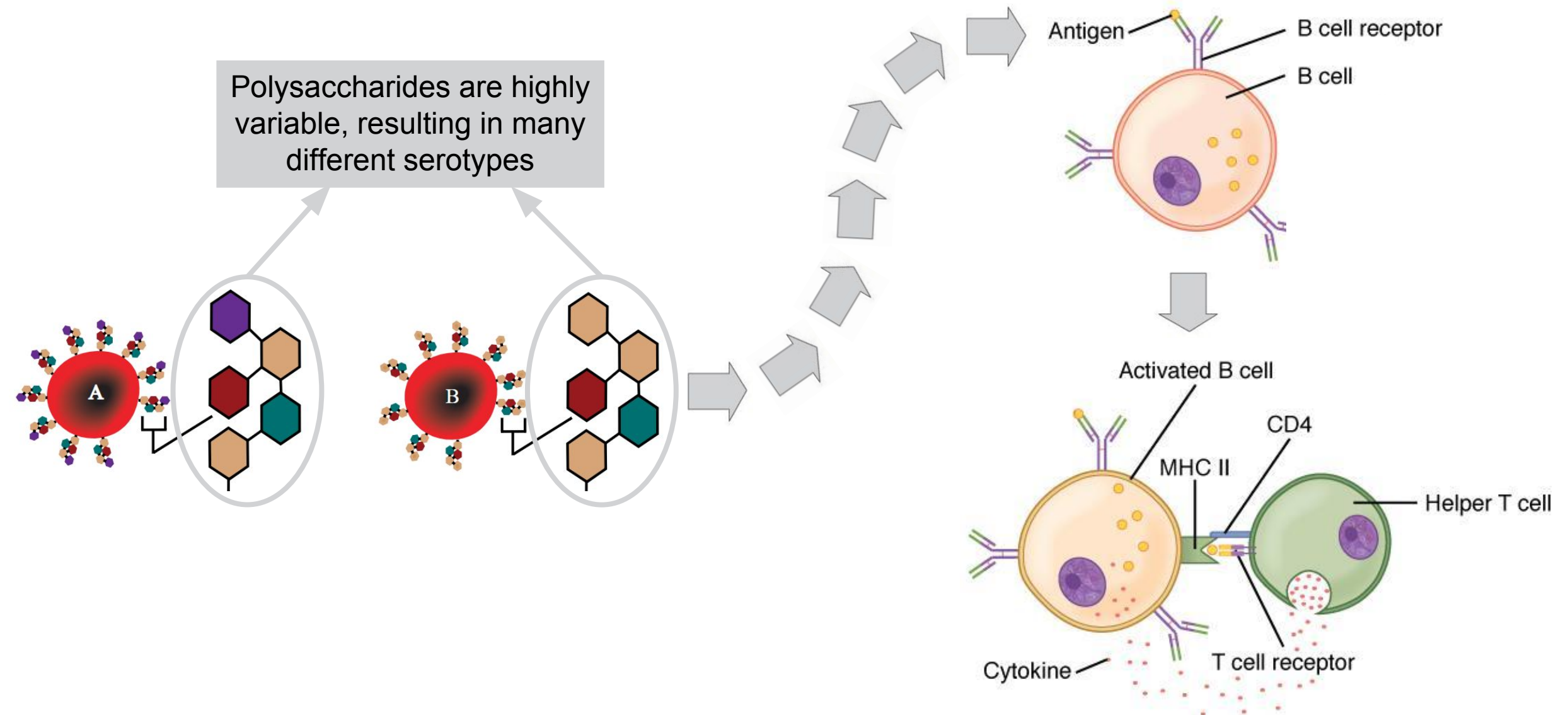


Conjugate Vaccines

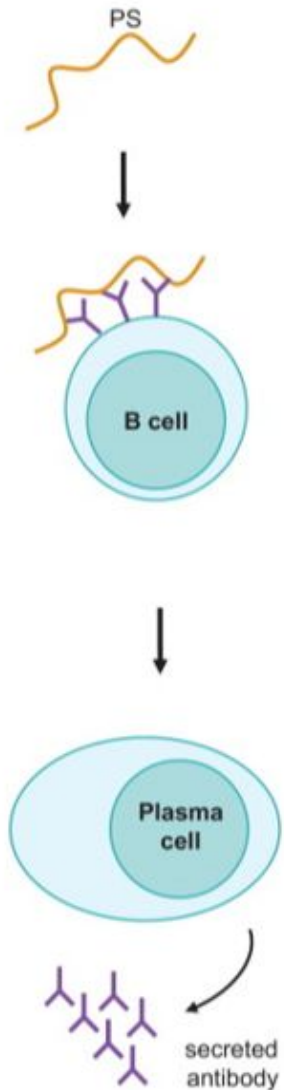
Eleonore Duroyon, Céline van Haaren and Juliette Margaria



