

Phage preparation for rectal use



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Future of the medicine

Polish Patent: PL 214743B16

One from the inventors

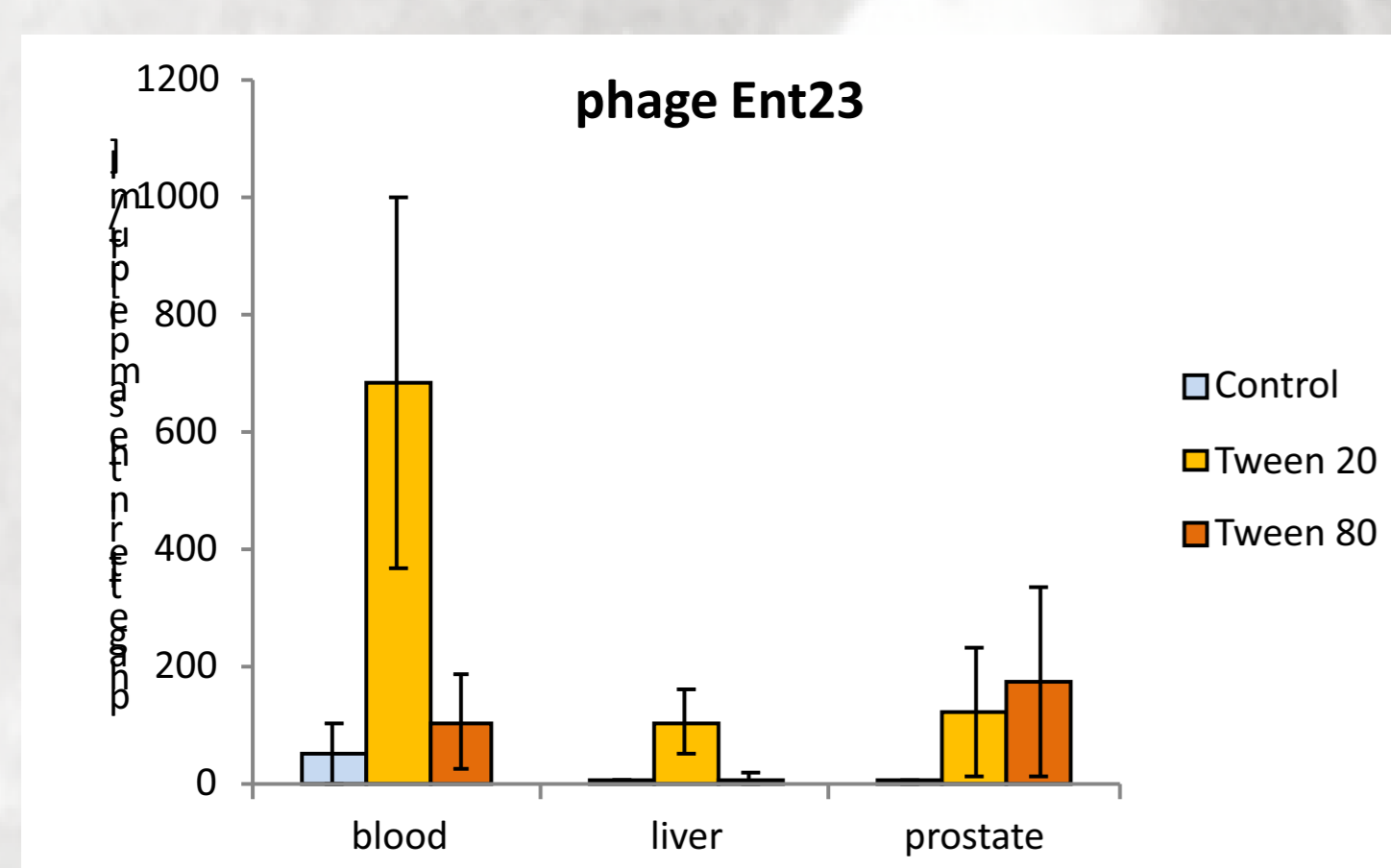
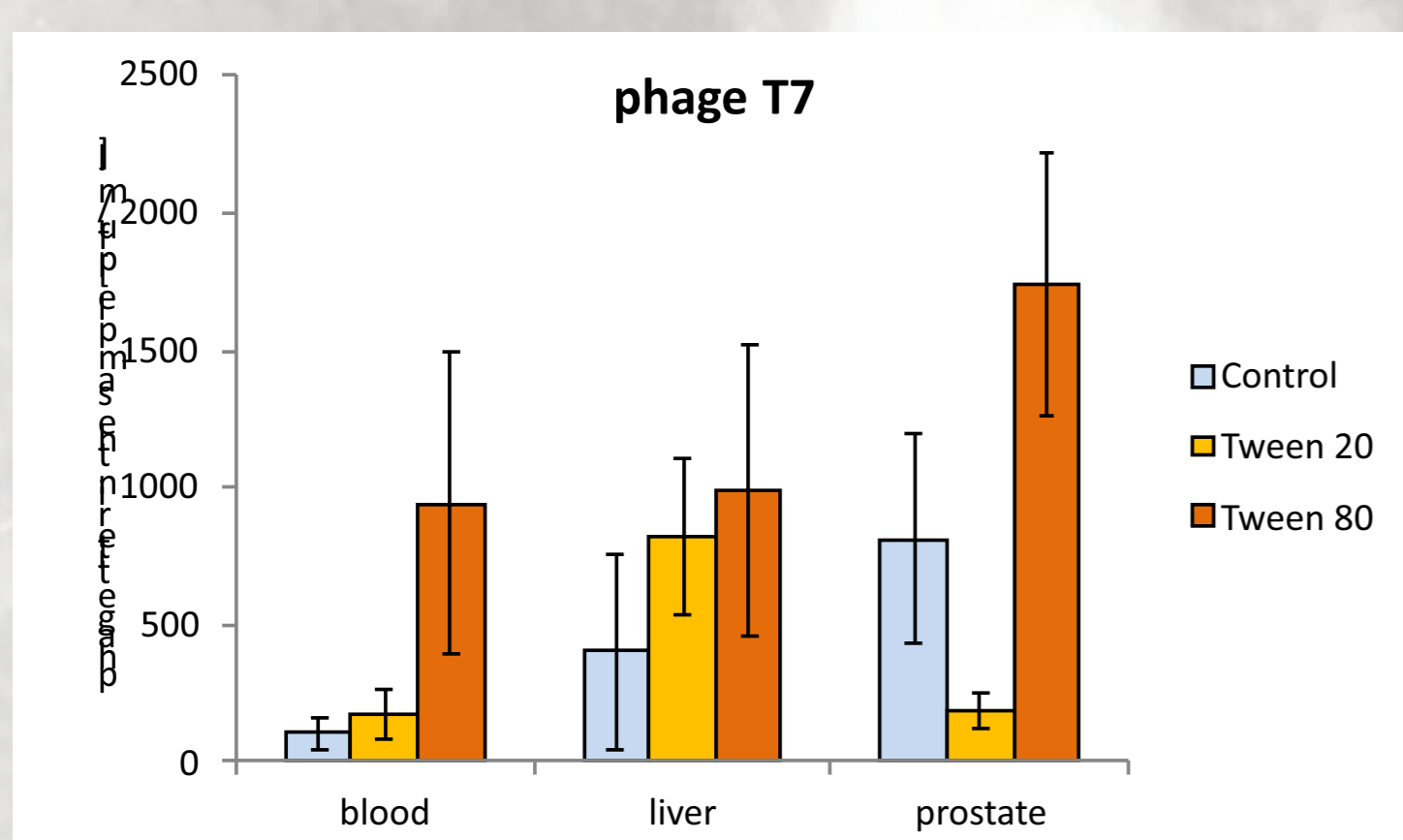


