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# Antimicrobial activity of chemerin-derived peptide p4 is dependent on dimerization through disulfide bonds

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**T**he epithelium secretes a variety of antimicrobial factors that play a role in eliminating pathogenic microorganisms. We have recently characterized antimicrobial activity of skin-localized protein chemerin that was primarily known for its properties to support immune cell infiltration to inflammatory sites and to regulate differentiation of fat cells. An internal 20-amino acid peptide V66-P85 (p4) exhibits most of the antimicrobial activity of active chemerin *in vitro* and inhibits growth of a broad range of microorganisms, including skin, lung or oral cavity associated bacteria as well as fungal pathogen *C. albicans*. Here we demonstrate that p4 exhibits toxic activity against MRSA strains and limits the growth of *S. aureus* in experimental model of topical skin infection. Using chemically synthesized p4 sister peptides we demonstrate critical role of cysteine and positively charged amino acids for antimicrobial activity of p4. Dimerization of p4 through C-mediated crosslinking was found to be crucial for either binding to bacteria or bacteria killing, suggesting that p4 acts as antimicrobial agent under oxidized conditions. Fluorescence

microscopy, TEM and immunogold labeling revealed that mechanisms of p4 action involve membrane and intracellular off-membrane targets and that p4 triggers rapid bacteria death by compromising membranes integrity. Our data gives important clues as to how the p4 exerts lethality on bacteria. Since p4 displays rapid lytic activity against skin pathogens but not human erythrocytes, p4 holds the promise to improve treatment of skin infections.

## Biography

Urszula Godlewska received her BSc and MSc Degree in Biology (specializing in Microbiology) in 2012 from the University of Wrocław. Her Master's thesis under the guidance of Dr. Bożena Futoma-Koloch focused on the strategies of multiple host complement system evasion by *Salmonella*. In 2014, she joined Professor Joanna Cichy's research group at Jagiellonian University as a PhD student. She is currently working on a project which examines the role of antimicrobial peptides derived from chemerin in immune host defense.

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