

Nanomedicine & Nanoscale delivery II

Kunal P. Pednekar



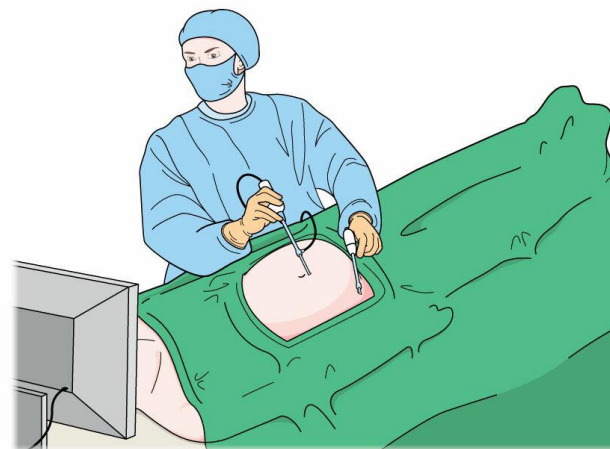
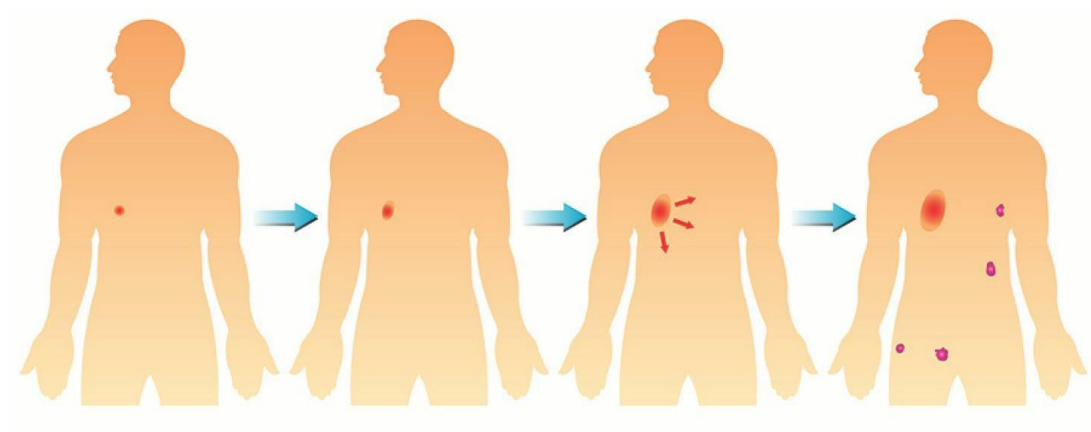
INTEGRATING
Delivery Science
ACROSS DISCIPLINES



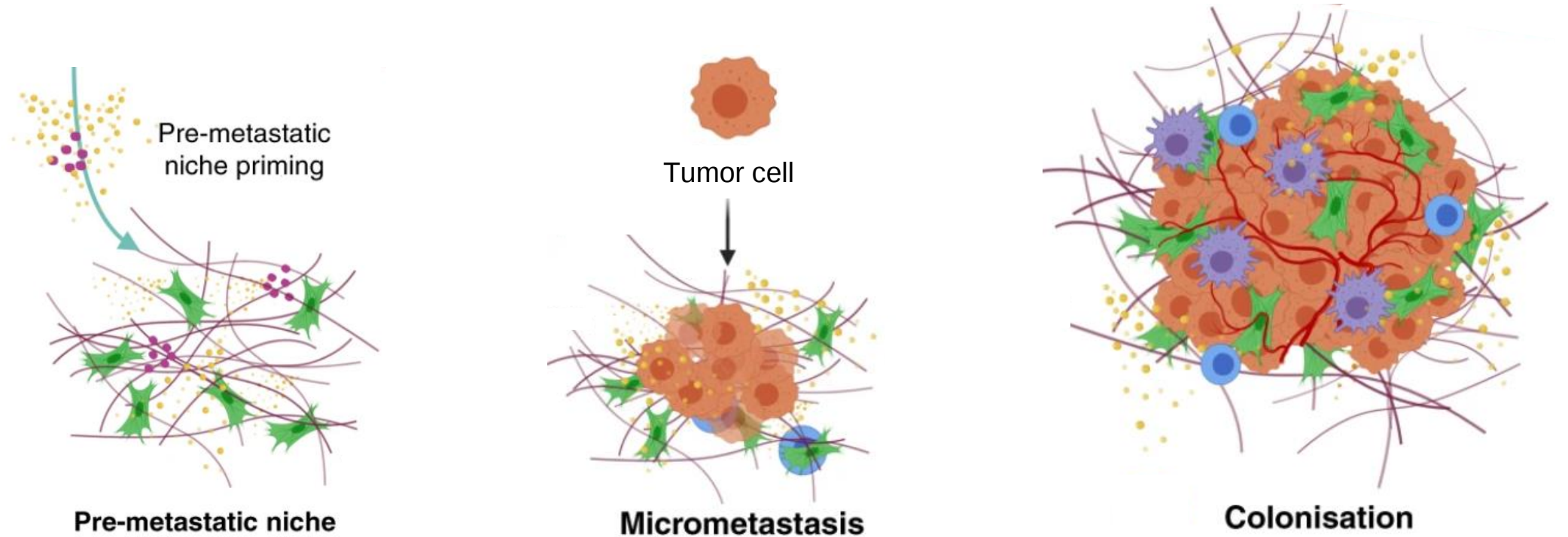
‘Tail-flipping’ nanoliposomes to target metastasis-associated macrophages in lung metastasis