Figure 1. Effect of Tween 20 and Tween 80 on the penetration of bacteriophages into the blood, liver and prostate of rats after rectal administration. Phage preparations contained 5% surfactant. Blood and organs for phage titer determination were collected after 60 min. from their application. A group of control animals received a phage preparation with the addition of 5% broth on which the phages were propagated. Mean phage titers in tissue samples and standard deviation are shown. The groups consisted of 4 animals.



Based on the obtained results (results are shown in Figure 1 and Table 1), it was found that adding Tween 20 or Tween 80 to a preparation containing bacteriophages had a positive effect on increasing the amount of phages in the blood, liver and prostate tissues. In the case of the Ent23 phage, the addition of 5% Tween 20 or 80, compared to the phage preparation with the same addition of broth serving as a control, increased the average titre of phages in the blood at least twofold, caused the appearance of phage in the liver and increased their titer in the prostate gland more than a hundred times. In the case of T7 phage, the addition of 5% Tween 20 or 80 increased the phage titer in the blood by 60% to over 900% and in the liver over 100%. The addition of Tween 20 to the T7 phage preparation decreased its penetration into the prostate, but the addition of Tween 80 more than doubled it. It should be emphasized that the test, in which the titre of phages in samples was determined, detects only active phages, i.e. those capable of lysing bacterial cells. It follows that the addition of Tween 20 or Tween 80 to the preparation containing bacteriophages not only did not inhibit the activity of phages in tissues, but also favorably increased the amount of phages showing the ability to kill bacteria.

