

# A Novel Approach to Salmonella Prevention

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# OVERVIEW

- Brief Review of SRP Technology
- Challenge Study Data
- Subclinical Field Study Data



# SRP=Siderophore Receptors and Porins



# *Salmonella* Newport Bacterial Extract Vaccine

- Mode of action of SRP vaccines is different from that of the whole-cell bacterins (commercial, autogenous, or core antigen)
- Made from siderophore receptors and porins, specialized proteins on the outer membrane of the bacteria
- *Salmonella* Newport Bacterial Extract vaccine controls infection and reduces fecal shedding of salmonella



# *Salmonella* Newport Bacterial Extract Vaccine

- For the control of salmonellosis in cattle
- Novel SRP<sup>®</sup> technology
- Partnership between AgriLabs and EpiTopix



# *Salmonella* Newport Bacterial Extract

## SRP<sup>®</sup> Vaccine Concept & Mode of Action



# Iron is Essential for Bacteria

- Bacteria must obtain iron from their environment to survive
- Iron drives bacterial metabolic pathways
- Without iron, bacteria cannot replicate, attach, or infect
- Lack of iron has a bactericidal effect

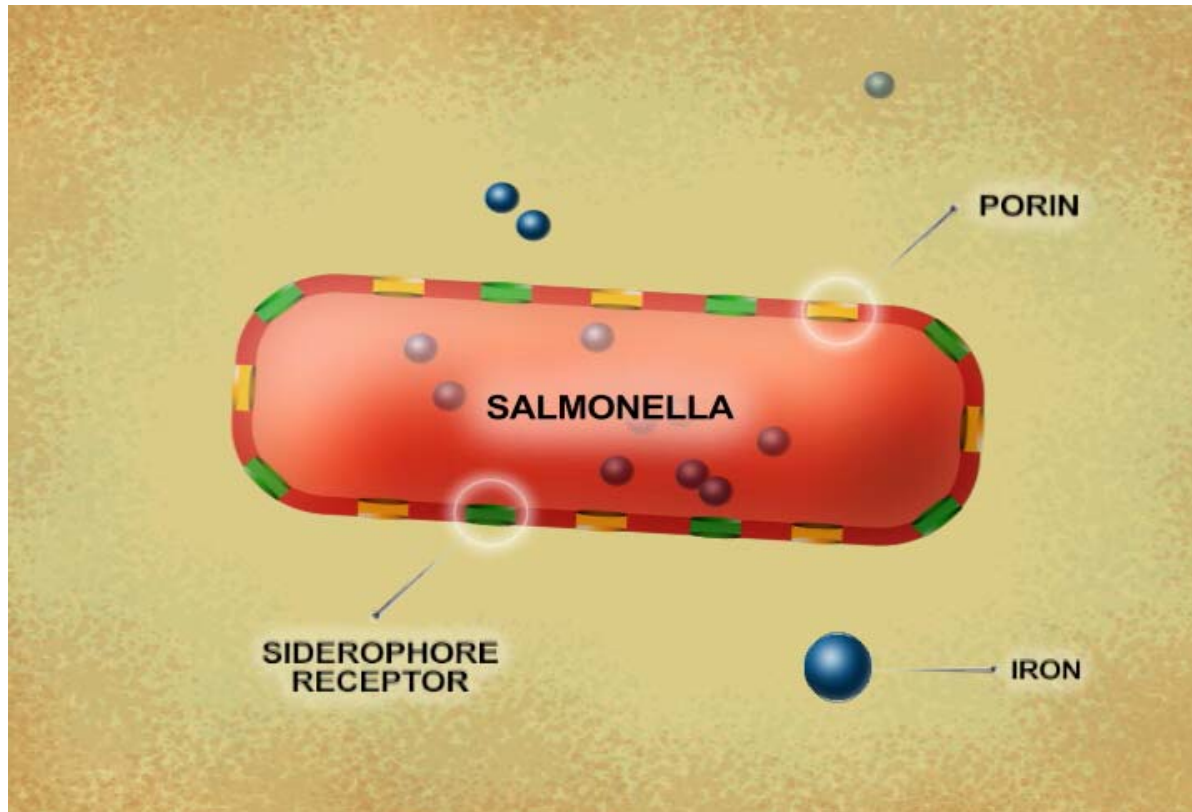


# Bacterial Iron Acquisition

- When salmonella bacteria are in a low-iron environment such as inside an animal host, they secrete small proteins called **SIDEROPHORES** which take iron away from the host binding proteins
- At the same time, **SIDEROPHORE RECEPTORS** form on the outer membrane of the bacteria. These specialized proteins accept the iron-bearing **SIDEROPHORES**, allowing them to carry essential iron into the cell



