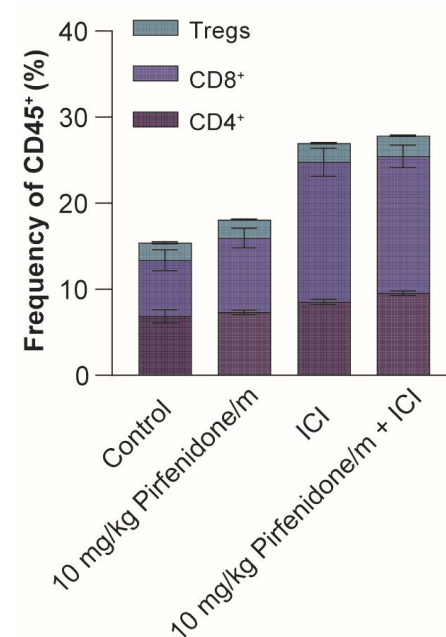
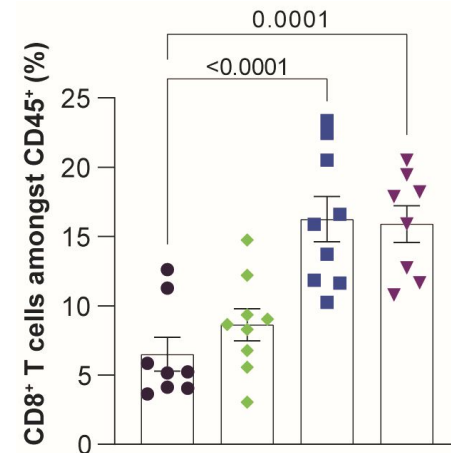
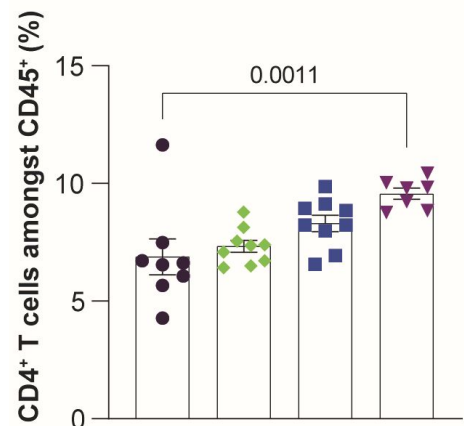


Mpekris *et al.*, *ACS nano*, 2023

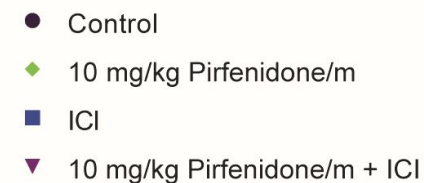
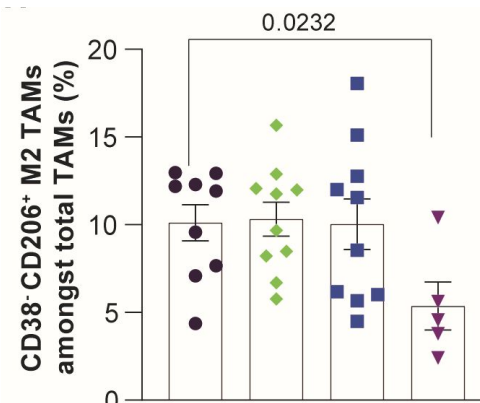
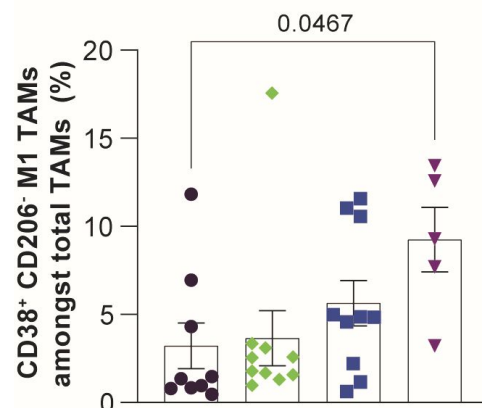
# Pirfenidone/m and ICI increase immune cells infiltration

