

# Biologics and Nanosponges

# What is a biologic drug (biologics)?

- a product that is produced from living organisms or contain components of living organisms.
- Include a wide variety of products derived from human, animal, or microorganisms by using biotechnology.
- Types include vaccines, blood, blood components, cells, allergens, genes, tissues, and recombinant proteins.

- Biologic products may contain proteins that control the action of other proteins and cellular processes, genes that control production of vital proteins, modified human hormones, or cells that produce substances that suppress or activate components of the immune system.

# Biologics Cost to consumers

- The “gold” standard of care for diseases like cancer, autoimmune disorders and diabetes, but they are often VERY expensive. Of the 20 most expensive drugs in the world right now:
- 12 of them are biologics representing \$100 billion of the \$153 Billion spend on these medicines.\* (Mylan)
- Only 2% of the US population uses biologics yet account for 26% of prescription drug spending

# These expensive medicines are awaiting better delivery systems

- To reduce adverse reactions
- Target specific areas
- Speed up efficacy

## Enter-----Bio-adhesive Nanoparticles

- $1/100^{\text{th}}$  or less the size of a human hair
- Created from polymers and components of red or white blood cell

Bolus injectors like this may be one of the solutions. Pharma analysts expect explosive growth in this area with more than 42 million devices to be sold by 2027 (Global Industry Insight and Roots Research Report 2017)



# Nanosponges

[https://www.kpbs.org/news/2018/sep/03/  
ucsd-engineer-invents-microscopic-  
sponge-combat-ar/?  
utm\\_content=buffer5ef16&utm\\_medium=s  
ocial&utm\\_source=facebook.com&utm\\_ca  
mpaign=buffer](https://www.kpbs.org/news/2018/sep/03/ucsd-engineer-invents-microscopic-sponge-combat-ar/?utm_content=buffer5ef16&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer)

- This tiny round biodegradable polymer coated with the membranes of neutrophils, a type of white blood cell. Just these two components that act as a sponge neutralizing all different types of systemic inflammation or even local inflammation. They can absorb all types of inflammatory factors of biomolecules. Then they automatically degrade, leaving nothing toxic behind.