Application possibilities:

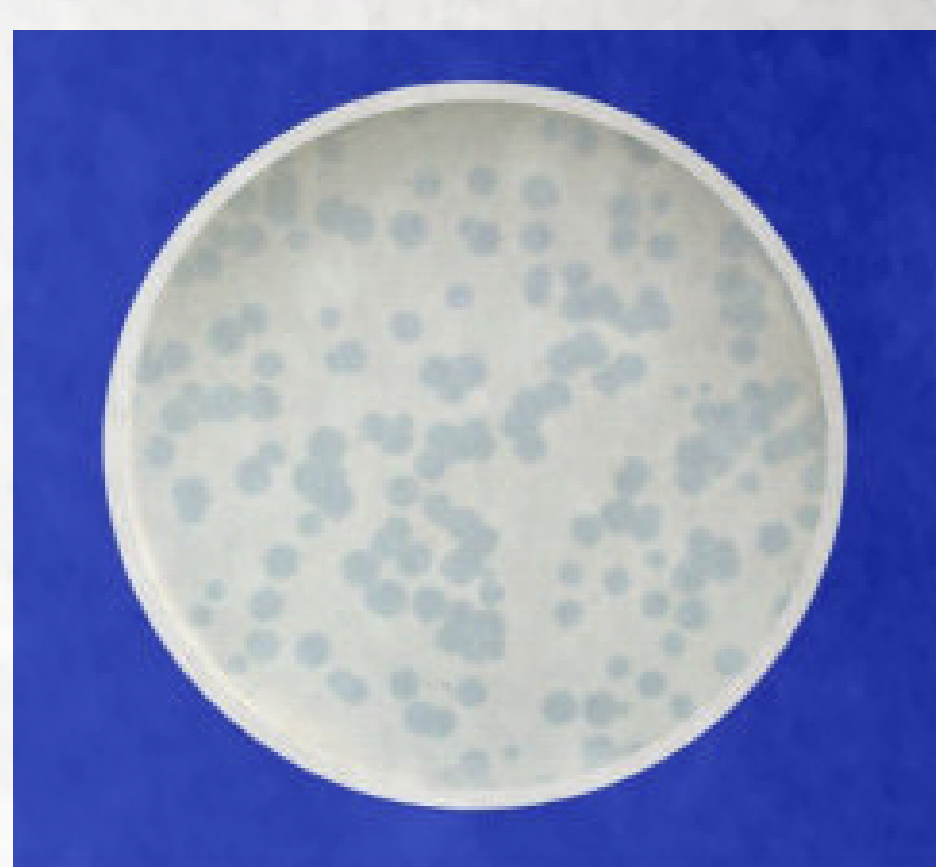
As a rectal composition (enemas, reticoles - microenemas, rectocapsules, suppositories, gels, creams and ointments) containing bacteriophages and Tween 20 (or Tween 80) for rectal use in the treatment of bacterial infections in humans and animals, in particular for the treatment of infections of female and male organs genitals, especially chronic bacterial

Bacteriophage penetration into prostate tissue

Międzybrodzki R., Letkiewicz S., Kłak M., Bubak B., Jończyk E., Weber-Dąbrowska B., Górski A.: Bacteriophage penetration into prostate tissue and its implication for the phage treatment of chronic bacterial prostatitis. *First International Congress on Viruses of Microbes, Paris June 21-25, 2010*

Table. Bacteriophage penetration into the blood, liver and prostate tissue of rats 30-60 min. after rectal administration of phage lysates.

Phage	dose [pfu]	number of animals	Phage titer in sample [pfu/ml]		
			blood	liver	prostate
M13	10 ¹⁰	3	460 ±58	1931 ±966	1035 ±414
T7	2,5×10 ⁹	4	58 ±48	8 ±1	102 ±50
Ent23	1,25×10 ⁹	7	26 ±21	26 ±17	12 ±5
Ent13	5×10 ⁹	4	0 ±0	73 ±41	150 ±112



Plaques (double-layer agar technique) of enterococcal phage isolated from homogenized rat prostate tissue 30 min after intravenous administration of 5×10⁸ phage particles.



Phage therapy of antibiotic-resistant bacterial infections as a therapeutic experiment

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