## Flow Cytometry

### T-cells



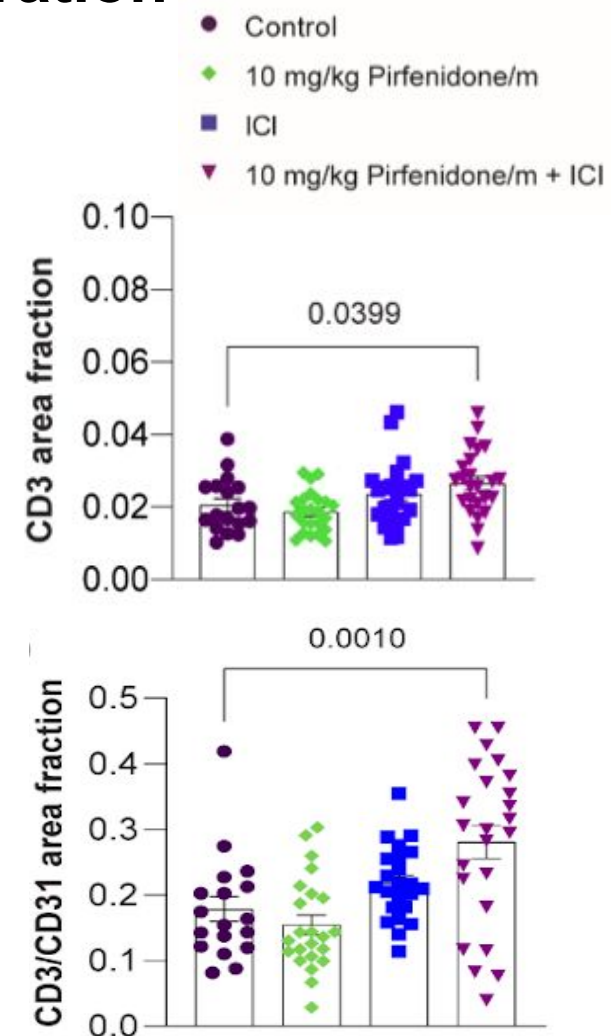
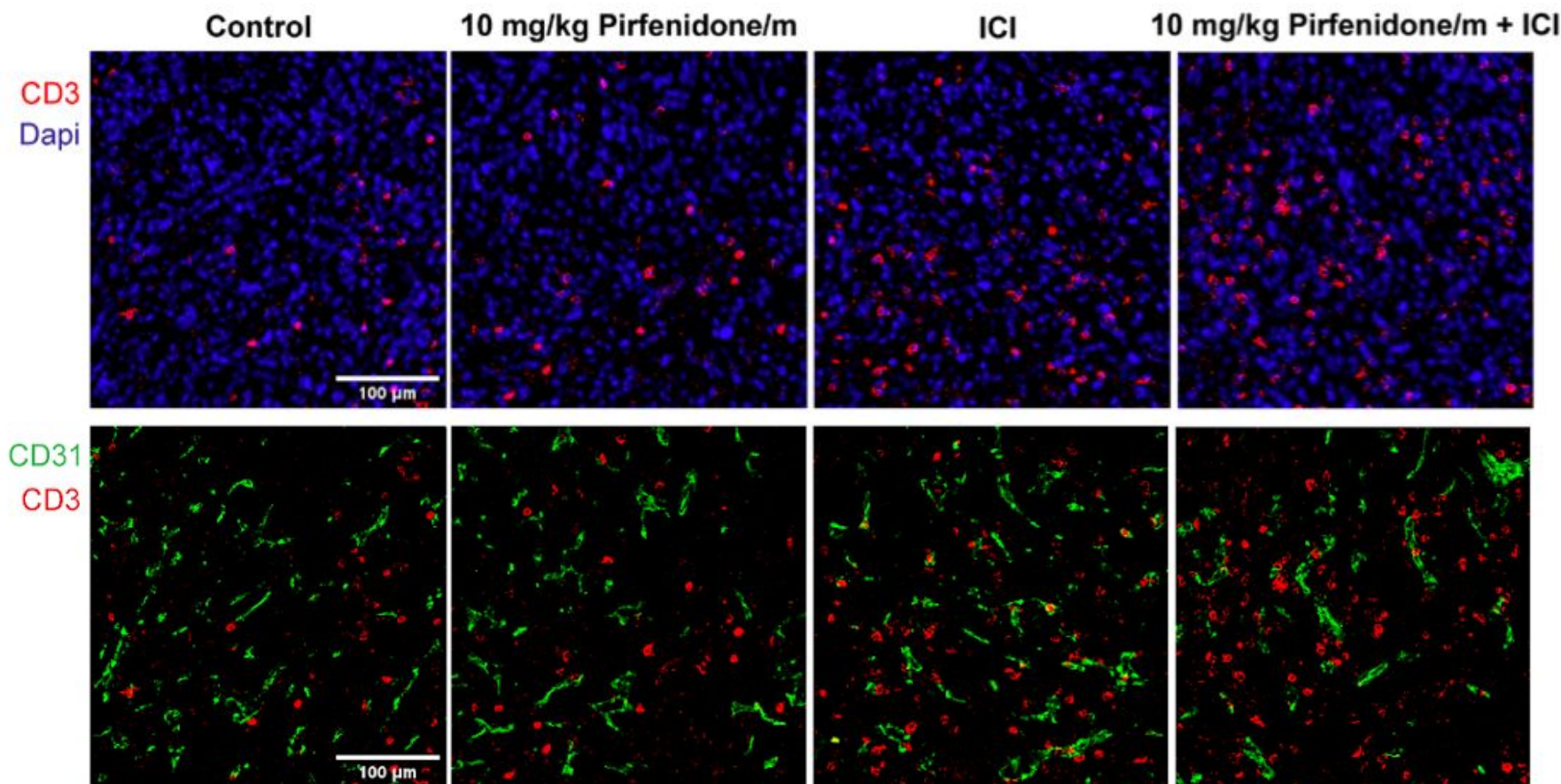
### Macrophages



