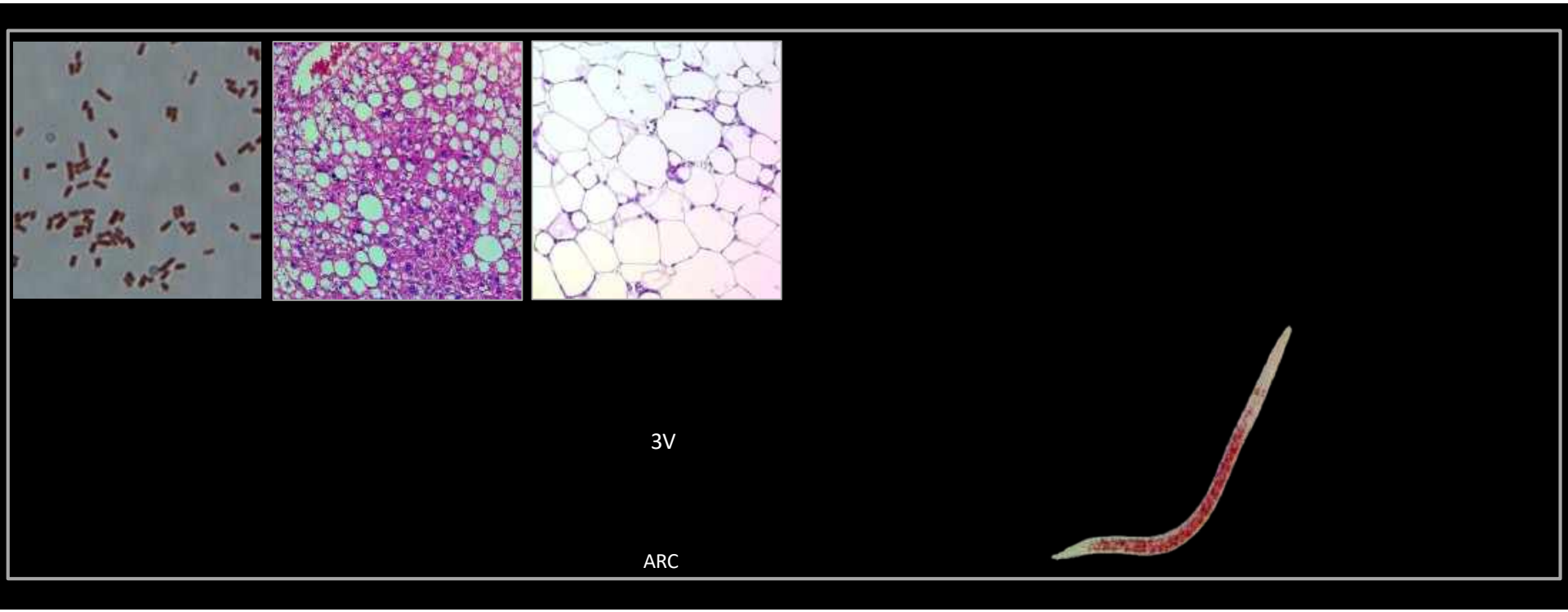
Postbiotics: A new chapter in gut and human health