Metastasis

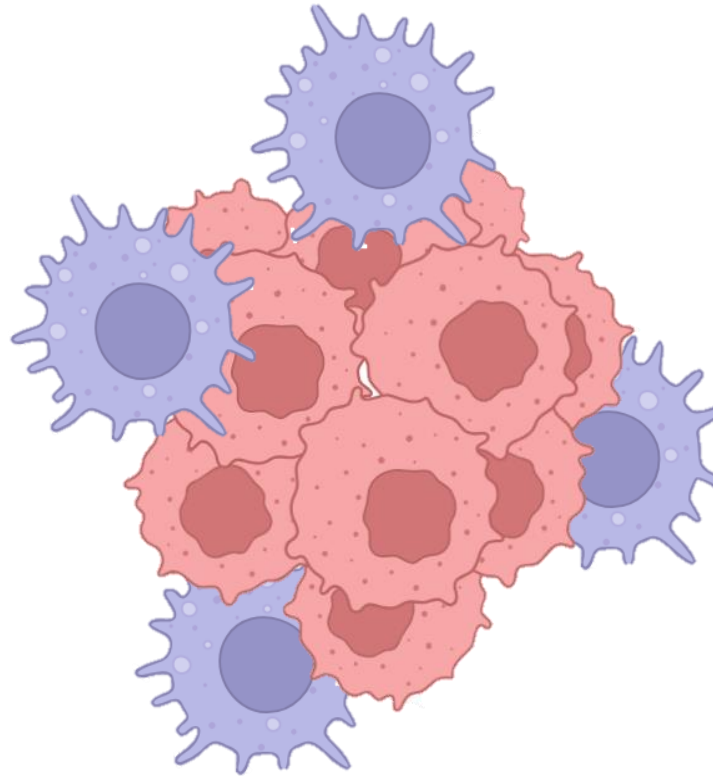


Metastatic cascade

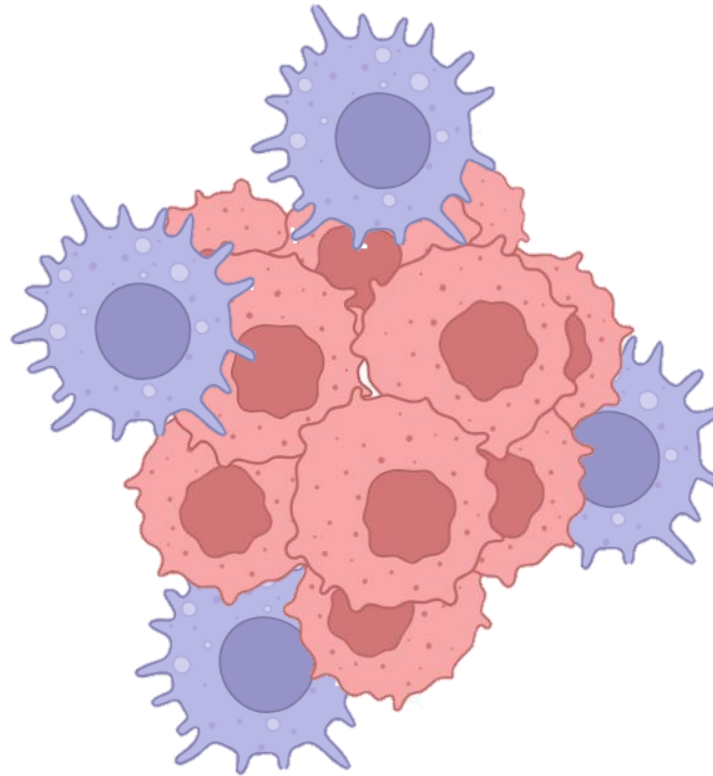
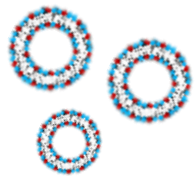
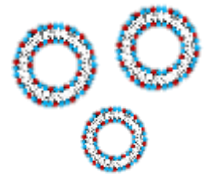