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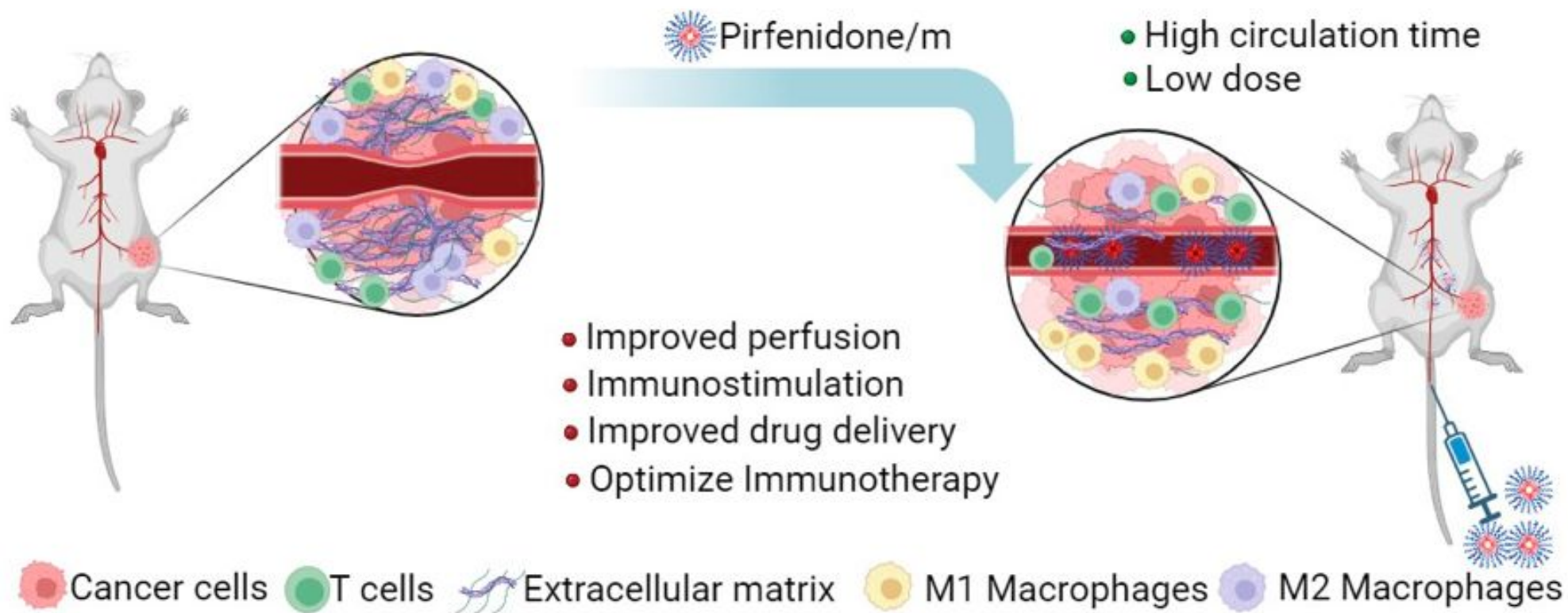
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## Immunohistochemistry

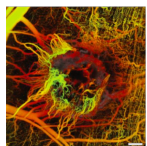


Mpekris *et al.*, *ACS nano*, 2023

# Summary



Mpekris *et al.*, *ACS nano*, 2023



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### Funding Sources



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RESEARCH  
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ERC Starting grand  
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