Immune response to pathogens



Conjugate vaccine generates a T cell dependent response



Subunit vaccine: polysaccharide (PS)

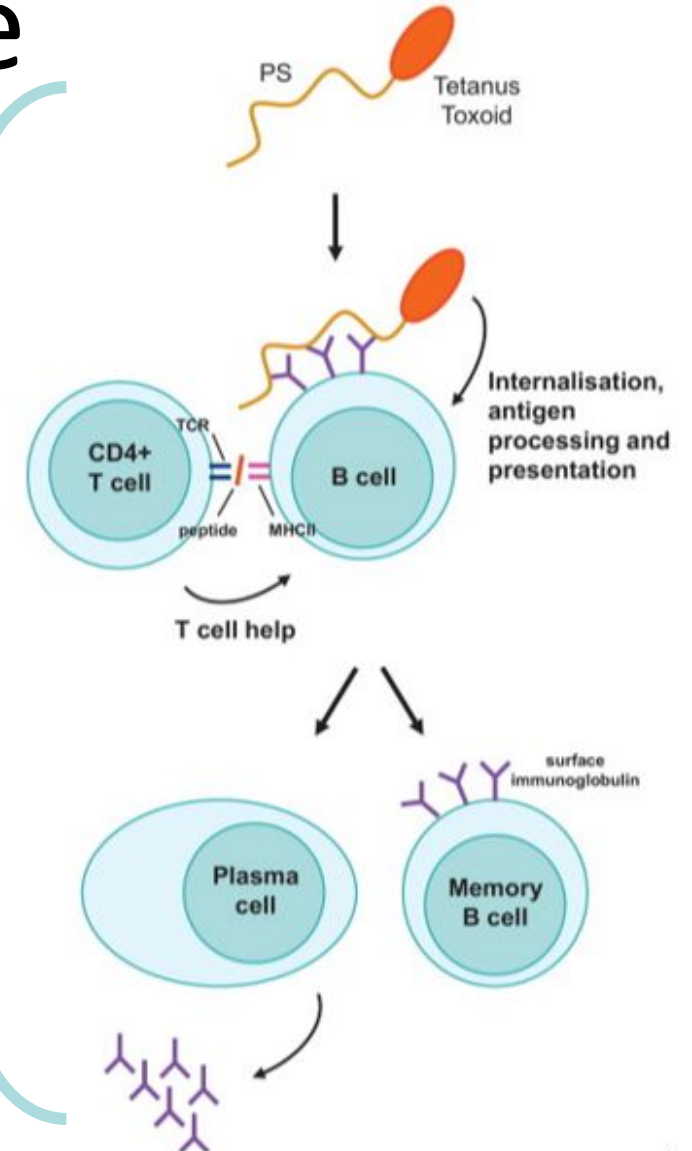
T cell independent response

- **Weak** immune response
- Antibody has **low** affinity for antigen
- No memory cells generated

Conjugate vaccine: PS + antigenic protein

T cell dependent response

- **Strong** immune response
- Antibody has **high** affinity for antigen
- Memory cells generated



Haemophilus influenzae

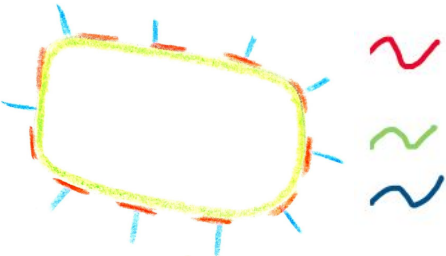
- One of the leading causes of invasive bacterial infection in young children worldwide
- First conjugate vaccines extensively used
- Gram negative bacteria

Disease

- severe pneumonia and meningitis

Composition of the capsule and virulence

- 6 distinct capsular serotypes: a,b,c,d,e,f
 - type b is most virulent
- special cap: cap b (DNA duplication)

