

Technology Opportunity, Ref. No. UB-15/380

New anti-biotic compounds, effective against resistant Gram-negative species

Branched (“dendritic” or “dendrimeric”) peptides have been conceived that show promising antibiotic properties, including on difficult to treat multi-resistant clinically relevant strains of Gram-negative bacteria such as *P. aeruginosa* and *A. baumannii*. The compounds have successfully been tested with skin progenitor cells on bandages for severe burns (ref. 3) and have additionally shown angiogenetic properties. Resistance formation was much slower than comparable antibiotics.

Keywords antibiotic, resistance, gram-negative

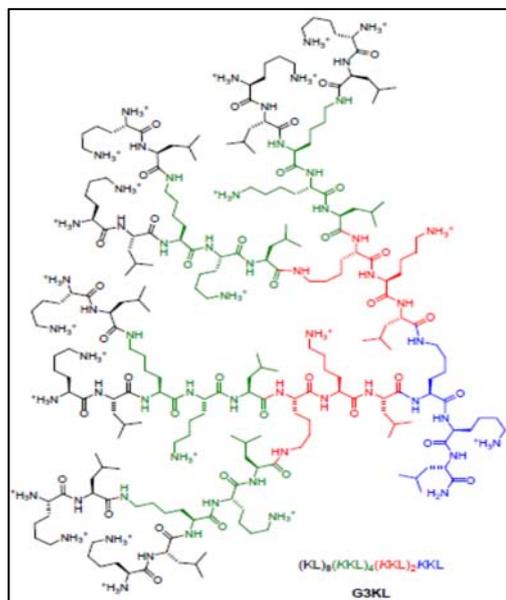
Inventors Tamis Darbre, Jean-Louis Reymond, Michaela Stach, Dept. of Chemistry and Biochemistry, University of Bern

References

1. Stach M. et al., *Angew. Chem. Int. Ed. Engl.* 2014 Nov 17; 53 (47):12827-31.
2. Pires J. et al., *Antimicrob. Agents. Chemother.* 2015 Oct 12; 59:7915–7918.
3. Abdel-Sayed P. et al., *NATURE Scientific Reports*, 2016 Feb 25 (online pre-publ., see also Infection-fighting bandages for serious burns: New technology aimed at reducing the death rate among victims of serious burns, *Science Daily* and similar news feeds)

Invention New dendrimeric peptides that show high activity against a large panel of (multi-) resistant, clinically relevant strains of *P. aeruginosa* and *A. baumannii* (refs. 1 and 2) have been synthesized by solid phase peptide synthesis (SPPS). The antibiotic effectivity of the lead compounds has been verified in co-operation with the Institute of Infectious Diseases of the University of Bern and clinicians from several university hospitals

Figure in right Panel: Chemical structure of current lead compound



Results The activity of the lead compound (MIC) is 2-4 µg/ml for PAO1 (*P. aeruginosa* wildtype) and 4-8 for a panel of > 60 investigated resistant strains. The MIC value does not change in Mueller-Hinton medium with 30% human serum and degradation in the presence of serum is slow with 60% of the compound present 24h after incubation. The lead compound shows low toxicity to red blood cells (minimal haemolytic concentration of 840 µg/ml), CHO and epithelial cells. In a recent study (ref. 3) the dendrimers proved to be effective against *P. aeruginosa* when applied to biological bandages for the treatment of severe burns. In addition to the antibiotic properties, a positive effect on angiogenesis in the progenitor cell cultures was surprisingly found, too.

IP Status Internat. Appl. WO 2015/144928, priority date: March 28, 2014.

Contact Unitectra, Technology Transfer University Bern, Dr. Martin Binggeli, Hochschulstr. 6, CH-3012 Bern, +41 31 631 32 31, mail@unitectra.ch