Hariom Yadav, PhD

Department of Internal Medicine- Molecular Medicine

Wake Forest School of Medicine

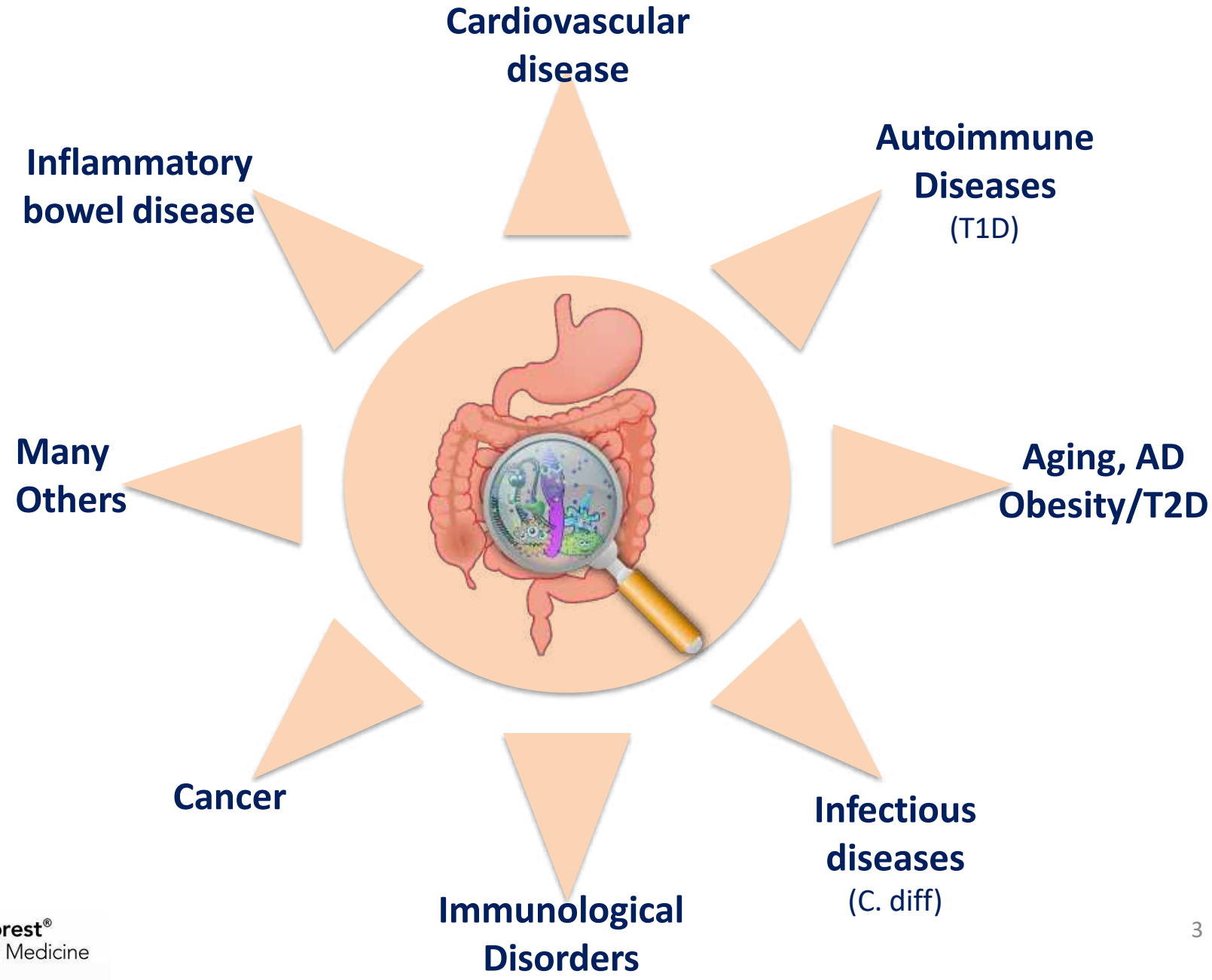
Soon moving to

USF Center for Microbiome Research, University of South Florida

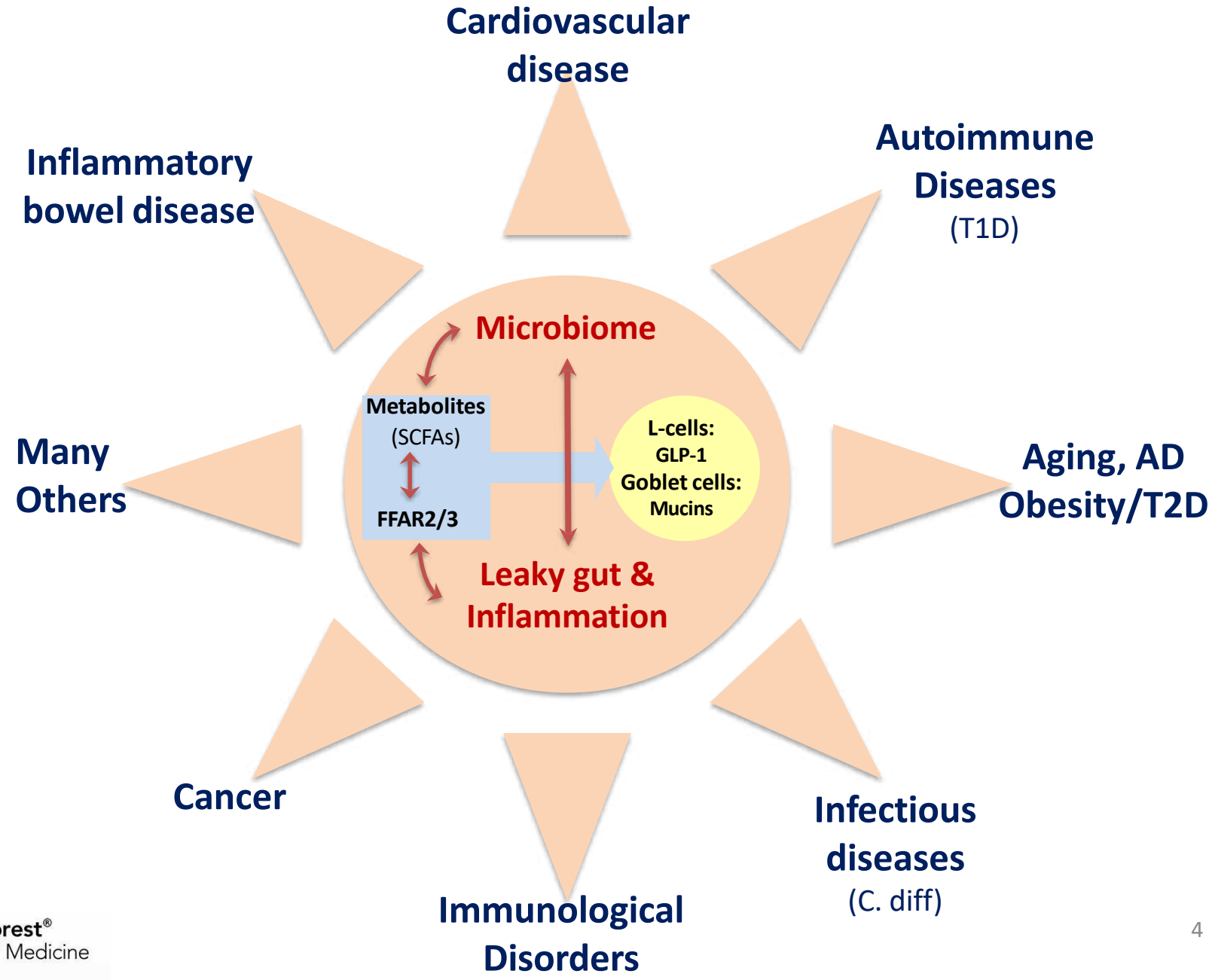
Disclaimers

Postbiotics Inc.- Dr. Yadav is Co-founder and Chief Scientific Officer in Postbiotics Inc., Winston-Salem, NC, USA

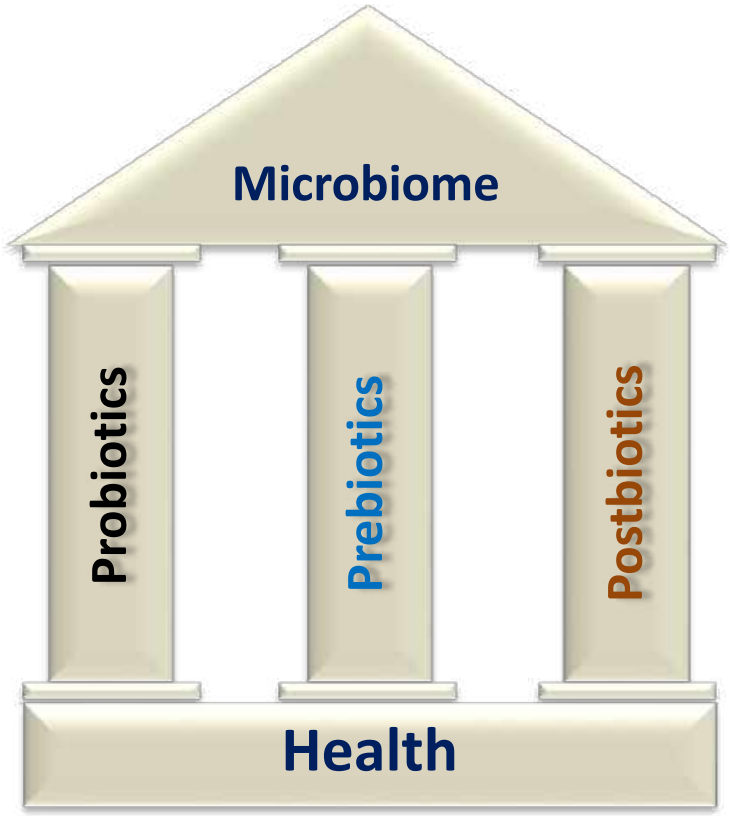
Role of gut microbiome in human diseases