Boulter et. al., BJC, 2020

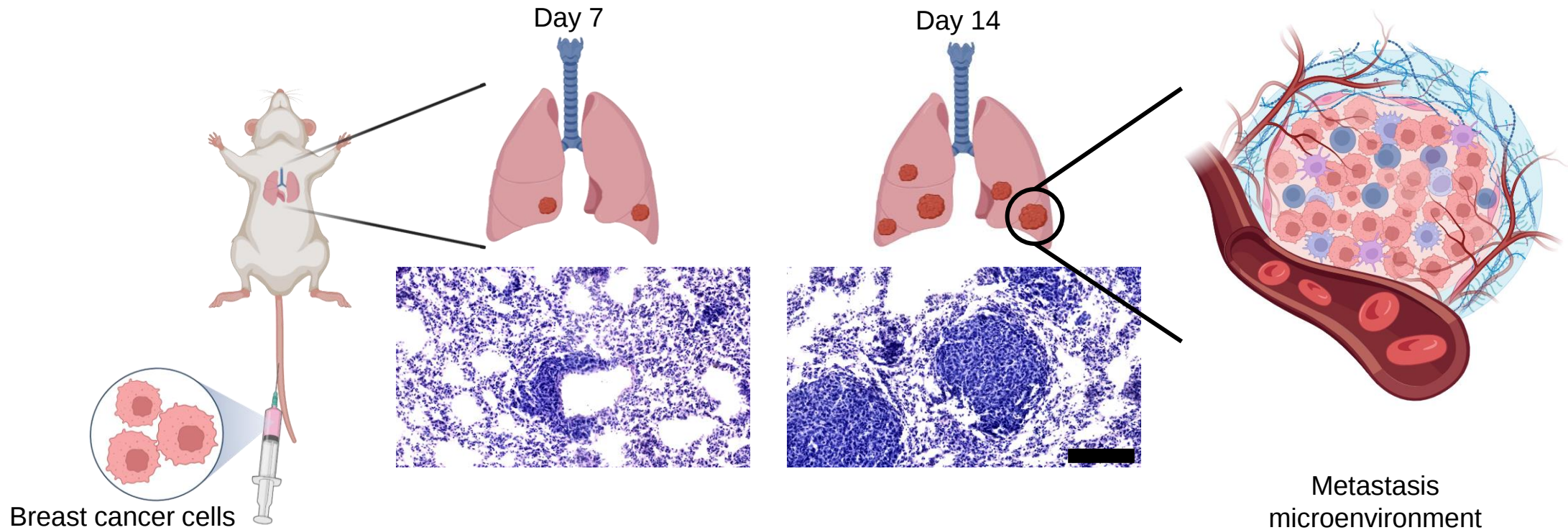
Aim of the study



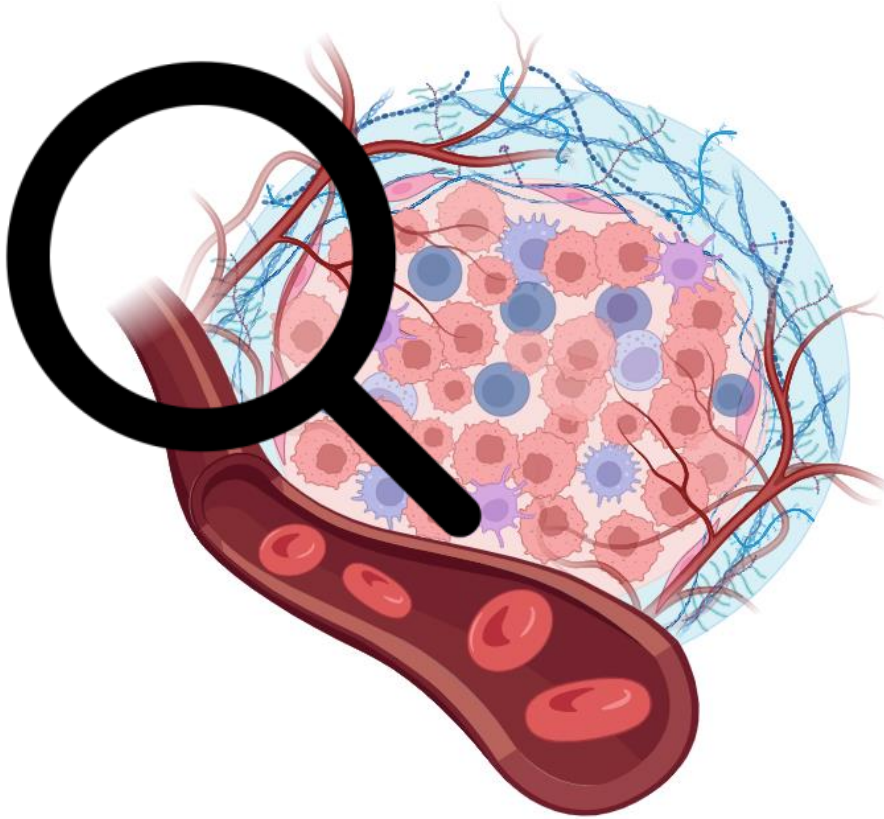
Aim of the study



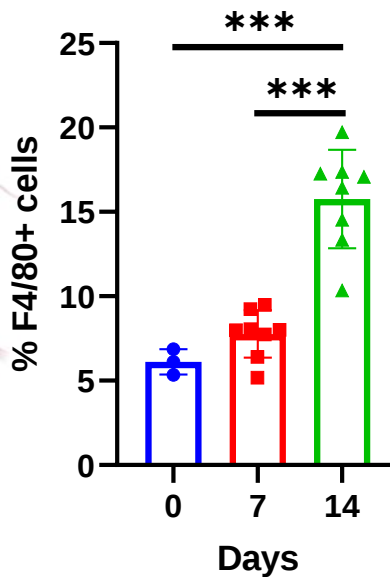
Metastasis microenvironment



