Outcompeting Cancer's "Don't Eat Me" Signal to Promote Immune Clearance

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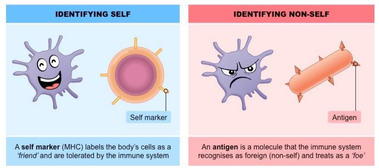
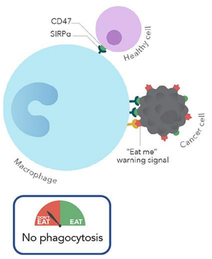
Introduction

The Immune System can effectively differentiate self from non-self to mount an immune response.

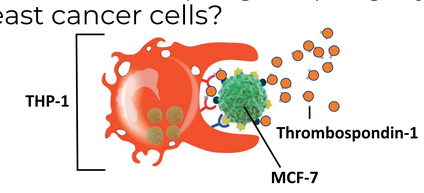


Cancer cells exploit "self" recognition by:

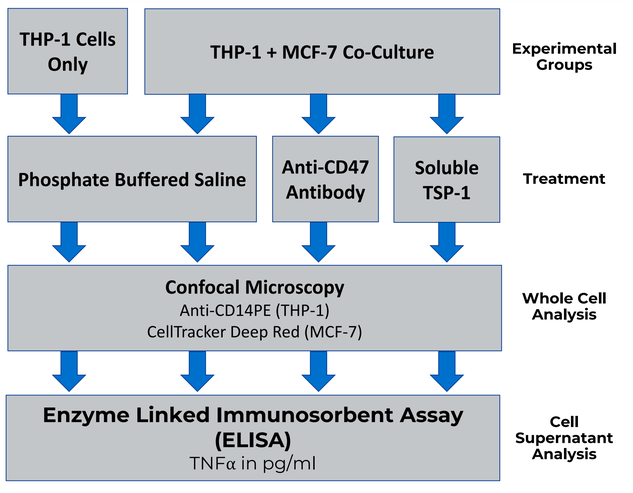
- Being of human origin
- Hijacking cells: produce more self-cell surface marker CD47
- Mimicking healthy self cells through CD47-SIRPα interaction



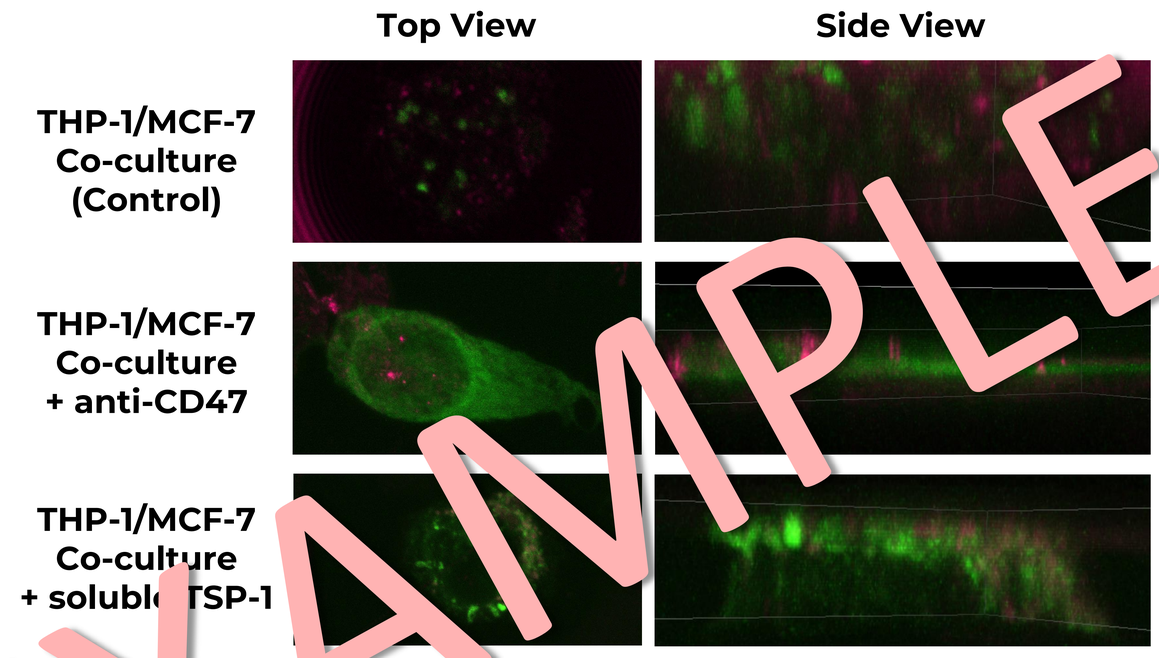
Research Question: Will the known high affinity CD47 ligand, Thrombospondin-1, outcompete the CD47-SIRPα interaction and allow THP-1 macrophage to phagocytose MCF-7 breast cancer cells?



