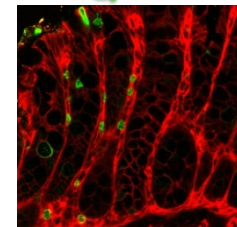
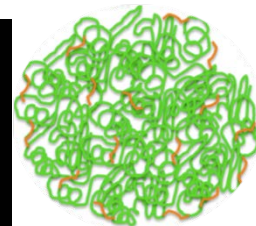




# Novel Bacteria Protein Nanoparticles for the Treatment of Inflammatory Bowel Disease

From the laboratories of:  
Andrew S. Neish, M.D. (Pathology)  
Julie A. Champion (Georgia Tech)

Cale Lennon  
Director, Licensing  
OTT Breakfast Club  
May 13, 2014



# Inflammatory Bowel Disease

- Crohn's Disease and Ulcerative Colitis
- 1.2 M affected individuals in U.S. (2012)
- Severe impact on quality of life
  - Abdominal pain and cramping
  - Fatigue
  - Chronic diarrhea
  - Development of fistulas and abscesses
  - Elevated risk of intestinal cancer

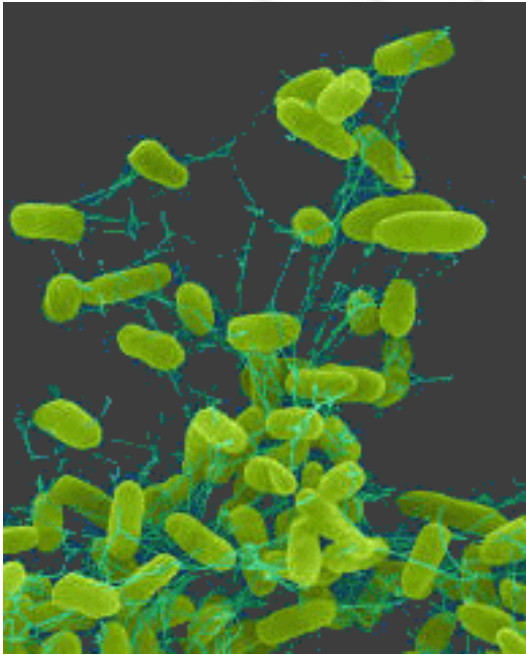


# Overkill with Current IBD Therapy

- Existing Therapies
  - Corticosteroids
  - TNF- $\alpha$  inhibitors (Remicade)
  - Azathioprine/6-Mercaptopurine
  - 5-aminosalicylic acid
- Problems
  - Apoptosis of immune system cells
  - Systemic immunosuppression (infection and cancer)
- Unmet need
  - Locally acting therapy that selectively inhibits inflammation