Role of gut microbiome in human diseases

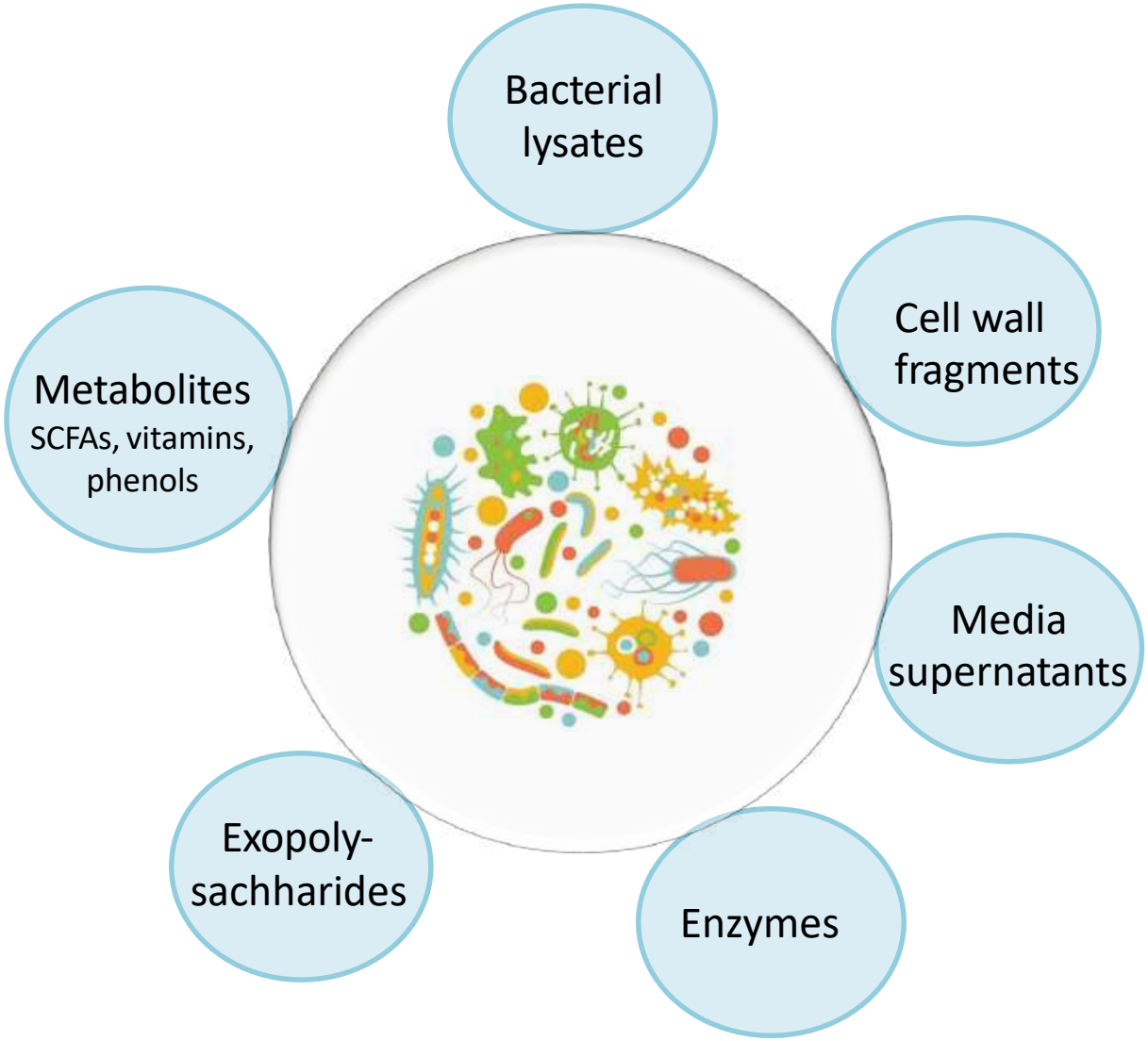


Three pillars to improve human health by microbiome modulations



Postbiotics is functions unit of probiotics and prebiotics

Ways to get postbiotics



History of Probiotics

1908: Prolongation of Life (Probiotics)

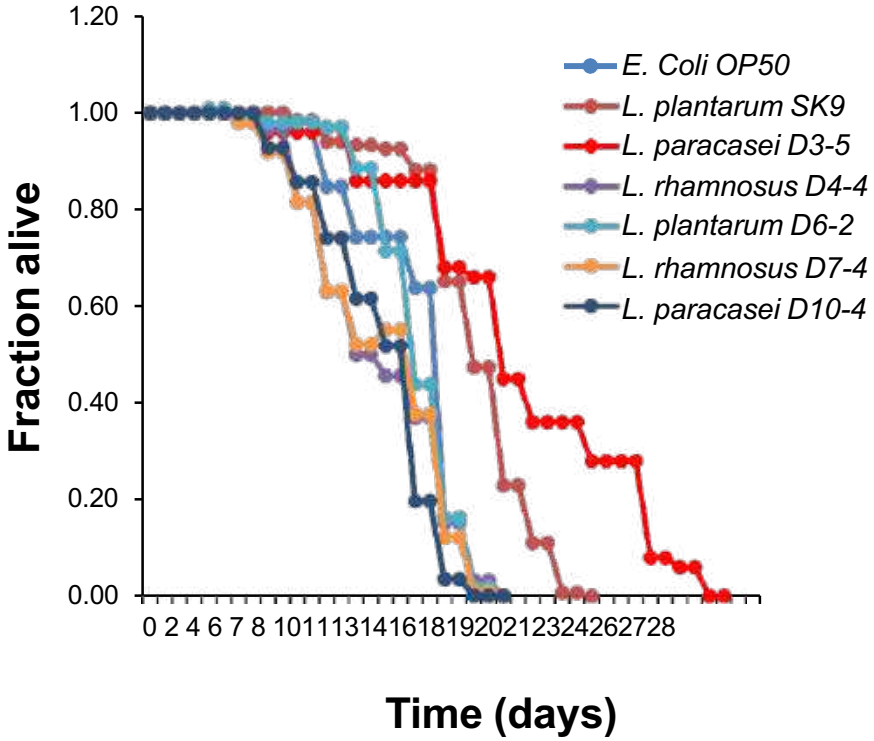
Conceptualize 'probiotics': Acid producing bacteria in milk

