



### VALUE PROPOSITION:

Potent antimicrobial compounds effective against Gram-positive bacteria such as methicillin-resistant *Staphylococcus aureus*, also known (MRSA)

### KEY FEATURES AND BENEFITS:

- Potent antimicrobial compounds.
- Selectively effective against Gram-positive bacteria.
- Improved pharmacodynamic properties compared to the natural products carvacrol and thymol.
- Suitable for combating gram-positive bacteria in humans and animals.

### MARKET

Anti-microbial market including disinfectants, anti-microbial coatings, pharmacological compositions.

### STATUS

UK patent application filed 22nd March 2018 (GB1804628.4)

### OPPORTUNITY

Licensing Opportunity.

## Anti-microbial compounds

Antimicrobial resistance (AMR) in bacteria poses a serious and growing threat to human and animal health. Several commentators believe that the world may be facing a "post-antibiotic" era where society may no longer be able to rely on the effectiveness of antimicrobial agents and medicines for maintaining public health. Some recent predictions indicate that by 2050 antimicrobial resistance will be the major cause of death in the world's population, causing approximately 10 million deaths per year, unless new effective antimicrobial agents are developed. One strain of multidrug resistant bacteria which is particularly prevalent in hospital acquired infections and also more recently in community acquired infections, is methicillin-resistant *Staphylococcus aureus* (also known as MRSA). MRSA causes infections in the skin and more serious infections in the blood, lung or urinary tract. The ongoing increase in MRSA infections results in longer hospital stays and also an increase in mortality of patients. There is therefore a pressing need for the development of new antimicrobial agents with activity against MRSA and other Gram-positive bacteria such as *Listeria* and *E. hirae* which are also known to be responsible for severe food poisoning outbreaks and hospital acquired infections respectively.

Researchers at University College Dublin (UCD) in collaboration with researches within the University of Lisbon (U Lisboa) and the Instituto Superior Técnico (IST) in Portugal, have developed a series of antimicrobial compounds based on the anti-microbial derivatives found in the essential oil of oregano (namely carvacrol and thymol). Through the modification of these two compounds, the researchers have discovered potent anti-microbial activity against antimicrobial resistant micro-organisms, including MRSA and other Gram-positive bacteria such as *Listeria* and *E. hirae*.

### Technology Description

Several known essential oils have been shown to have potential in the treatment of antimicrobial infections and may have a suitable safety profile for use in humans and animals. One such essential oil is oregano oil, the major active components of which are the phenolic components carvacrol and thymol. Carvacrol and thymol are known for their wide spectrum of biological activity such as anti-inflammatory, anti-leishmanial, anti-oxidant, hepato-protective and anti-tumoral activities. In particular, carvacrol and thymol have been shown to be effective in combating biofilm-grown *Staphylococcus aureus* and *Staphylococcus epidermidis* bacterial strains.

Researchers in UCD in conjunction with collaborators in the University of Lisbon and the Instituto Superior Técnico have developed a series of compounds (along with a process for their production) having even greater

activity against gram positive bacteria than their natural carvacrol and thymol counterparts. Furthermore, the compounds advantageously have higher specificity for Gram-positive bacteria, compared to other strains of bacteria. The compounds have improved pharmacodynamic properties compared to their natural derivatives.

These compounds may be suitable for use in the treatment of infections caused by gram positive bacteria. The compounds may also be suitable for use in medical or personal care applications, for example coating of medical instruments and/or devices to prevent bacterial growth, disinfecting surfaces in healthcare or food preparation settings, in oral care compositions, in hand sanitizer or soap compositions, in antibacterial wipes or in plasters used in burns units.



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Licensing Opportunity

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