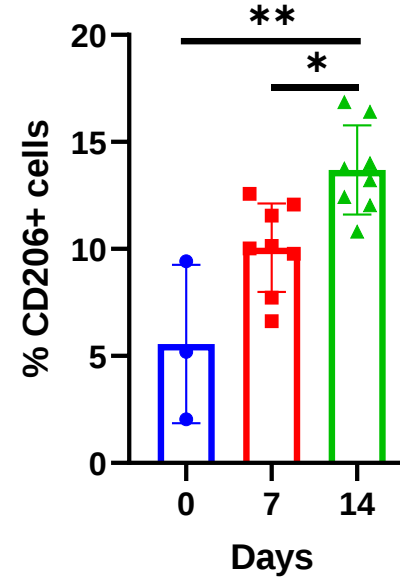
MAMs in the microenvironment



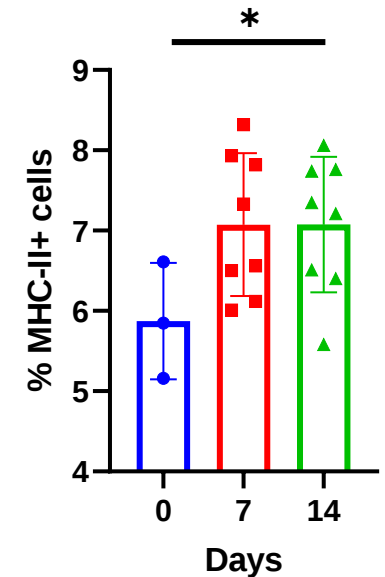
Total macrophages



M2-type MAMs

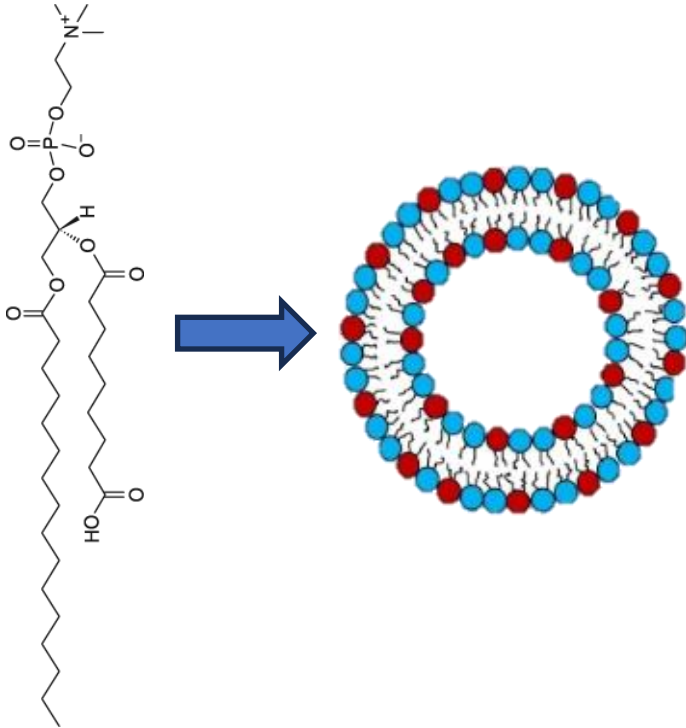


M1-type MAMs