1. Whether all probiotics are beneficial for aging and its related diseases?

2. Do they have to be alive to be functional?

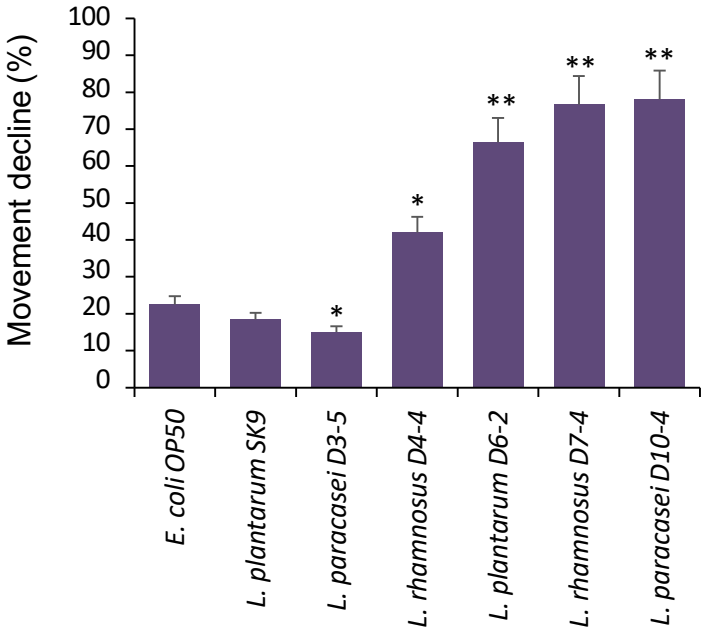
Modern Immunology

Anti-aging effects of are strain dependent



10 days increase equivalent to 50 years of human life

Physical function decline with aging



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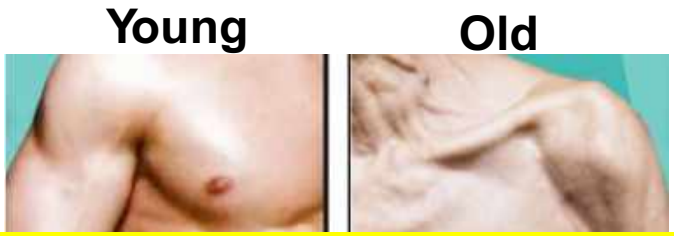
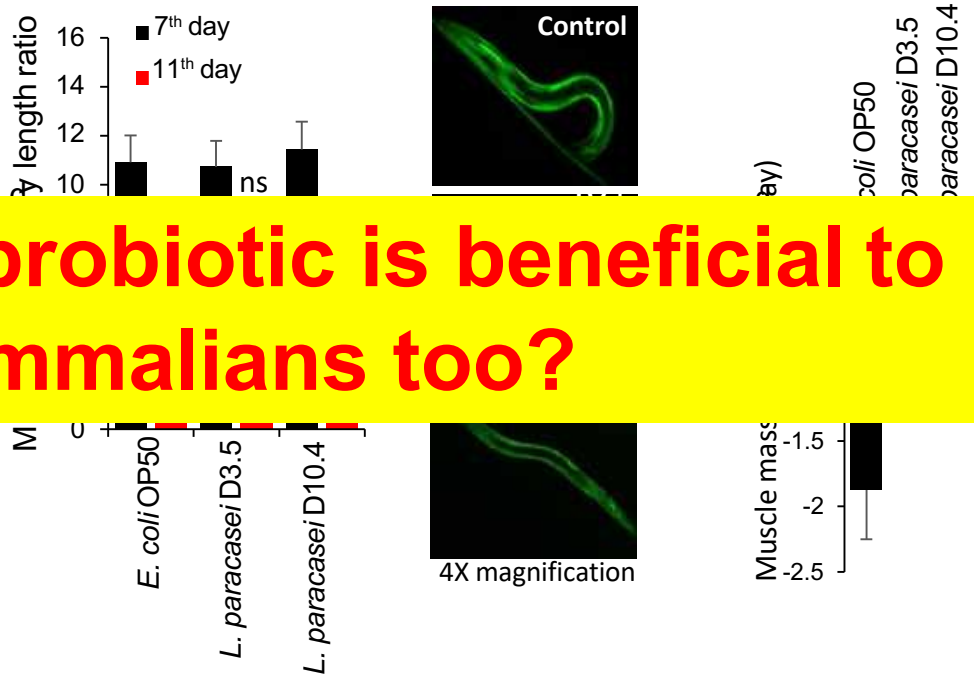
Anti-aging effects of probiotics were by preserving muscle mass (decreasing age-related Sarcopenia)



(major cause of reduced physical function)

Is this dead probiotic is beneficial to mammalians too?



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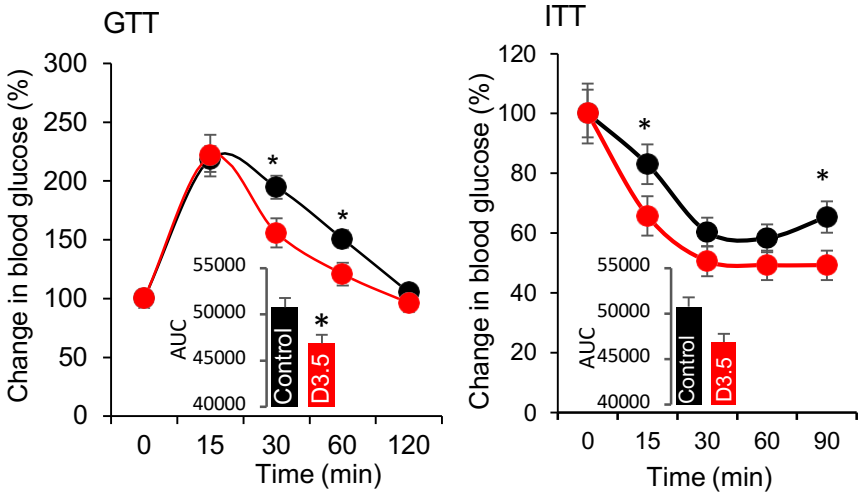
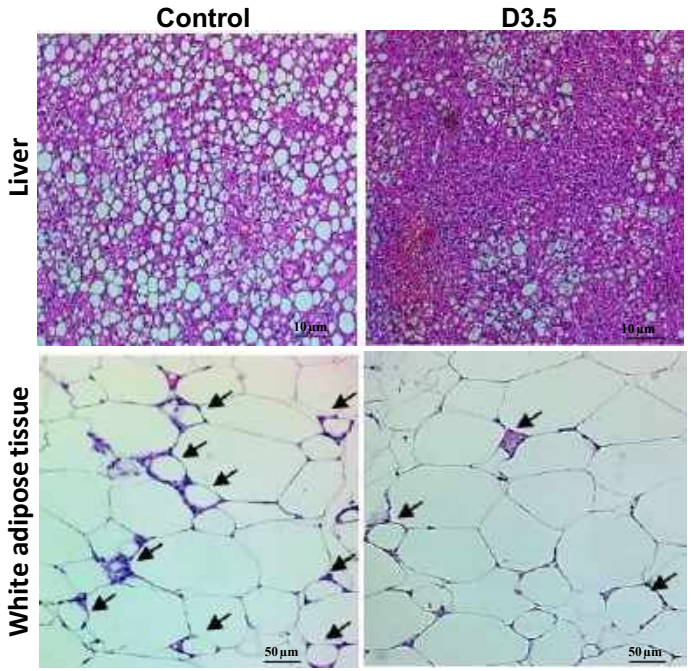
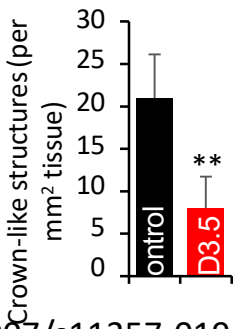
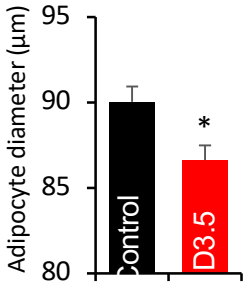
Dead D3.5 protects HFD-induced metabolic dysfunction in older mice

