A small step closer to a save new antibiotic

An important fundament of our so called modern medicine are substances that are save for humans to take but deadly for bacteria. They are known as antibiotics. Interestingly, most of these have their origin in microbes, using them to defend their ecological niche against other microbes. Since microbes are around since more than 3 billion years, they had plenty of time to come up with various strategies to develop such antibiotics and also to counteract them, becoming what we call now resistant. Media has already reported that more and more of this very important drugs fail because the pathogenic bacteria become resistant. In the near future it become a reality once again that people die by a simple cut, that got infected. All operations will be extreme high risks since infections could not be controlled anymore. Slowly awareness level rises for this problem and the race to find alternative antibiotics, before all old ones are not working anymore, has already begun.

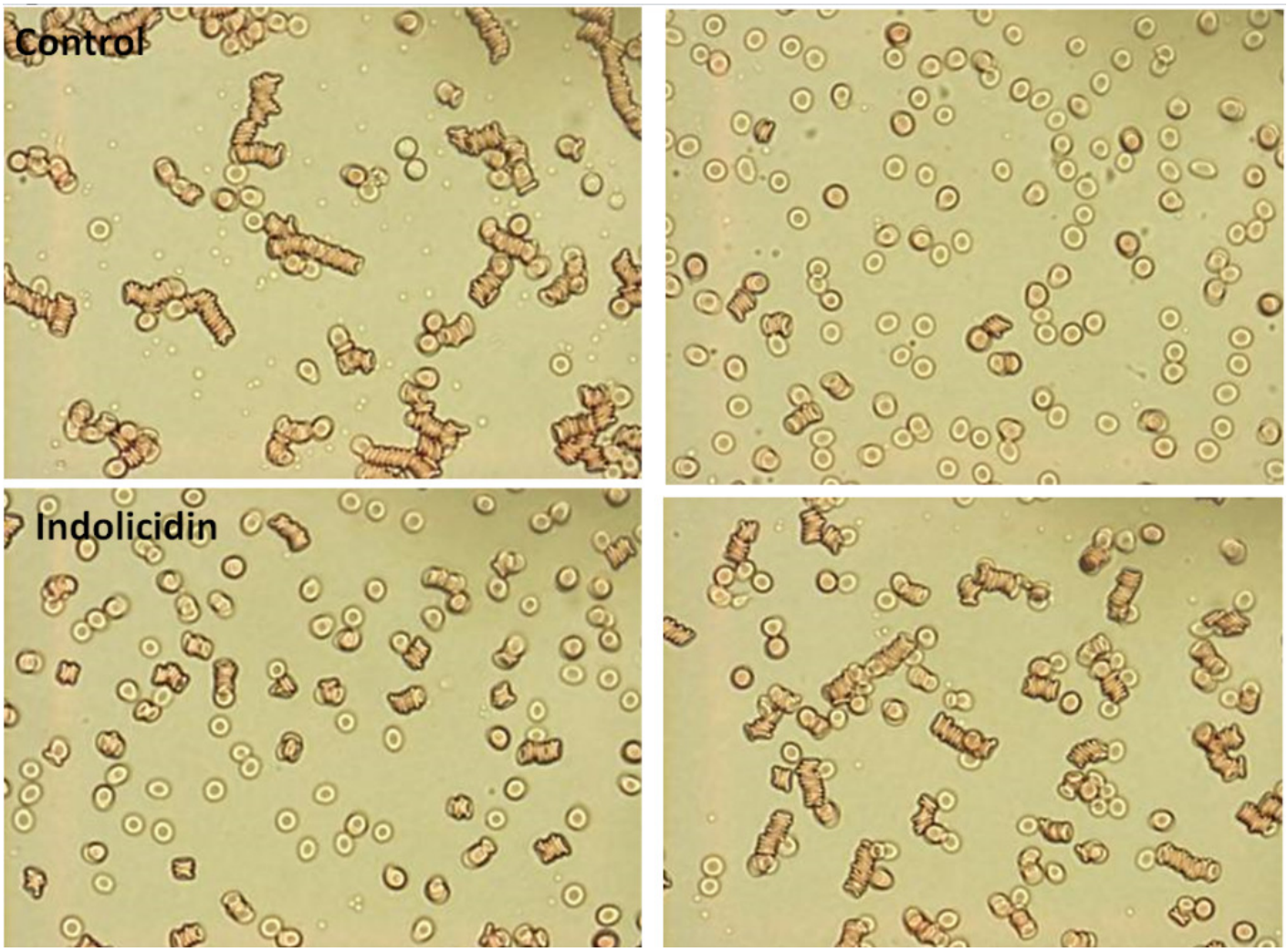

Fig. 1. Red blood cells morphology after incubation with phospate buffer (control, top left),

indolicidin a peptide from cow(bottom left), LL-37 a peptide from humans (top right), and W3 a short designed peptide. Citrate anticoagulated whole blood was mixed with peptide with a final concentration of 0.05 mg/ml.

A class of substances researcher are working on is called antimicrobial peptides. They can be found in all kind of plants and animals including humans. Researcher have already discovered that these peptides work differently then conventional antibiotics and could therefore be a good candidates for novel drugs. However, they can not be taken orally but only by injection. Doing this such peptides come into contact with blood right away. We were asking the question, are there any effects on some of the important function of the components in the blood. We looked for red blood cell lysis, aggregation, platelet activation, blood coagulation, and complement activation. All these activities are markers for serious side effects. We selected a few peptides from a class that is important in humans and animals, and in addition some peptides designed by Dr. Kai Hilpert. Our data shows that some of the peptides did interfere with important blood functions and it is therefore important in drug design to test such interference early on. We anticipate that this new knowledge on blood interaction of antimicrobial peptides will help to design peptides with a better therapeutic window and with less side effects.

Publication

Interaction of blood components with cathelicidins and their modified versions.
Yu K, Lai BF, Gani J, Mikut R, Hilpert K, Kizhakkedathu JN
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