What is Klebsiella?
- Gram-negative facultative bacteria
- Found on almost all dairy herds
- Significant environmental mastitis pathogen, especially in larger herds
- Heat resistant on dairy as bacteria can die quickly
- Upon death, bacteria release a diffuse biofilm causing devastating disease in dairy cattle
- Significant pathogen in human medicine as well
- Two major pathogens:
  - Klebsiella pneumoniae
  - Klebsiella oxytoca

Bacterial iron acquisition
When bacteria encounter a low iron environment, such as inside an animal's body, they become virulent proteins called siderophores which bind iron at the best binding sites. In the same way, bacteria express pore-like proteins called porins which allow iron to be taken out of solutions through the cell wall.

What is SRP® Technology?
SRP® is a broad-spectrum receptor and pore technology:
- Pore: proteins in the cell wall that allow iron and other metals to enter the cell
- Siderophore receptor: a specialized protein located on the bacterial cell wall that binds iron in fluids and secretions

How does it work?
- Iron is required for growth
- Virulent proteins called siderophore proteins
- Vaccination creates antibodies to block transfer of iron
- Encourages the colonization of virulent SRP proteins
- Vaccination is a good tool to be used as part of a whole herd solution with dairy farm management

The mode of action SRP® vaccines differs from that of cellulose vaccine with SRP antigens being:
- SRP® vaccine binds in bacteria and other organisms on the mucosal membrane.
- The SRP® vaccine binds to iron and other metals through a number of proteins, significantly reducing the number of organisms.
- SRP® vaccines are more effective than other vaccines.
- SRP® vaccines are more effective in preventing infections.

The importance of iron
- An essential metal for cellular metabolic functions
- Essential for iron, copper, and iron, to have special protein systems to bind, transport, and store iron in fluids and secretions
- To cause scale death, bacterial pathogens must competitively acquire protein-bound iron from the host. Binding site for transferrin, lactoferrin, heme, and non-heme iron proteins

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Vetoquinol, your partner in the prevention and treatment of clinical mastitis
Choose the first—and only—Klebsiella mastitis vaccine
Vetovax® SRP®, the ironclad solution.

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References

Vetoquinol®SRP
KLEBSIELLA PNEUMONIAE BACTERIAL EXTRACT
Vetoquinol SRP® vaccine for cattle and other animals on the mucosal membrane.

VEA® Products

For more information, visit Vetoquinol.ca.
**Klebsiella Vetovax® SRP**: ironclad solution against clinical mastitis. Keep your cows in the herd longer.

**Klebsiella Vetovax® SRP** is a vaccine that uses the novel siderophore receptor and porin (SRP) technology and is made from Klebsiella pneumoniae bacteria that has been shown to be effective for the treatment of mastitis.

### Key features of Klebsiella mastitis

- **Environmental coliforms**: mastitis
- **Proper hygiene is critical for prevention**
- **Bacteria enter the mammary gland via the udder**
- **Control of the coliforms is key**

**Vetovax** is the traditional bacterin to help you keep cows in the herd longer.

**Vetovax** SRP is a new technology high-quality vaccine that addresses the challenges of Klebsiella pneumoniae—now available from Vetoquinol.

### General conclusion of the study conducted by Iowa State University

- **Vetovax SRP** is a vaccine that uses the novel siderophore receptor and porin (SRP) technology and is made from Klebsiella pneumoniae bacteria that has been shown to be effective for the treatment of mastitis.