Aging is gaining extra pounds, increasing fat mass over lean mass ratio









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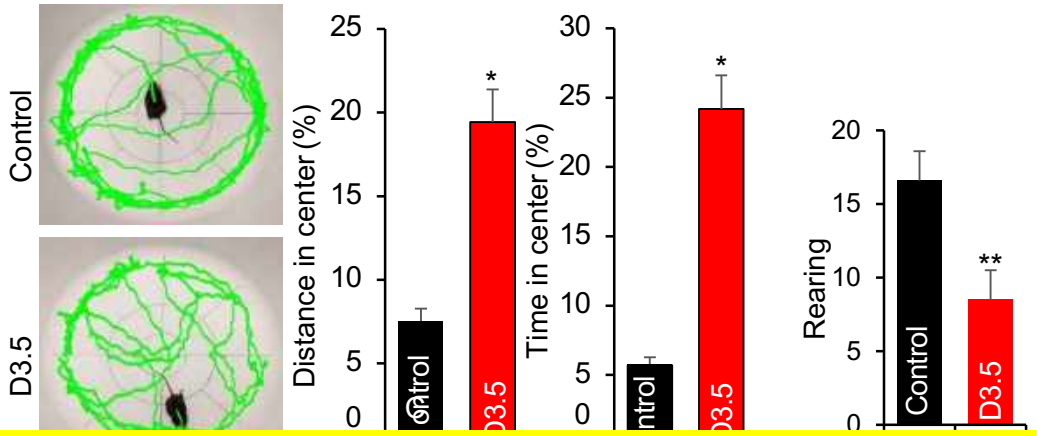
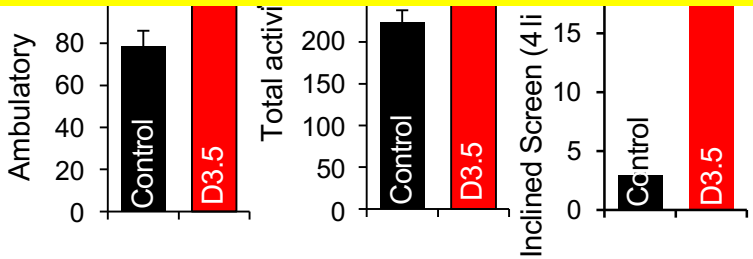
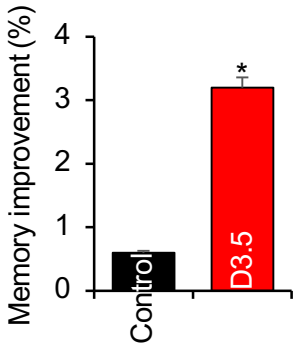
D3.5 reduces aging-related comorbidities in older mice



How all these benefits can come from one type of treatment?





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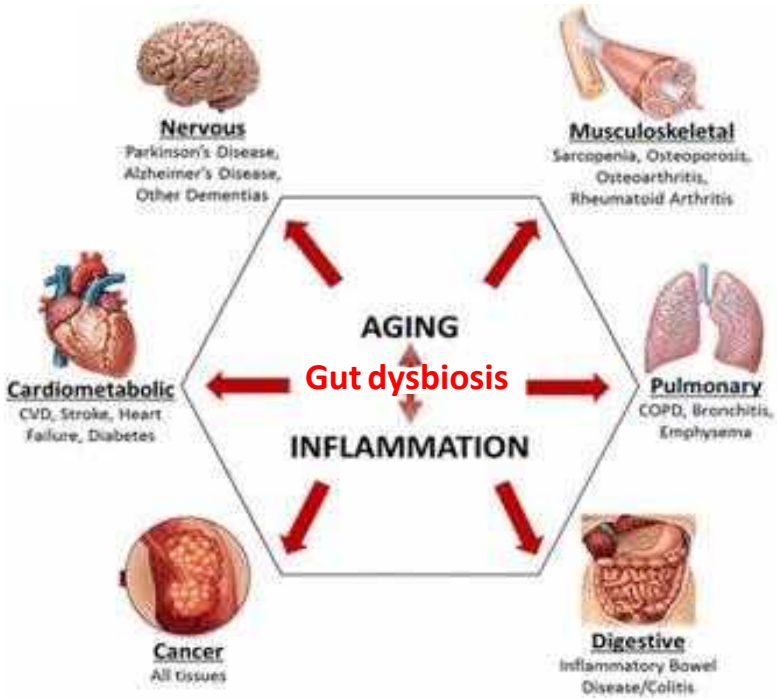
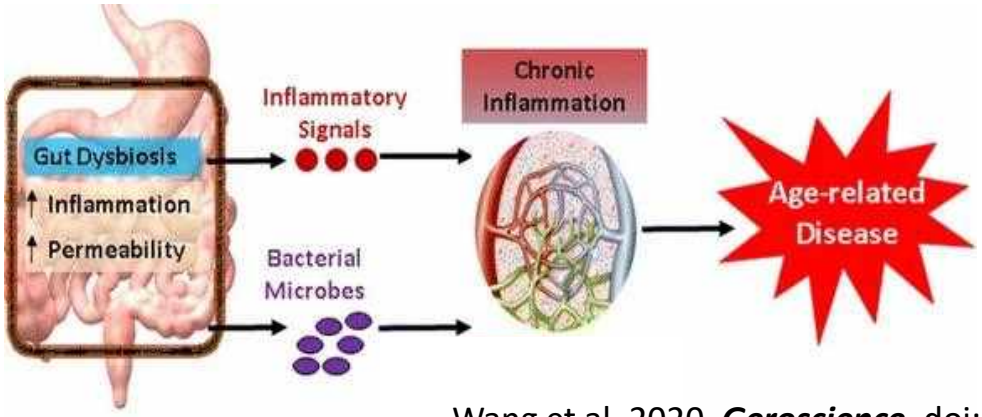
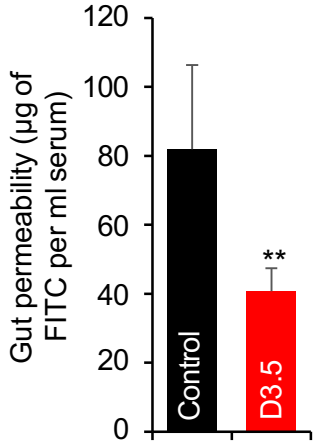
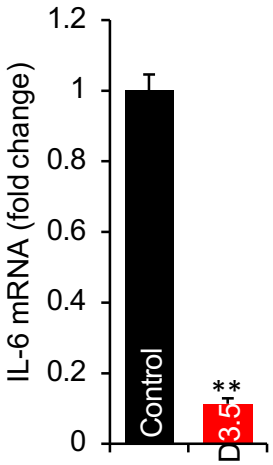
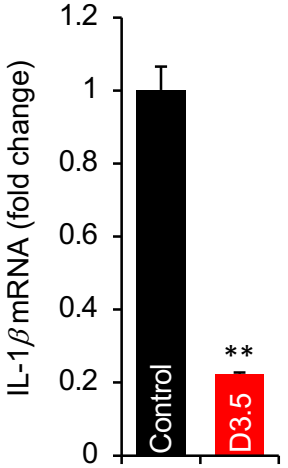
D3.5 reduces age-related leaky gut and inflammation in older mice