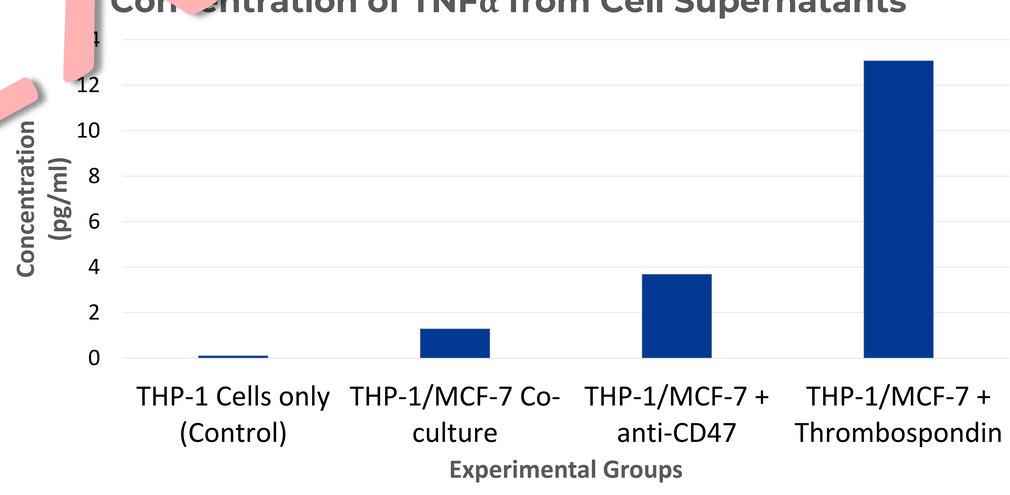
Methods



Results



THP-1: Anti-CD14PE (Green); MCF-7: CellTracker Deep Red (Red)



TNFα	Concentration (pg/m	Absorbance (OD
THP-1 Cells only (Control)	0.10465	0.0951
THP-1/MCF-7 Co-culture	1.289645	0.1152
THP-1/MCF-7 + anti-CD47	3.687839	0.1440
THP-1/MCF-7 + Thrombospondin	13.07613	0.2835

Conclusion

THP-1/MCF-7 co-culture	THP-1/MCF-7 co-culture + anti-CD47	THP-1/MCF-7 co-culture + Thrombospondin-1
• MCF-7 cells not clearly inside-outside THP-1 macrophage • Slight increase in TNFα production	• MCF-7 cells appear to be internalized by THP-1 macrophage • Moderate increase in TNFα production	• MCF-7 cells not clearly inside-outside THP-1 macrophage • Large increase in TNFα production

Improvements:

- Optimize co-incubation time
- Utilize whole cell label for THP-1

Future Studies:

- Try other known CD47 ligands
- Use activated THP-1 cells (M1 vs M2)

Research Team

The interdisciplinary and interprofessional team included a diverse set of experts (students, lab techs, clinicians, and research scientists) from multiple departments in the College of Science and Medicine, with skills in biochemistry, medicine, biology, and morphology.

References

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