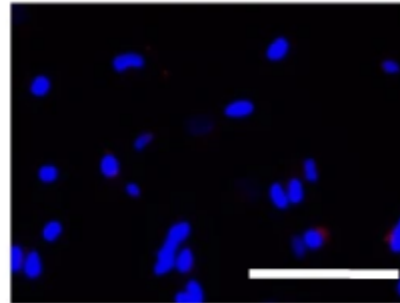


M2 targeting nanoliposomes

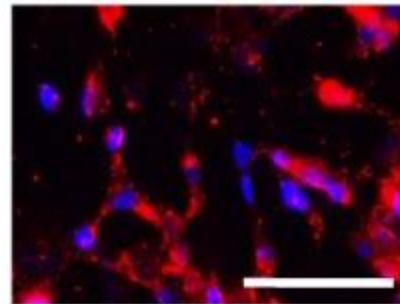
PAPC lipid structure



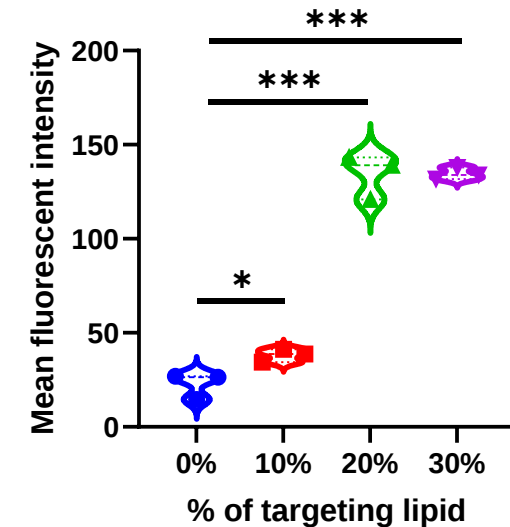
Non targeting liposomes