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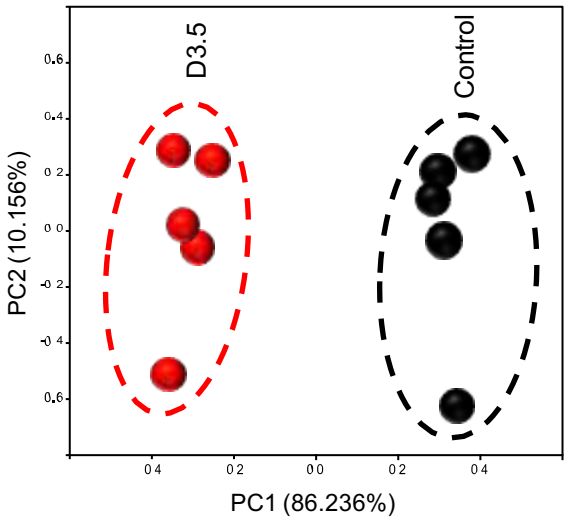
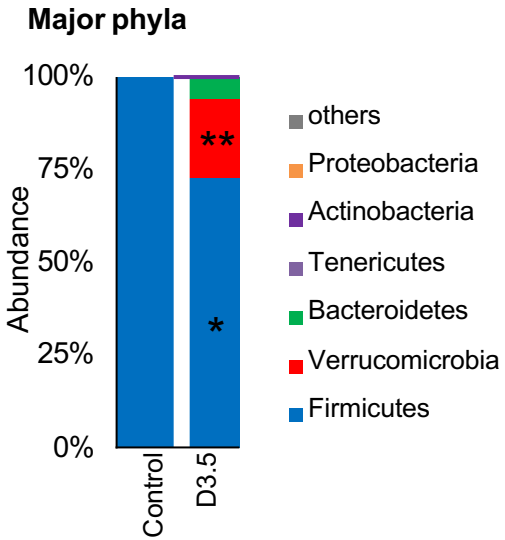
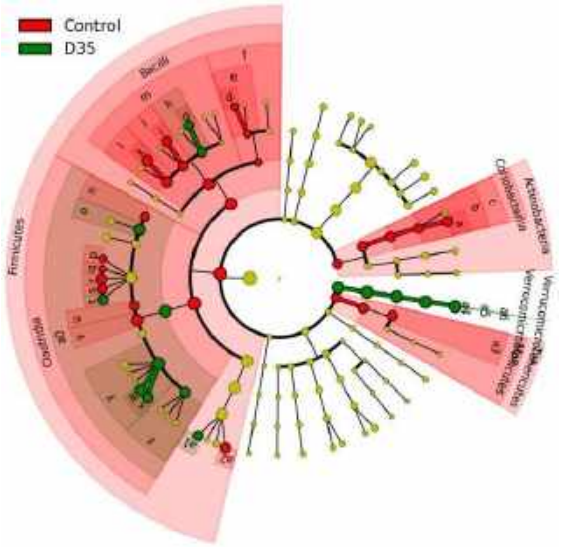
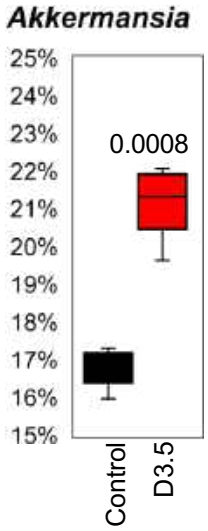
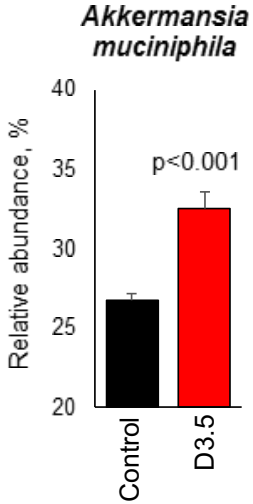
Dead D3.5 beneficially modulates gut microbiome in older mice











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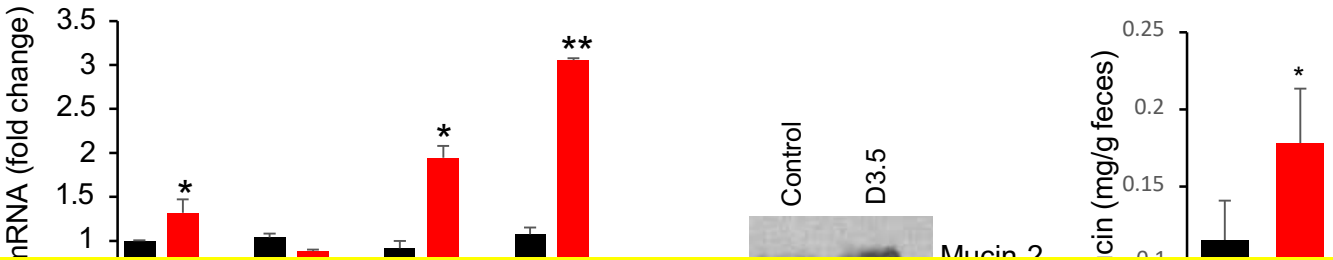
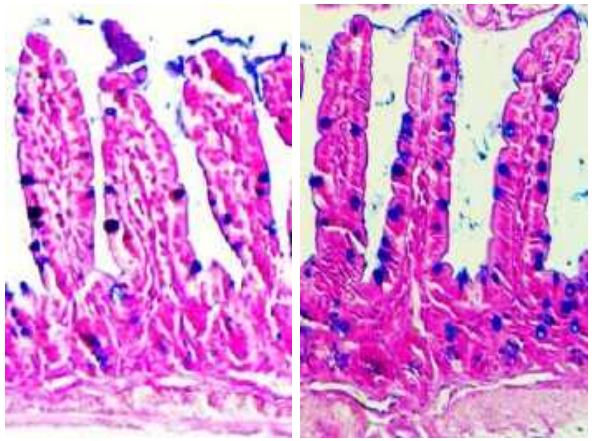
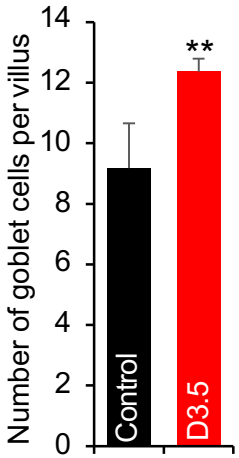
Dead D3.5 stimulates mucin production in the older gut



How a dead bacterial cell feeding can stimulate mucin production?





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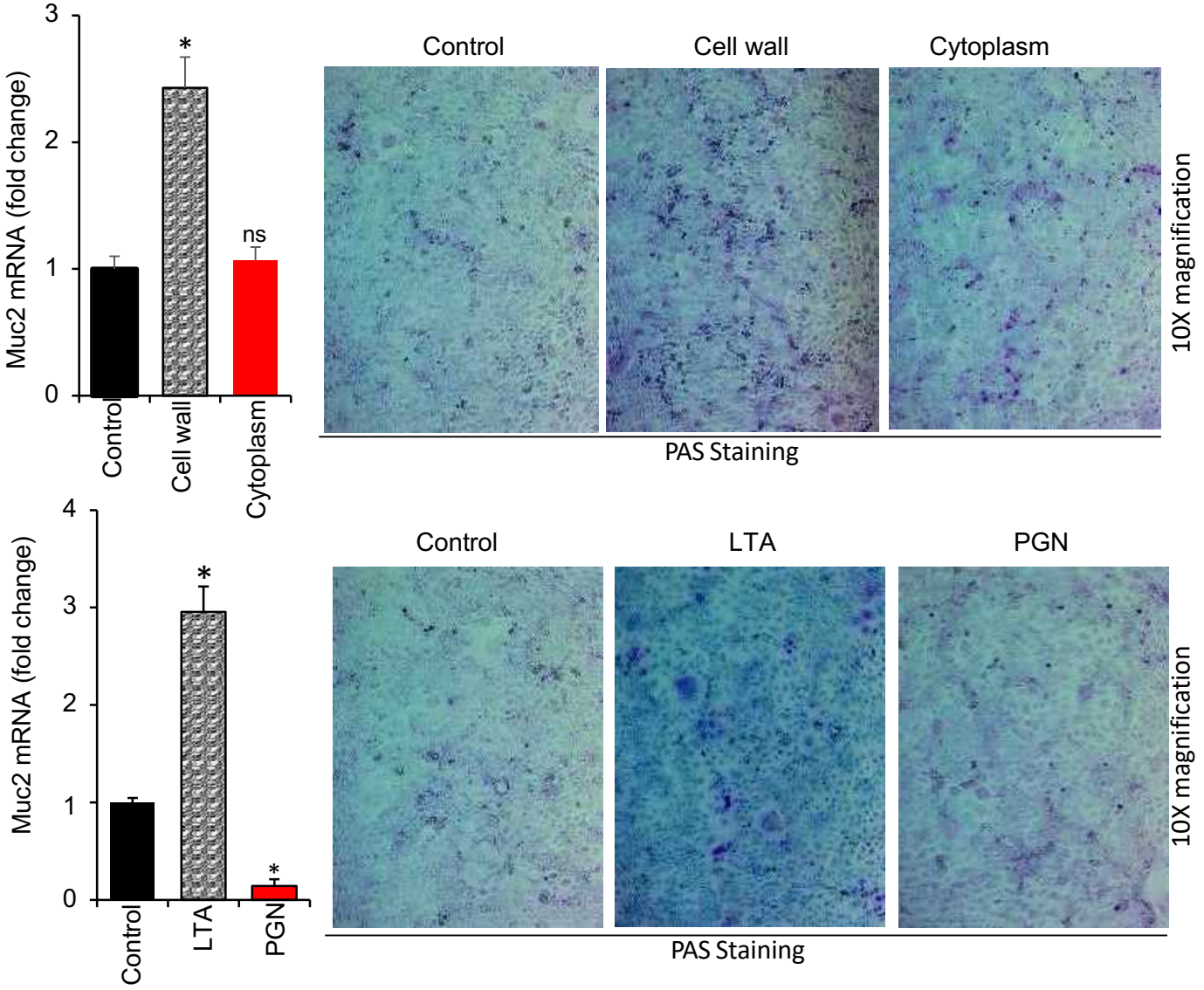
Lipoteichoic acid (LTA) derived from D3.5 stimulates mucin production



