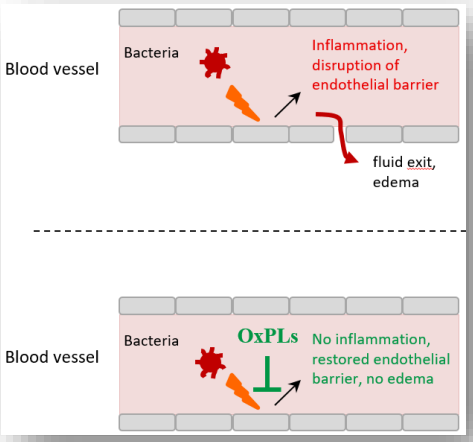
TECHNOLOGY OFFER

PHOSPHOLIPIDS FOR TREATMENT OF INFLAMMATION AND LUNG EDEMA

Sepsis induced by Gram-positive or/and Gram-negative bacteria is a leading cause of death in developed countries and the most common cause of death among critically ill patients. Respiratory tract is the most common site of infections that are associated with the highest mortality. The acute respiratory distress syndrome, which is characterized by a combination of lung edema and acute inflammation, continues to be a major health care problem. University of Graz and University of Chicago offer unique lead compounds simultaneously targeting sepsis as well as lung edema due to their unique pharmacological mode of action.

BACKGROUND

The incidence of severe sepsis in the United States, is estimated to be 300 cases per 100 000 population (> 0.5 million cases per year), with at least a third being lethal. Acute respiratory distress syndrome is affecting more than 190 000 people in the US annually with a mortality of up to 45% depending on the severity of the illness and co-morbidities.



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TECHNOLOGY

The technology describes chemically modified phospholipase-resistant phospholipids that demonstrate simultaneously two types of activities. First, these compounds inhibit activation of Toll-like receptors (TLR) 4 and 2 by components of Gram-positive and Gram-negative bacteria and demonstrate protection from lethal sepsis in animal models. Second, these compounds enhance endothelial barrier in lung vessels, reverse the action of mediators causing edema and prevent formation of lung edema in vivo. This polypharmacological mode of action can make these compounds especially effective for treatment of severe infections often leading to the development of lung edema.

ADVANTAGES

- New polypharmacological mode of action: the same molecules act as TLR antagonists and protectors of endothelial barrier
- Unique double-specific TLR4 and TLR2 antagonists: may be especially effective in prevention and treatment of lung edema induced by polybacterial sepsis
- Protection of lung endothelial barrier is stronger and significantly more long-lasting than by currently known barrier protectors; several candidate receptors were identified
- Increased biostability due to phospholipase-resistant bonds; pharmacokinetic data in mice are available; effective also as a PEGylated formulation
- Simple synthetic procedure; preliminary data on SAR suggest directions for pharmacological optimization
- The chemical structure allows simple linking of variable small molecules and drugs to the phospholipid scaffold thus increasing their half-life and pharmacological effect

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KEYWORDS:

TOLL-LIKE RECEPTOR ANTAGONISTS

LUNG ENDOTHELIAL BARRIER PROTECTION

SEPSIS

LUNG EDEMA

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COOPERATION OPTIONS:

LICENSING AGREEMENT

RESEARCH COOPERATION

DEVELOPMENT STATUS:

PRE-CLINICAL COMPOUNDS

STATUS OF PATENTS:

EUROPEAN PATENT granted (EP3661602; validated in GB, FR, DE, BE, CH, AT, IE)
US PATENT granted (US10,954,255)
CANADIAN PATENT pending (CA3,071,476)

REFERENCE NUMBER

2016_11

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