Science and Technology Park
Palacký University Olomouc

Technology Offer

Restoration of Antibiotics Efficacy Against Resistant Bacterial Strains

Field of Application

- Human medicine
- Veterinary medicine
- Medical instruments
- Cosmetic industry

Inventors

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Technology Status

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Summary

The treatment of systemic and local bacterial infections by means of commonly used antibiotics represents a significant medical problem caused by an increasing resistance of pathogenic bacteria towards antibiotic treatment. Therefore, this problem was intensively studied by researchers from Palacký University in Olomouc and suggested possible solution. Invented solution is based on using of combination of antibiotics, and silver in the form of nano- or microparticles or in the form of silver compounds.

Technology Advantages / Potential Applications

The antibiotic in combination with silver or silver compound shows again an antibiotic effect against those resistant bacteria, against which the same antibiotic, but free of silver, does no exhibit antibacterial effect. Moreover, such combination of an antibiotic and silver achieves the properties of broad-spectrum antibiotics even if the antibiotic alone does not belong among broad-spectrum antibiotics.

Key Facts by WHO

Antimicrobial resistance is present in all parts of the world. For an idea, in 2013, there were about 480 000 new cases of multidrug-resistant tuberculosis (MDR-TB). MDR-TB requires treatment courses that are much longer and less effective than those for non-resistant TB. The second example are treatment failures due to resistance to treatments of last resort for gonorrhoea (third-generation cephalosporins) have been reported from 10 countries. Gonorrhoea may soon become untreatable as no vaccines or new drugs are in development.

Escherichia coli		
Tested substance	**Concentration**	**Growth**
ciprofloxacin	2	+
	8	+
	16	+
ciprofloxacin + NanoAg	2 + 3	-
	0.1 + 5	-
	0.05 + 5	-

Enterococcus faecium		
Tested substance	**Concentration**	**Growth**
vancomycin	4	+
	8	+
	16	+
vancomycin + NanoAg	1 + 3	-
	0.5 + 5	-
	0.1 + 5	-

Restoration of antibacterial effect of antibiotics against resistant bacteria strains due to the effect of silver nanoparticles.

+ bacteria grows; - bacteria does not grow

Institute of Origin