

## **Bacteriophage derived products should be encouraged as a direct or indirect options for disease targeting-promoting awareness for their safer applications.**

**Swapnil Ganesh Sanmukh and Sérgio Luis Felisbino\***

Laboratory of Extracellular Matrix Biology, Department of Morphology, Institute of Biosciences of Botucatu, Sao Paulo State University (UNESP), Sao Paulo, Brazil

*Accepted on June 05, 2017*

The continually escalating applicability of nanotechnological approaches for targeted treatment and therapies for various diseases, including cancer, demands, safety criteria supported by wide range of studies beyond ethical measures; showing its effective utilization without having hazardous effects on other cells than target disease. At present, many new nanoparticles have been synthesized which are demonstrating effective results against various cancers. Due to their effectiveness and manual control over its production their applications are well accepted, many are undergoing clinical trials and some have completed it successfully. Similarly, as per patents filed by various reputed research groups and companies, it seems that synthesizing new chemical compound followed by its patenting looks profitable [1]. However, we are sidelining an important nanoparticle which is naturally available and can be controlled in terms of production criteria for animal or human applications too! Bacteriophages are used in various fields including medicine for their various important applications (for example, phage display, phage therapy, phage-based drug/protein/peptide delivery) [2,3]. Even after been commercialized and licensed in 1940s by Eli Lilly and Company (US), for its use as a natural drug to treat bacterial infections; it has been undermined for other applications since the onset of the antibiotic era. Here, we would like to ask for our research community to encourage and demonstrate the awareness for its safe use as an option for internal medicines for targeting various diseases, such as cancer. In the last few decades, few studies reported the use of bacteriophages with modifications, hybrids or with chemical/metallic conjugates against few diseases and some types of cancers [2,4,5]. Moreover, the main concern about using bacteriophages in humans is related to its viral origin. Our only appeal to the publisher and to the researchers is to wholeheartedly report and support safer applications options for targeting different diseases by phage-based products or modified/hybrid phages. For promoting awareness about bacteriophages, its efficacy and efficiency through research articles, research notes, reviews, mini-reviews, short communications, commentaries, etc. is important for establishing its regulatory approval from crucial agencies like World Health Organization (WHO), United States Food and Drug Administration (USFDA) and European Medicines Agency (EMA) [6-8].

### **References**

1. Roy K, Singh N, Kanwar RK, et al. Survivin Modulators: An Updated Patent Review (2011 - 2015). *Recent Patents on Anti-Cancer Drug Discovery*. 2016;11:152-69.
2. Gorski A, Dabrowska K, Switala-Jelen K, et al. New insights into the possible role of bacteriophages in host defense and disease. *Med Immunol*.
3. Citorik RJ, Mimee M, Lu TK. Bacteriophage-based synthetic biology for the study of infectious diseases. *Curr Opin Microbiol*. 2014;19:59-69.
4. Luo CH, Shanmugam V and Yeh CS. Nanoparticle biosynthesis using unicellular and subcellular supports. *NPG Asia Materials*. 2015;25(7):e209.
5. Petrenko VA, Gillespie JW. Paradigm shift in bacteriophage-mediated delivery of anticancer drugs: from targeted “magic bullets” to self-navigated “magic missiles”, *Expert Opinion on Drug Delivery*. 2016.
6. Verbeken G, De Vos D, Vanechoutte M, et al. European regulatory conundrum of phage therapy. *Future Microbiology*. 2007;2(5):485-91.
7. Verbeken G, Pirnay JP, De Vos D, et al. Optimizing the European Regulatory Framework for Sustainable Bacteriophage Therapy in Human Medicine. *Arch Immunol Ther Exp*. 2012;60:161.
8. Verbeken G, Pirnay JP, De Vos D, et al. Call for a dedicated European legal framework for bacteriophage therapy. *Arch Immunol Ther Exp (Warsz.)*. 2014;62:117-29.

### **\*Correspondence to:**

Dr. Sérgio L Felisbino  
Department of Morphology,  
Sao Paulo State University (UNESP),  
Sao Paulo,  
Brazil  
Email: felisbin@ibb.unesp.br