# Anti-Inflammatory By Nature

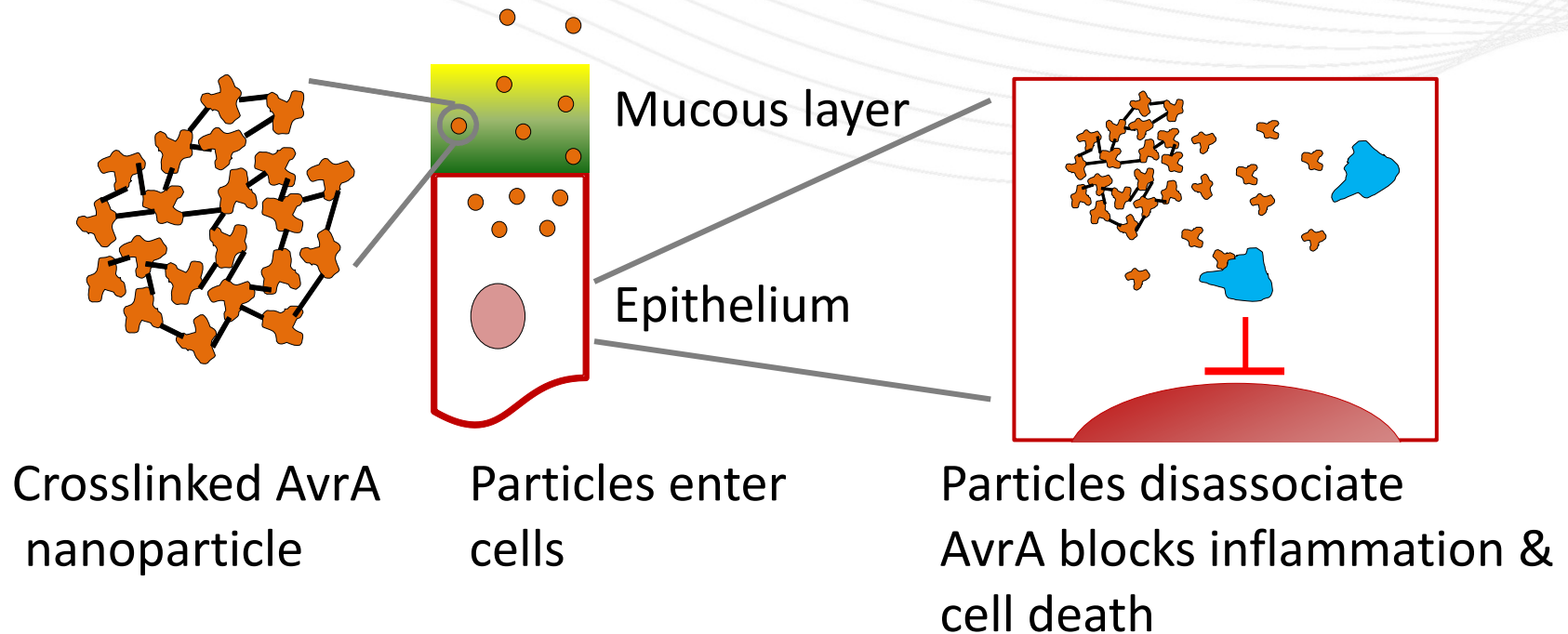


*Salmonella enterica*

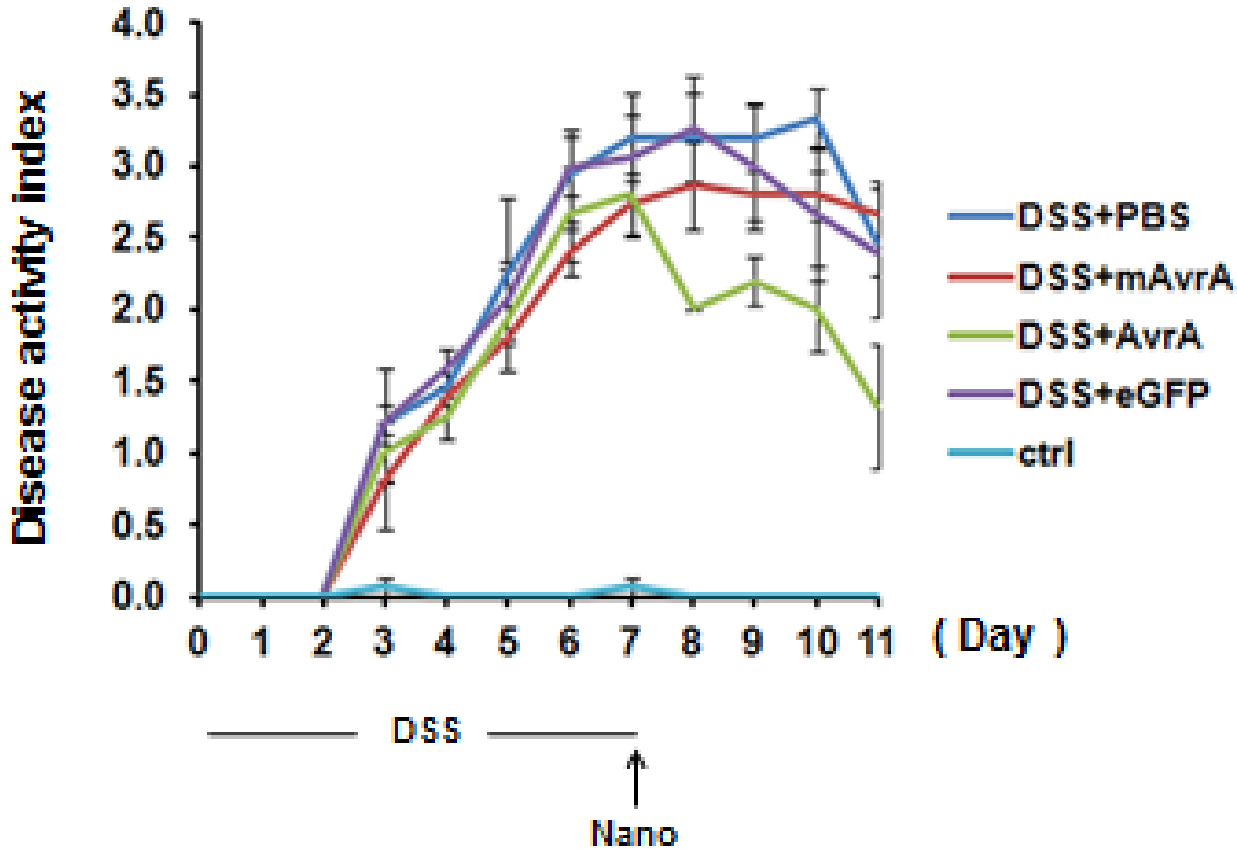
- Pathogen-host effector protein: AvrA
- Non-toxic
- Reduces host inflammatory response
- No cellular apoptosis



# Protein Nanoparticle Delivery System



# Efficacy POC of AvrA Nanoparticles in Model Colitis



DSS: dextran sulphate sodium

# IP and Future Steps

- PCT patent application filed March, 2014
- Further characterize cellular uptake and molecular target engagement *in vivo*
- Repeat in additional IBD models
- Demonstrate oral bioavailability and delivery to different regions of the gut