



MICREOS

## Changing the way we combat bacterial infections: Dutch biotech Microeos launches first bacteria-killing enzyme for human use against MRSA

- Endolysin Staphefekt™ shown to kill *Staphylococcus aureus*, including MRSA
- Emergence of endolysin resistance is not expected
- Beneficial bacteria left unharmed
- The latest data are being presented at *Antibiotic alternatives for the new millennium*, EuroSciCon meeting (5<sup>th</sup> November) in London.

London, 5<sup>th</sup> November 2014

Microeos, a Dutch biotech company, has developed Staphefekt™, a bacteria-killing enzyme specific to *Staphylococcus aureus*, which is equally effective in killing methicillin-resistant *Staphylococcus aureus* (MRSA) as methicillin-susceptible *Staphylococcus aureus* (MSSA).

Staphefekt™ is the first endolysin available for human use<sup>1</sup> on intact skin. Endolysins are enzymes that originate from bacteriophages (or phages), microorganisms that kill only bacteria. In nature, phages use bacteria to replicate, in the process destroying the bacterial cell wall with endolysins. The working mechanism of endolysins is unrelated to that of antibiotics, meaning even bacteria resistant to antibiotics are susceptible.

Staphefekt™ exhibits several other characteristics: rapid killing (lysis) of the target bacteria and very limited likelihood of emerging resistance, as it works independent of the bacterial metabolism - which harbours the resistance mechanisms - and targets a region of the bacterial cell wall less susceptible to mutation. An additional feature is that its action is specific to *S. aureus* and does not affect beneficial bacteria<sup>2</sup>.

Dr Bjorn Herpers, Clinical Microbiologist, MD, PhD at Public Health Lab, Kennemerland, speaking at *Antibiotics alternatives for the new millennium* in London said:

“The results are exciting, and demonstrate the potential this technology has to revolutionise the way we treat certain bacterial infections. With the increasing prevalence of multidrug-resistant bacteria, new strategies for the treatment of bacterial infections are needed. As well as being less prone to resistance induction than antibiotics, endolysins destroy only their target bacterial species, leaving the beneficial bacteria alone.”

In vitro and observational in vivo studies, presented today in London, have confirmed these characteristics. Laboratory results have shown that lysis of *S. aureus* by Staphefekt™ is specific to *S. aureus*, efficient, and unlikely to induce resistance<sup>2</sup>.

Observational patient case series have demonstrated similar efficacy. In one case series, after the local application of Staphefekt™ for one week, *S. aureus* was eradicated from the lesions of *S. aureus*-positive rosacea patients, while other commensal skin inhabitants (such as *S. epidermis*) remained present. In another case series, *S. aureus* was found in six skin cultures before treatment (three patients with constitutional eczema, two with contact dermatitis and one with peri-oral dermatitis). In five of six patients, symptoms diminished during treatment with Staphefekt™, and patients reported less or no need for corticosteroids.

Mark Offerhaus, Microcos CEO added: “With the introduction of Staphefekt™, we enter a new era in the fight against antibiotic resistant bacteria, targeting only the unwanted bacteria. This is a far more logical and elegant approach. Millions of people stand to benefit. That’s very exciting and gratifying.”

Current data demonstrate efficacy of Staphefekt™’s bacteria-killing action<sup>2</sup>. Microcos has started clinical trials for new therapeutic areas, and is looking to collaborate with clinicians internationally to establish further trials.

– ENDS –

**For more information or to secure an interview with Dr. Herpers please contact:**

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**References**

- 1) Microcos data on file
- 2) Herpers BL, Badoux P, Pietersma F, Eichenseher F, Loessner MJ. Specific lysis of methicillin susceptible and resistant *Staphylococcus aureus* by the endolysin Staphefekt SA.100™. 24<sup>th</sup> European Congress of Clinical Microbiology and Infectious Diseases, Barcelona 2014

**Phages**

A bacteriophage (phage) is a bacterial virus that infects and replicates within a bacterium. Every bacterial strain has co-evolved to have phage counterparts which depend on the host bacterium to survive and proliferate. Phages utilise the host bacterium to replicate and produce progeny (new) phages which exit the bacterial cell following cell wall lysis (bursting), to find new bacteria to infect.

**Endolysins**

Phages produce enzymes which have the ability to target specific components on a bacterial cell wall, resulting in lysis of the bacterium and therefore cell death. These enzymes are known as endolysins.

### **About Dr Bjorn Herpers**

Bjorn Lars Herpers was born on February 16th 1974 in Schaesberg. In 1992 he graduated summa cum laude at Gymnasium Rolduc in Kerkrade, and studied medical biology, and later medicine, at the University of Utrecht. He graduated cum laude in medical biology in 1999 and obtained his medical degree in 2001. After one year of residency in internal medicine at Gooi-Noord Hospital under supervision of prof.dr. D.W. Erkelens† and dr. P. Niermeier, he switched to a residency in medical microbiology at the University Medical Center Utrecht and the St. Antonius Hospital Nieuwegein under supervision of prof.dr. J. Verhoef and dr. B.M. de Jongh. During his residency, he started to work on his thesis on genetic polymorphisms in MBL and L-ficolin, two complement-activating pattern recognition receptors. In 2009 he became a medical microbiologist and joined the staff at the Regional Public Health Laboratory Kennemerland in Haarlem.

### **About Microeos**

Microeos develops antibacterial solutions based on phage technology as a replacement for antibiotics in health care, veterinary medicine, the food processing industry and agriculture. The company has production facilities in Wageningen and Bilthoven. Microeos has a long-term cooperation with the Swiss technology institute ETH in Zürich. Gladskin is a Microeos Human Health brand for people with skin problems. In The Netherlands and Germany over 10,000 people with skin conditions with an infectious component, such as acne, eczema and rosacea, have used Staphefekt™ in creams and gels, with a user satisfaction rate of over 80% (see: [gladskin.com](http://gladskin.com)).

Microeos has also developed FDA-approved products for food safety against *Salmonella* (SALMONELEX™) and *Listeria* (LISTEX™).

See [www.micreos.com](http://www.micreos.com) for further information.