# Siderophore Receptors and Porins

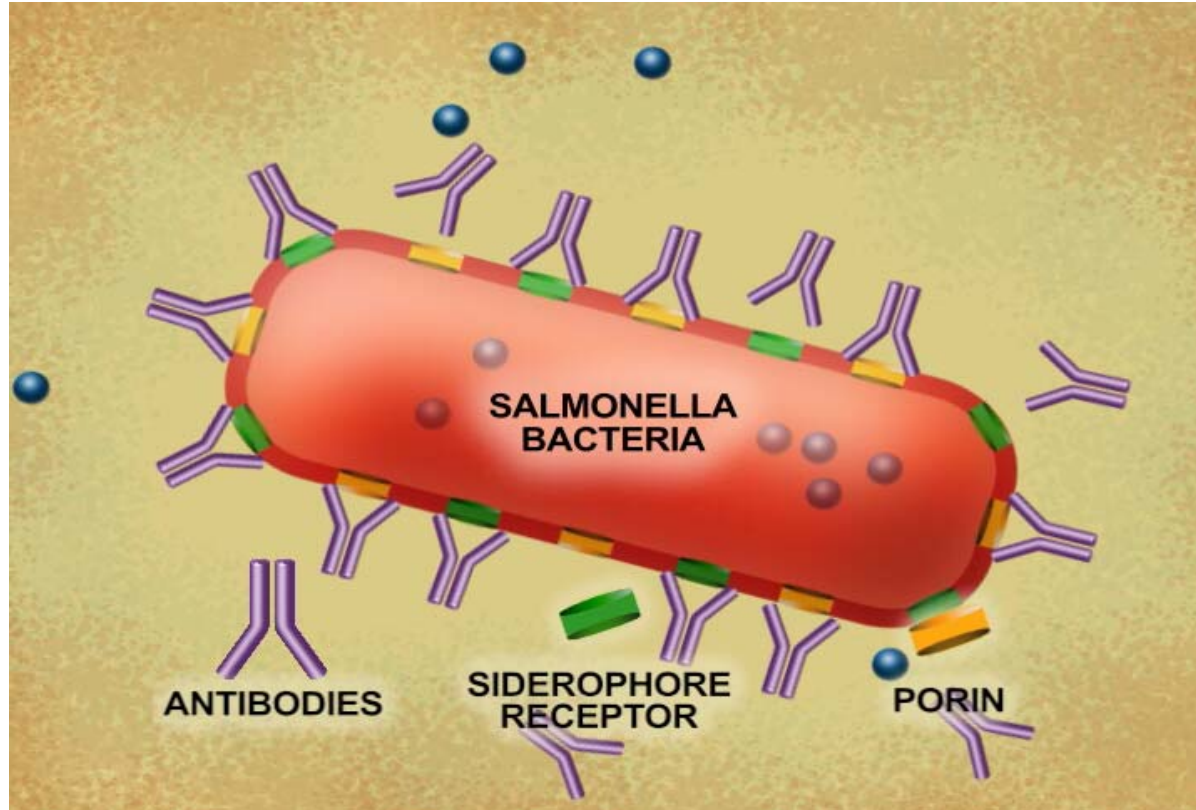


# Mode of action

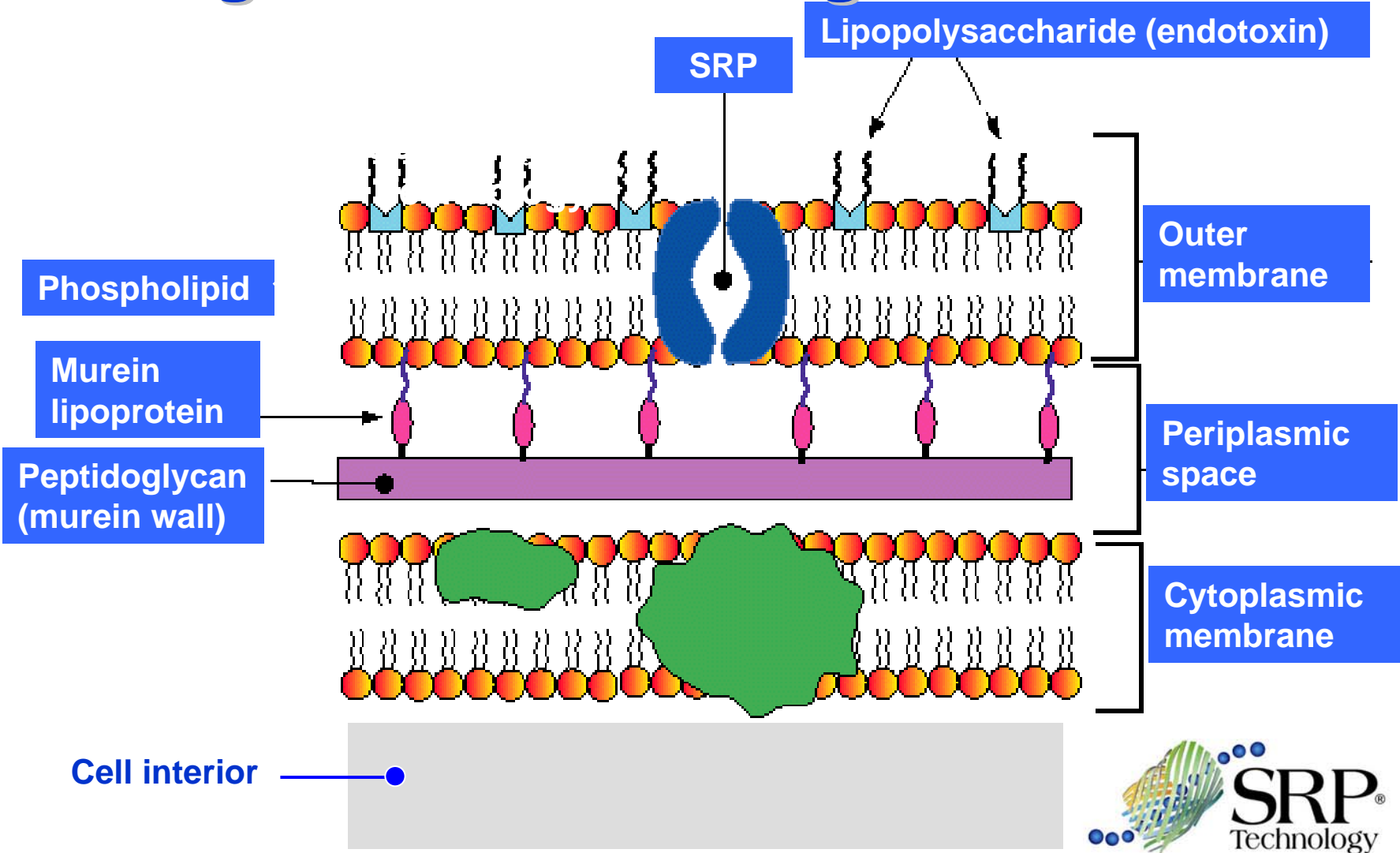
- *Salmonella* Newport Bacterial Extract vaccine consists of highly purified SRPs as antigens, resulting in antibodies against the cell wall pores
- These antibodies block the pores from transferring iron into the bacteria, stopping growth and multiplication and starving the salmonella