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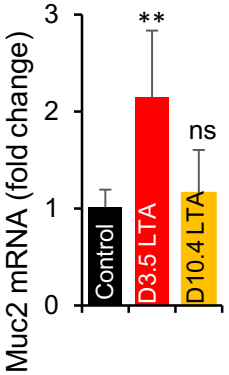
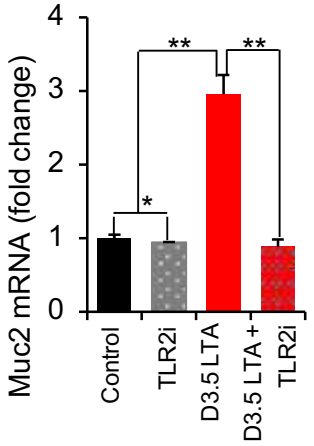
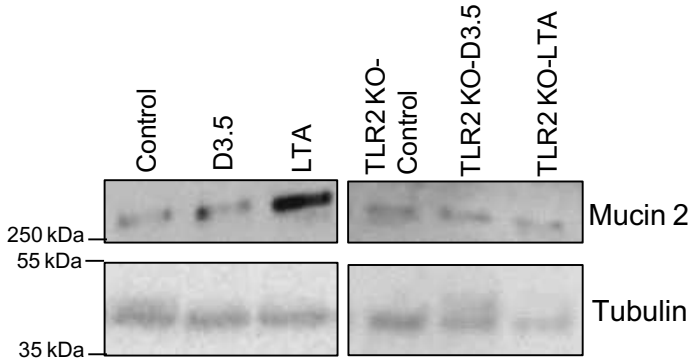
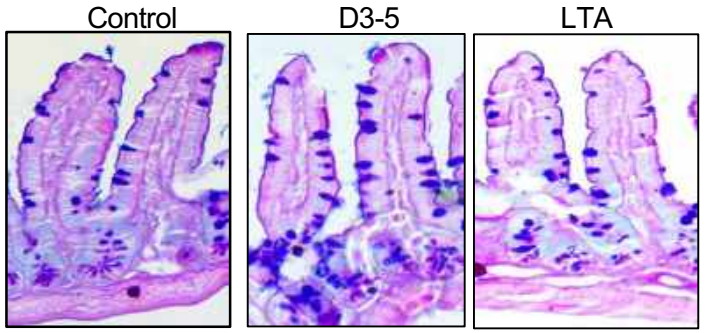
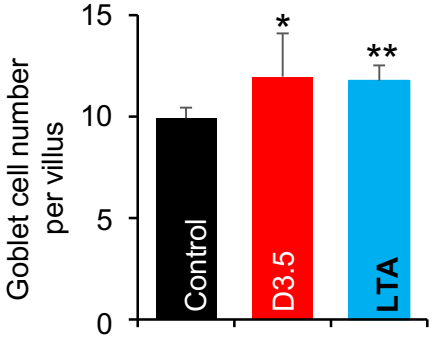
D3.5 cell wall derived LTA D3.5 activates TLR2 signaling which in turn increased mucin production











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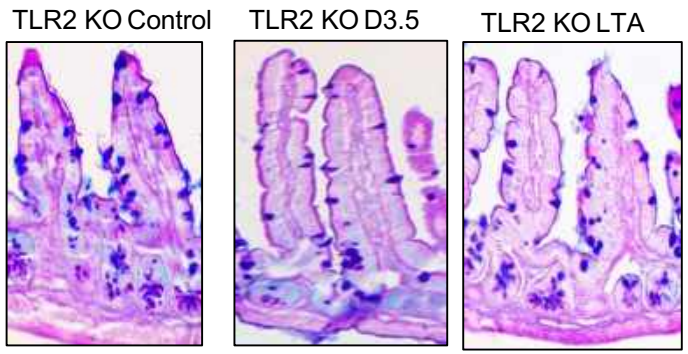