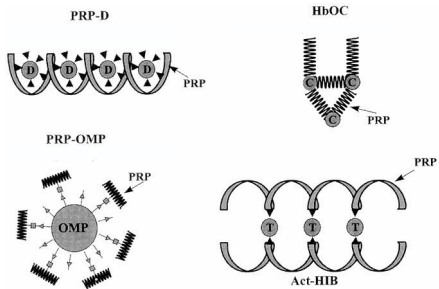


Virulence Factors

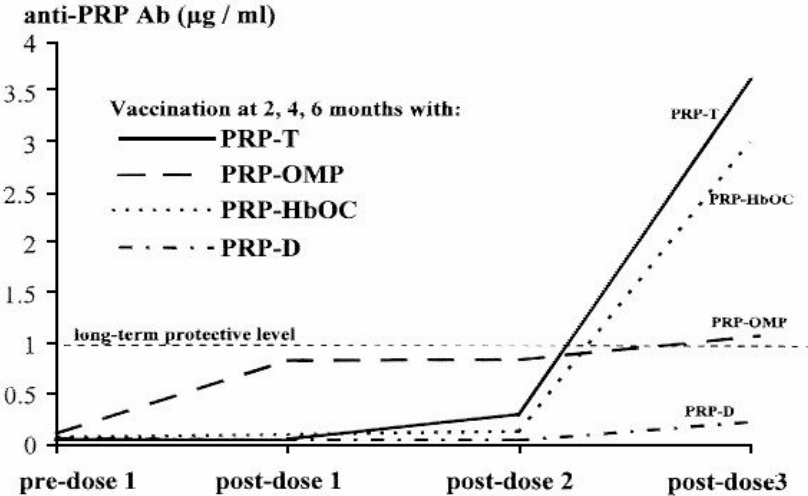
- polyribitol ribose phosphate polysaccharide (PRP)
- lipooligosaccharide (LOS)
- alternating expression of pili

87% decrease of the number of cases of HiB in the US

Composition vaccines



Title: Differing configuration of four HiB conjugate vaccines



Vaccine	Polysaccharide Size	Carrier Protein	Linkage
PRP-D	Medium	Diptheria Toxoid	6-carbon
HbOC	Small	Diptheria Toxoid Mutant	None
PRP-OMP	Medium	N meningitidis outer membrane protein	Thioether
PRP-T	Large	Tetanus toxoid	6-carbon

Campylobacter jejuni

- Most common bacterial cause of enterogastritis in humans
- Encapsulated, Gram negative, zoonotic, invade the intestinal epithelium

Disease

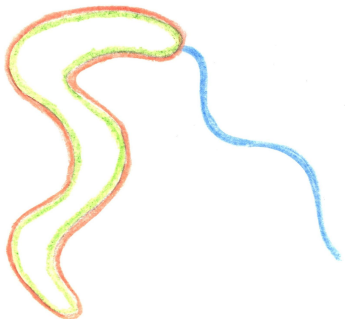
symptoms : acute diarrhea, fever, and abdominal pain

Post infectious serious sequelae

mimicry of the outer lipooligosaccharide (LOS) regions => Guillain-Barré syndrome

Capsule and virulence

47 different serotypes (HS1, HS2, and HS4 most common
50% of the strains, HS 23/36 common in developing countries)



- ~ Capsule → major serodeterminant
- ~ lipooligosaccharide (LOS)
- ~ Flagella → colonization

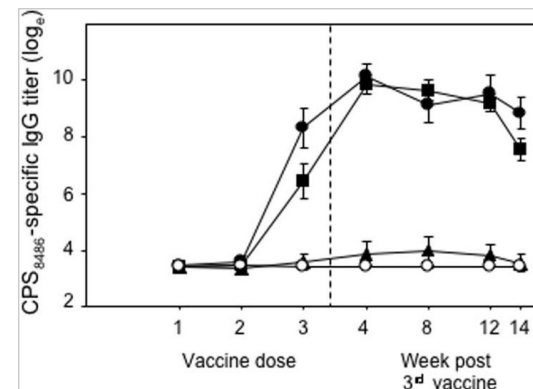
hyperendemic:
40% children
affected in
developing
regions of the
world

Composition vaccines

- no licensed vaccines → 2 prototypes
- against strains without mimicry

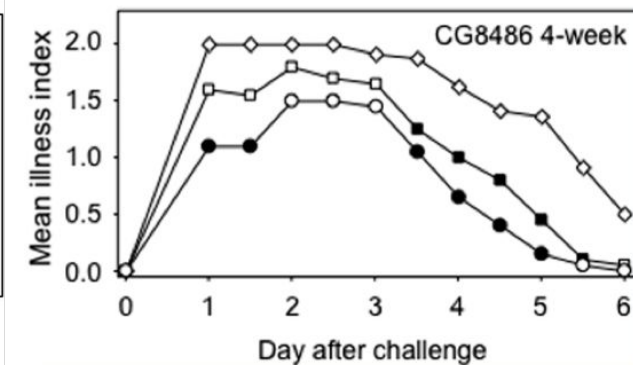
CPS (HS 23/36 strain)
and (HS 4)

Diphtheria toxin
subunit



Symbols: triangles, 1 µg; squares, 5 µg; filled circles, 25 µg; open circles, PBS.