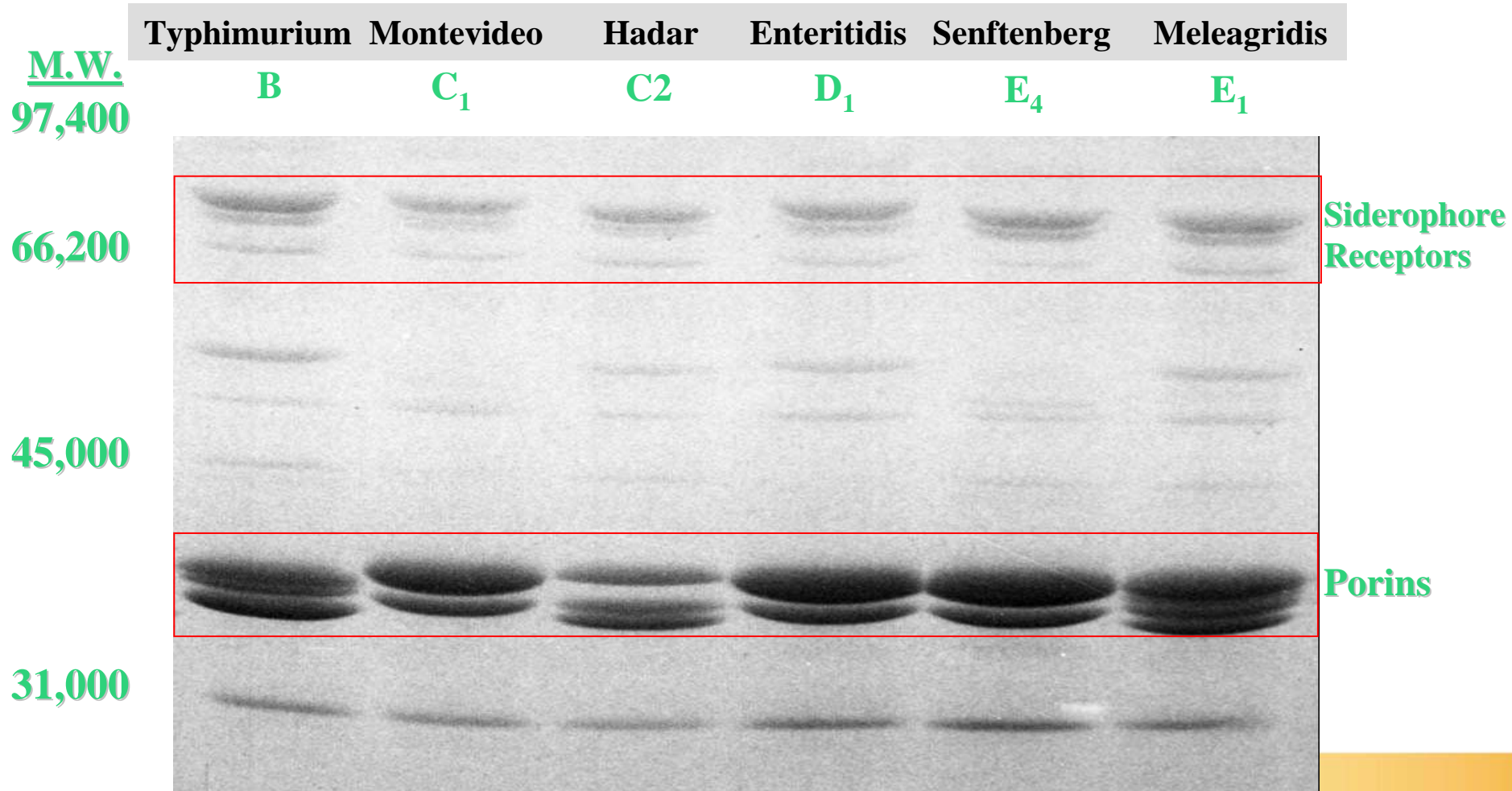
# Siderophore Receptors and Porins

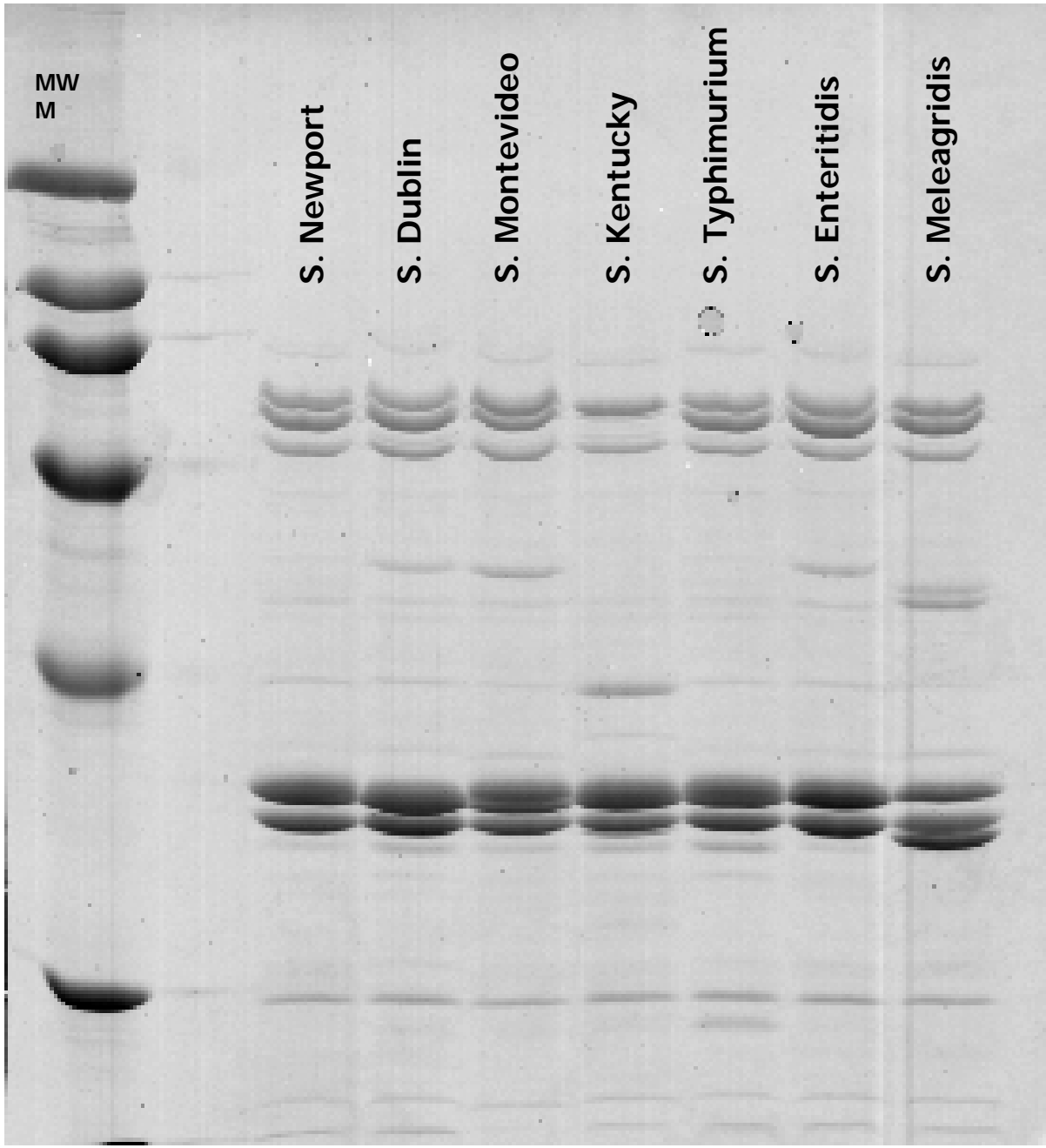


# Diagram of Gram negative cell wall



# Gel Electrophoresis Comparison of SRP<sup>®</sup> Proteins From Different Serogroups of *Salmonella*





# Cross-Reactive Nature of SRPs

- **SRPs** are identical between the members of the *Salmonella enterica* species
  - Different salmonella serotypes all have the same SRPs (Dublin, Typhimurium, Newport,...)
  - Salmonella serotype is determined by the somatic "O" antigens
- Antibodies against the SRPs of any one salmonella serotype have been shown to cross-react against the SRPs of other salmonella serotypes