Targeting liposomes

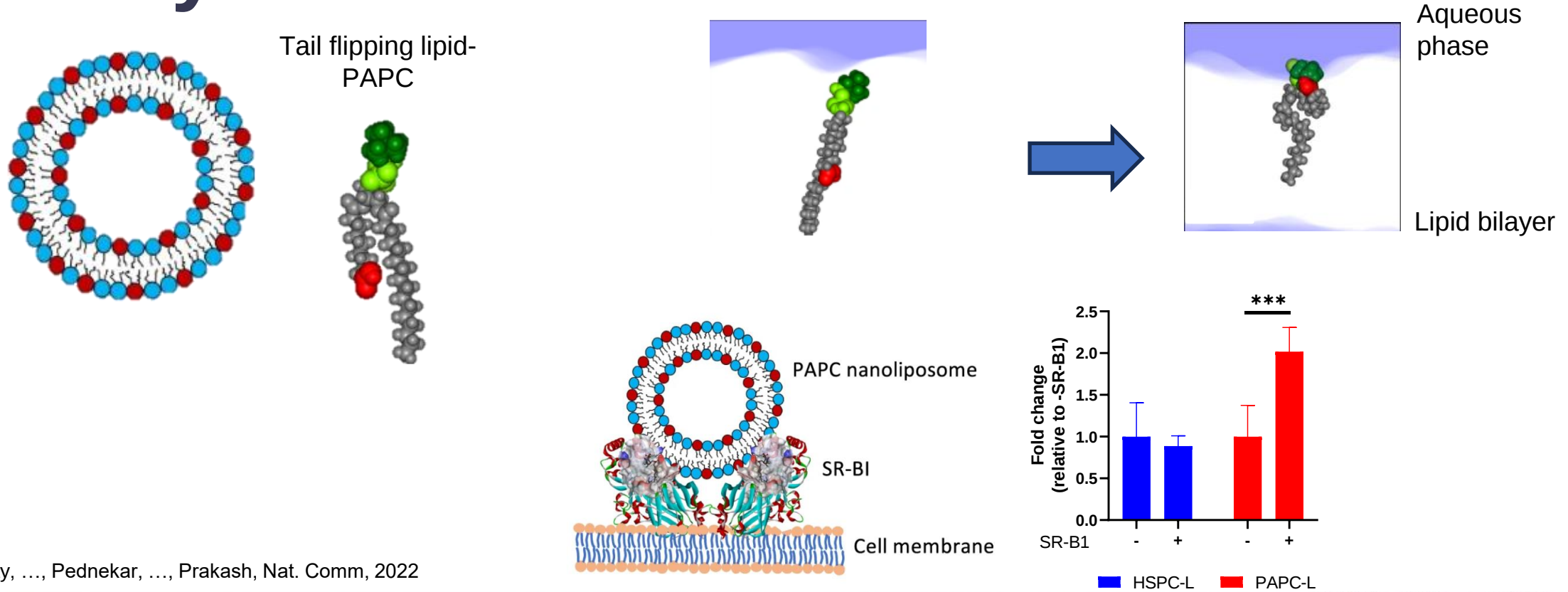


Uptake by TAMs



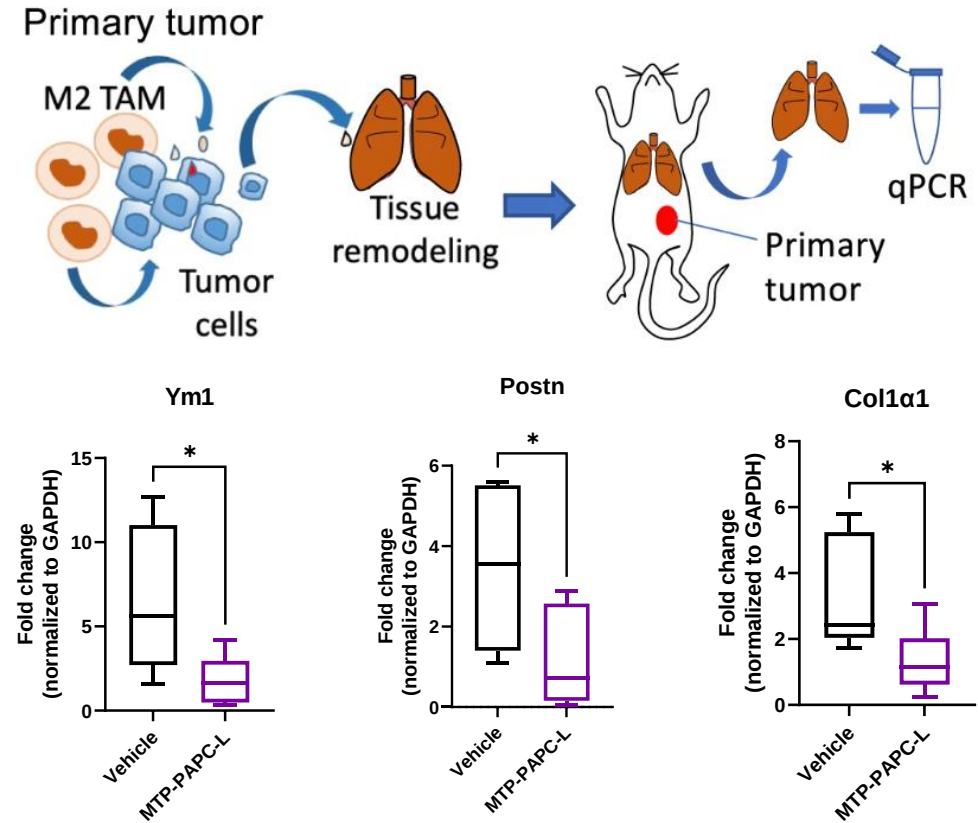
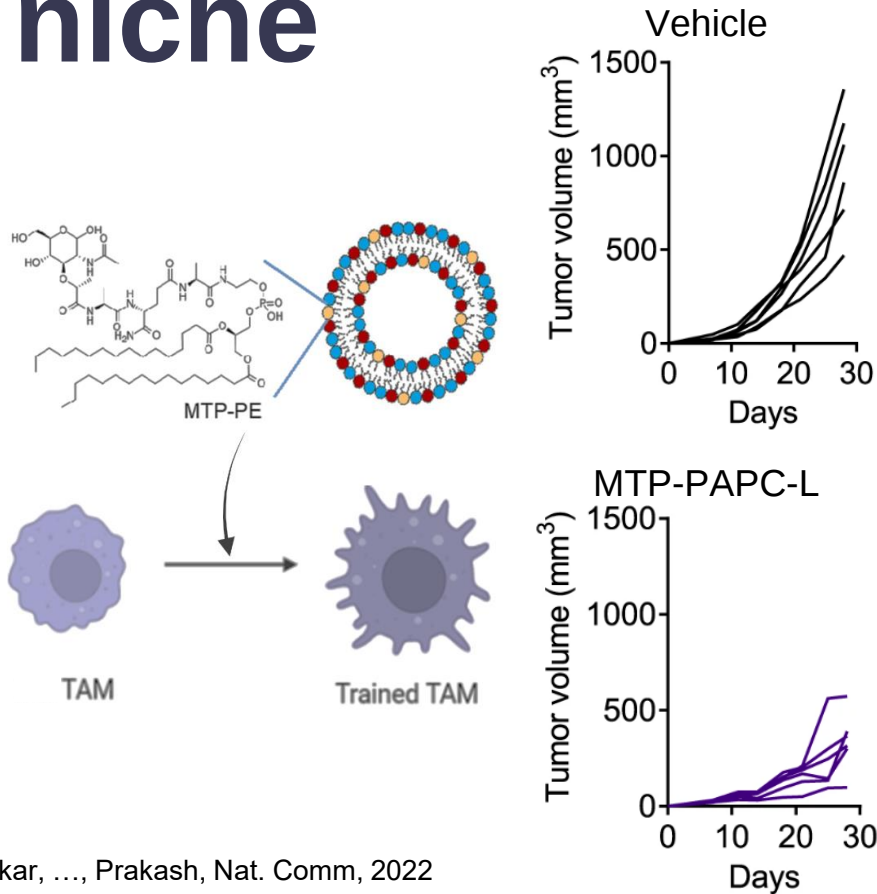
Kuninty, ..., Pednekar, ..., Prakash, Nat. Comm, 2022