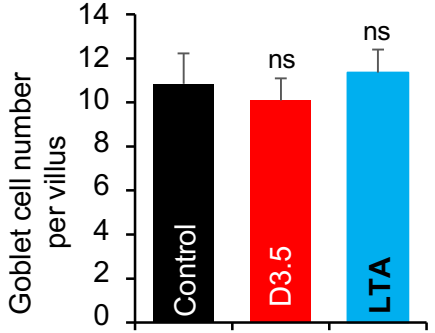

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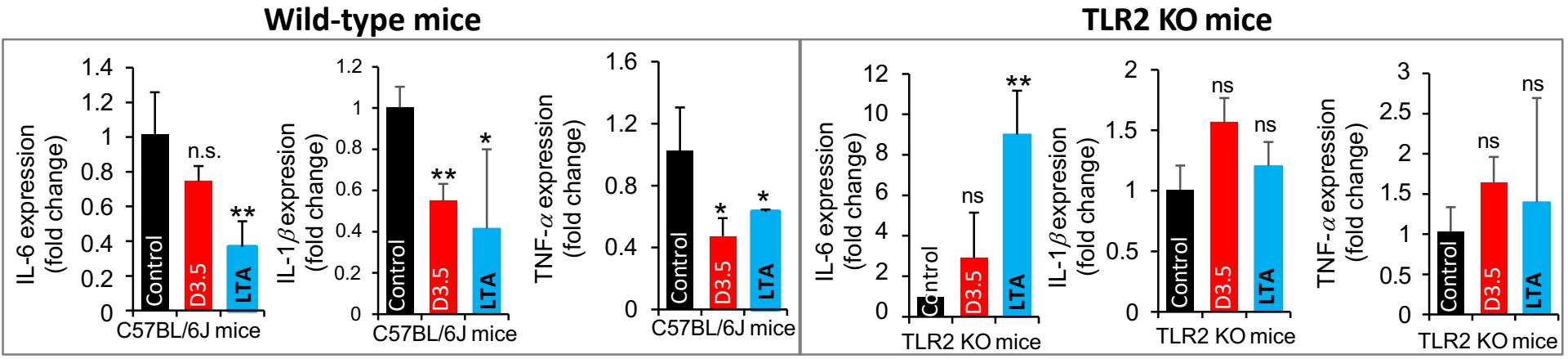
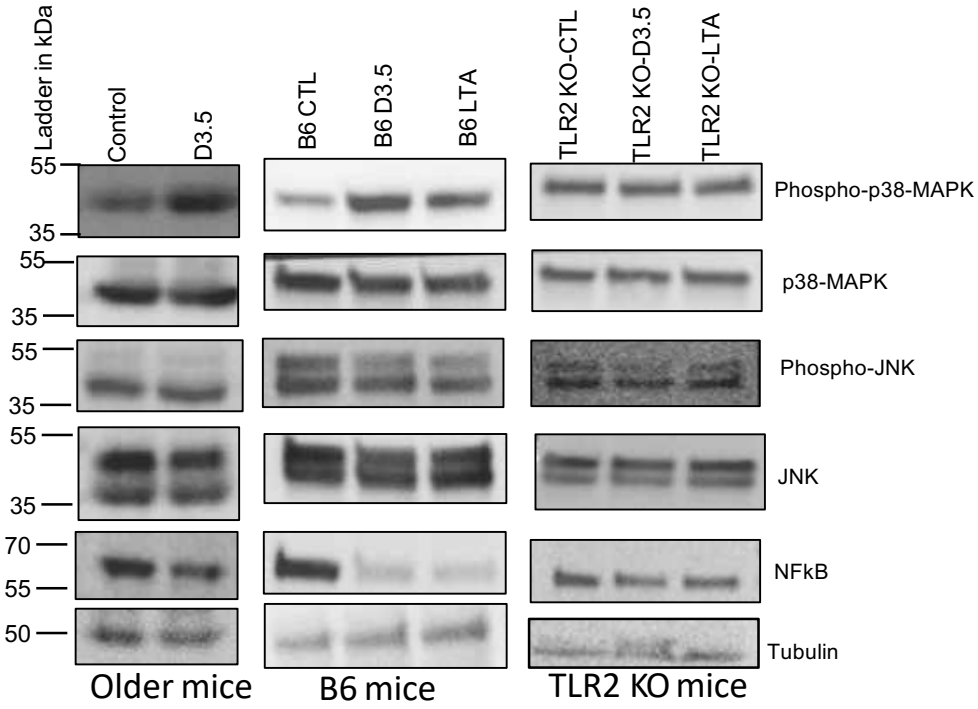
D3.5 cell wall derived LTA D3-5 activates TLR2 signaling which in turn increased mucin production





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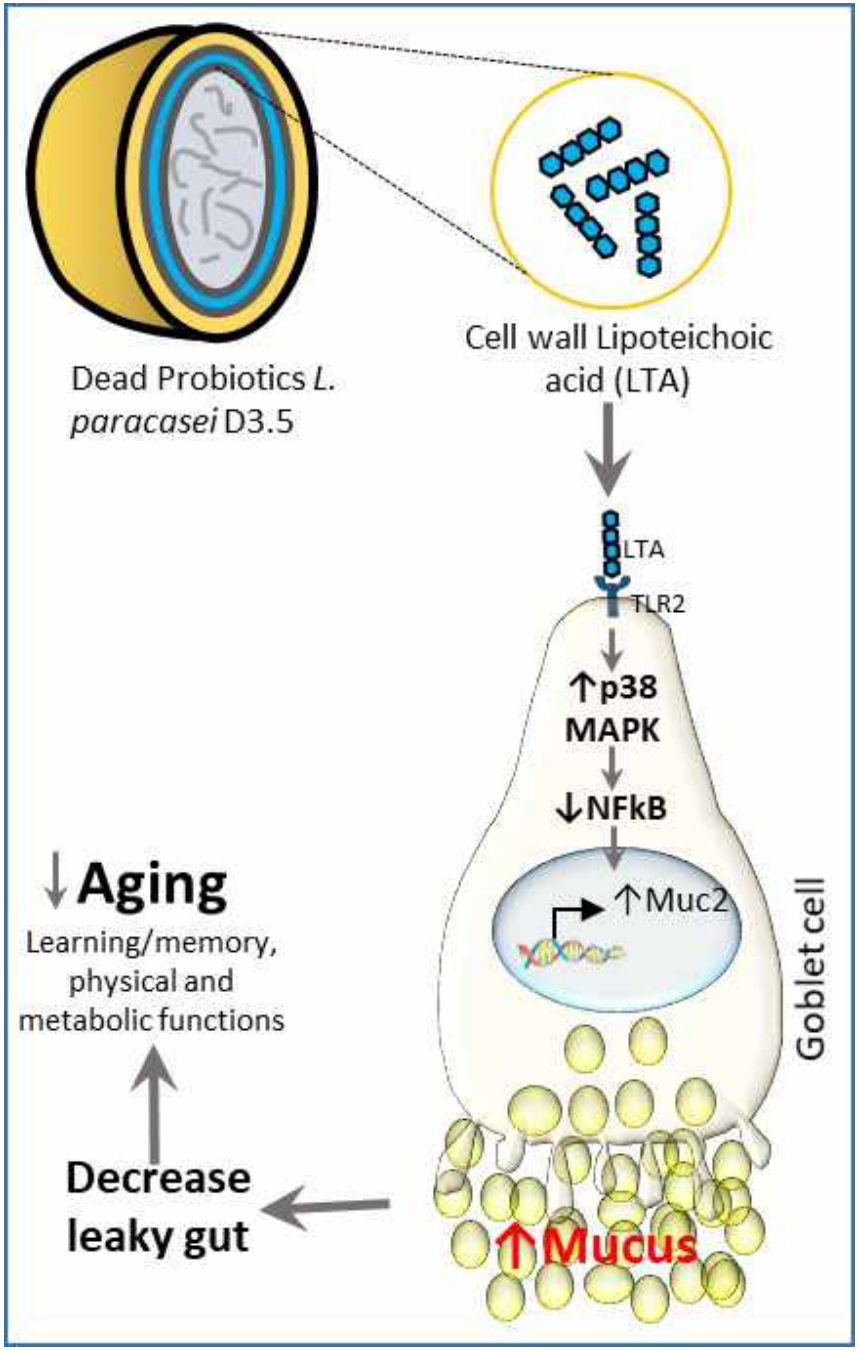
Summary



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Acknowledgements

Yadav Lab

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- Halle Kincaid
- Ria Singh

Collaborators

Donald McClain, MD, PhD
Suzanne Craft, PhD
Stephen Kritchevsky, PhD
Dalane Kitzman, MD
Shannon Macauley, PhD
Tao Ma, PhD
Bo Wang, PhD
Miranda Orr, PhD
Jamie Justice, PhD
Jingzhong Ding, PhD
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