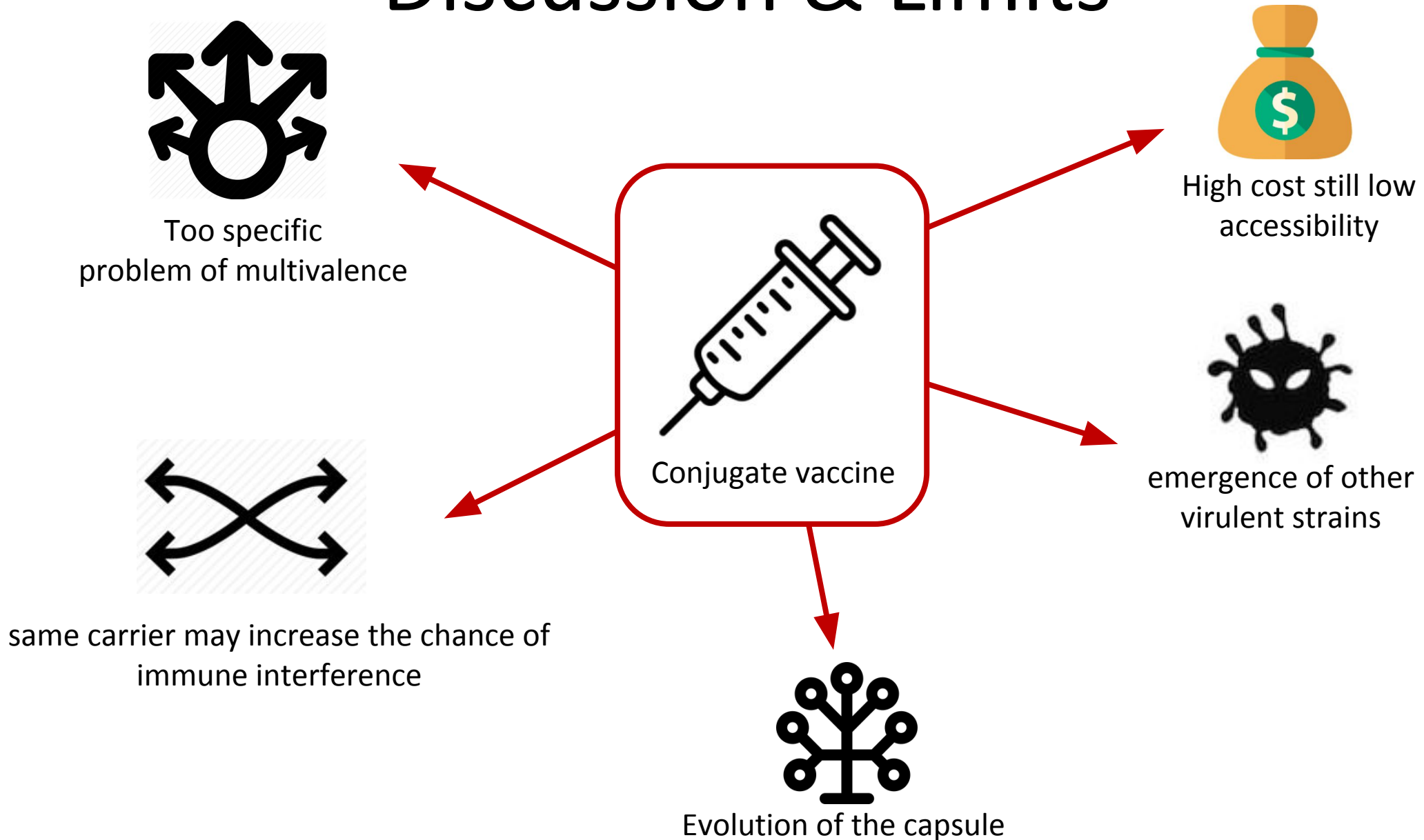
=> Long-Term protection



Symbols: diamonds, PBS; squares, 5 µg; circles, 25 µg.

=> Immunogenicity

Discussion & Limits



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