Tail-flipping mechanism- molecular dynamic simulation



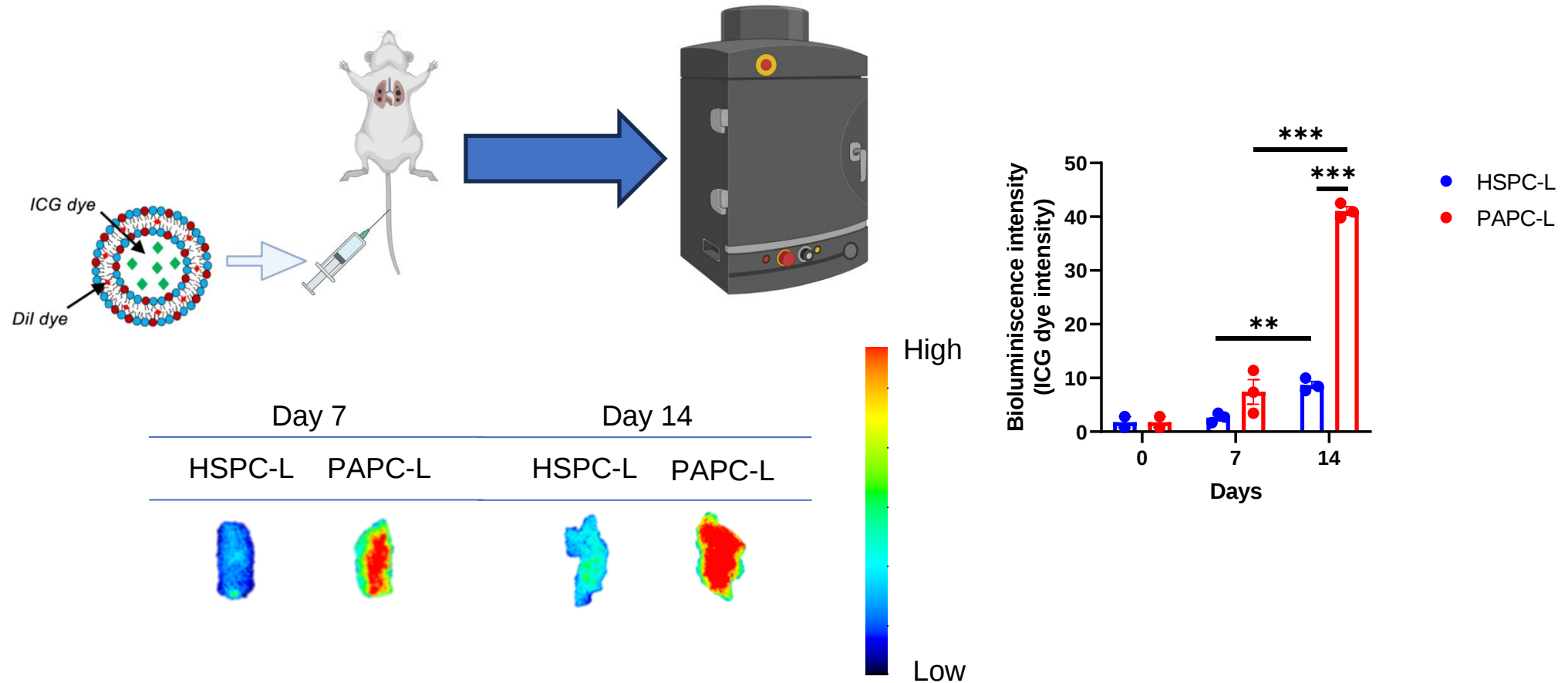
Kuninty, ..., Pednekar, ..., Prakash, Nat. Comm, 2022

