

UniCat Collqouium

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Developing novel antibiotics against Gram-negative pathogens

The development and dissemination of bacterial pathogens that are resistant to numerous antibiotics is a global public health threat. Novel compounds and/or therapeutic strategies are imperatively required to address the challenge that, especially Gram-negative, pathogenic bacteria constitute. I will discuss lantionine ring shuffling with lantibiotics and high throughput screening to develop novel antimicrobials, employing the large combinatorial space provided by lantibiotic ring structures. Second, I will show that we can potentiate lantibiotics by tail engineering against Gram negative pathogens. Finally, synergy of short outer-membrane perturbing peptides with vancomycin or nisin against Gram-negative pathogens will be discussed. Here, 9 Gram-negative outer membrane-penetrating peptides (GNPs) were chosen to be commercially synthesized and tested against 5 selected important Gram-negative pathogens either alone or combined with nisin or vancomycin. The results revealed that GNPs exerted a very effective synergistic effect when combined with nisin or vancomycin. The concentration of each compound that was needed to inhibit the growth of Gram-negative bacteria was dramatically reduced (up to 40-fold). Next, we identified the combinations (GNP-D8 and vancomycin, GNP-D6 and vancomycin) with strong activity against a panel of sensitive and resistant clinical isolated Gram-negative pathogens. No toxicity against HEK-293 (Human embryonic kidney) cells and non-hemolytic effect towards human red blood cells (hRBCs) were found. Overall, this approach is a highly promising way to expand the diversity of resources and strategies for the treatment of Gram-negative infections as well as increasing efficacy, decreasing the possible toxicity of antimicrobials and lower the rate of Gram-negative pathogens to be drug-resistant.

Wednesday, August 01, 2018 at 5:15 PM

TU Berlin, Institute of Chemistry
Straße des 17. Juni 115, 10623 Berlin

Building C, Lecture Hall **C 264**

Prof. Dr. Neubauer (TUB)

Organizer

Coffee and cake will be served 30 minutes before the lecture. Guests are cordially invited to attend!
Prof. Dr. Matthias Driess - Chair of the Cluster of Excellence UniCat - www.unicat.tu-berlin.de

