

Bacteriophages (or phages) are the most abundant organisms in the biosphere (Clockie 2011). They naturally exist e.g. in oceanic waters, sewage waters, etc. (Clockie, 2011, Muniesa, 1998) and in animal and human organism (Puig, 1999). The most important thing which characterizes this group of viruses is the fact that they infect only prokaryotic cells – bacteria (Duckworth, 2002). Phages are unable to infect mammalian cells, but they are constantly present in human organism (Weber- Dąbrowska, 2001). Phages are postulated as safe for humans and animals (Rakhuba, 2010, Górski, 2009) which provides a great opportunity to use them in human treatment in cases of bacterial infections (Sulakvelidze, 2004). It is crucial to learn as much as possible about phages and their interactions with human bodies to make phage therapy safer more effective. Nowadays – the times of antibiotic-resistant bacteria – the fact that phages can be a good alternative of effective antibacterial therapy makes phages interesting for scientific research. As we know, effectiveness of phage therapy is high in infections caused by various drug-resistant bacteria (Burrowes, 2011). Bacteriophages are widely applied in therapy in the Phage Therapy Unit ([http IITD PAN](http://IITD.PAN)). It is also known that phages are highly significant - yet underappreciated – element of human and animal natural microbial flora (Letarov, 2009). However, phages have not yet been fully described and one of poorly understood aspects is the ability of phage to interact with mammalian cells. Thus, there is an important gap in the current knowledge. We propose to address that need by investigating phages – mammals interactions. There is an abundance of phages in the human digestive tract, they are permanently present in the intestine (Duerkop, 2012). The ability of phages to remain in the digestive tract suggests that phages may have special abilities to interact with mammalian cells. However, there is little data about the interaction of phages with mammalian cells, which is a significant gap in the knowledge.

The aim of the project is to obtain new knowledge of the pharmacokinetics of bacteriophages in mammals, which will contribute to a better understanding of the biology of these bacterial viruses. Furthermore, the ability of phage to penetrate tissue / organ will be characterized.

Due to the possibility of using phages in medicine, especially in times of bacterial multi-drug resistant's, the interest of scientists with these viruses increases. The most important issue is to learn the biology of these organisms; interaction with mammalian cells.