Inhibition of lung pre-metastatic niche

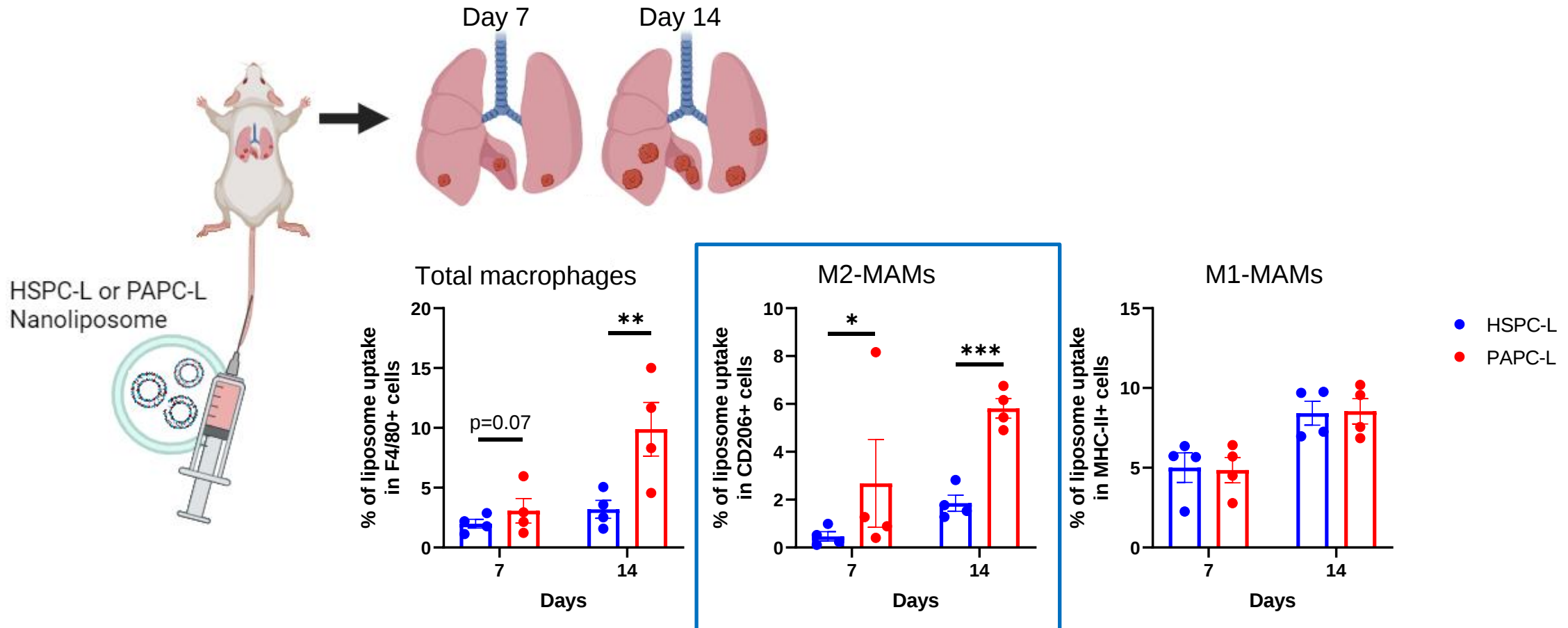


Kuninty, ..., Pednekar, ..., Prakash, Nat. Comm, 2022

PAPC-L accumulates in the lungs



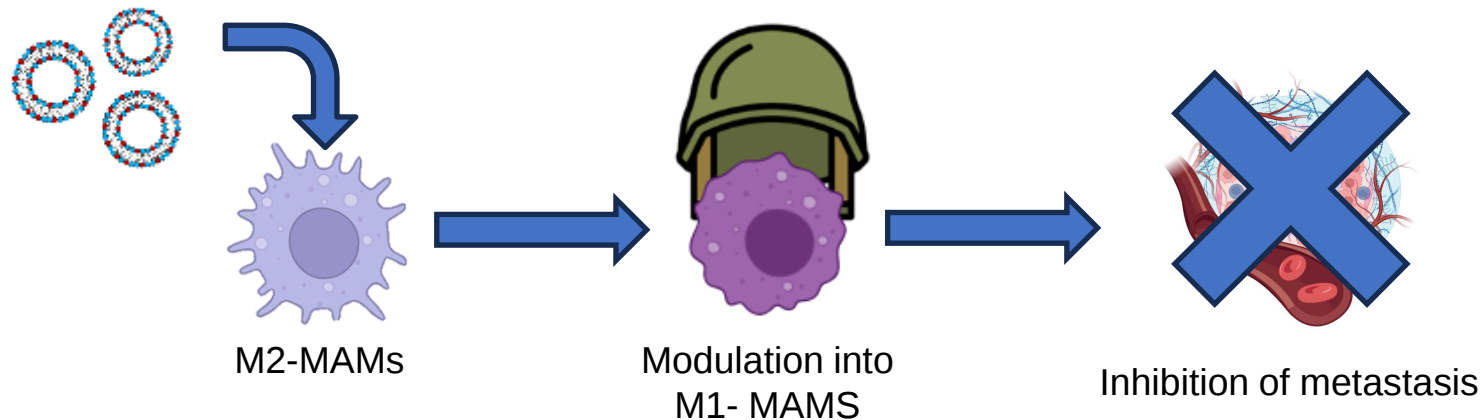
PAPC-L target the M2-MAMs



Conclusion

- Developed a **tail flipping targeting system** to target M2 macrophages via **SR-B1 receptor**
- **Modulate the macrophages** to show anti-tumoral effect
- Inhibit **pre-metastatic niche**
- Proof of **effective targeting to M2-MAMs**

Future outlook



Acknowledgement

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& Phospholipid Research
center



*Thank
you*

