Editorial

iMedPub Journals
www.imedpub.com

Nano Research & Applications
ISSN 2471-9838

2021
Vol.7 No.1:2

Editorial Note on Bacterial nanotechnology

Tarun Vinnakota

Department of Microbiology, Bengaluru

Received: December 28, 2020; **Accepted:** December 08, 2020; **Published:** January 08, 2021

***Corresponding author:** Tarun Vinnakota

tarunvinnakota@gmail.com

Department of microbiology, Bengaluru.

Citation: Vinnakota T (2021) Editorial Note on Bacterial nanotechnology. Nano Res Appl Vol.7 No.1:2

Editorial

As with any scientific discovery, the bacterial system of CRISPR-Cas9 is the product of the joint feat of multiple researchers spanning nearly 30 years of study. These attempts have shown that CRISPR-Cas9 is a general immune system used by bacteria to combat a viral attack. After being invaded, bacteria insert fragments of viral DNA into their genomes, generating a recollection of the event that causes successive invasions of the CRISPR-Cas9 machinery. The molecular mechanism of how the device operated remained elusive for a long time, however. It was only in 2012, published for a short time in two seminal independent papers, that the winners of this year's Kavli prize identified how Cas9 nuclease, led by two artificially fused RNA molecules, recognizes and cleaves unique DNA sequences from invading organisms. Subsequent studies from other groups showed that the CRISPR-Cas9 method could also be used in eukaryotic cells to sever a sequence of DNA preference. At this point, the scientific community completely realized that a genome editing tool that could be used in a range of applications was at its disposal.

The technique's beauty and strength lies in its relatively simple programmability and flexibility, making it more accessible, but also raising concerns about the absence of regulations on its use. While other techniques of gene editing involve laborious efforts in protein engineering to adapt the method to different gene sequences, The knowledge about its specificity in CRISPR-Cas9 is encoded in the RNA guide, which can be easily programmed to recognize any DNA stretch. Such features have turned CRISPR-Cas9 into the workhorse of molecular biology in laboratories worldwide, such as, It enables the investigation of gene function or the development at a fraction of the time taken by old-school protocols of unique animal models, speeding up research at unprecedented speeds. Since 2012, there has been a sustained increase in the number of scientific publications in the field, Companies selling CRISPR kits or CRISPR-modified cell lines on demand have mushroomed, and modern biotech and 'gene programming.' The new system's promises are fantastic. For example, in medicine, it could enable the correction of defective genes in otherwise incurable genetic diseases, Clinical trials for cancer treatment have already begun in China and the first ex vivo genome editing trials will begin in Europe and the United States for β-thalassemia and sickle cell anaemia. Technology may also revolutionize other areas. CRISPR-Cas9 could deliver crops more resistant to adverse conditions in agriculture, And in energy, it could lead to increased biofuel output by genetically engineered organisms. The technology could promote gene drive in the area of infectious diseases, a technique that aims to regulate the number of pathogen-carrying species by spreading genome alteration in a population. For example, scientists seek to apply this technology to slash the population of malaria-transmitting mosquitoes, but there are worries about the effect that this might have on the ecosystem.

The use of CRISPR-Cas9 as a human genome editing method presents the scientific community with significant social and ethical issues, as its deliberate or accidental misuse and the emergence of potential private interests may lead to destructive and dire consequences. Since the technique can be used for human embryo alteration, In order to draw lines that determine what should be done and what can never be done with technology, strict regulations should be placed in place. Indeed, several scientists signed a moratorium a few years ago to facilitate continuous discussion of the ethics involved in gene editing and to mandate that some investigation lines of CRISPR-Cas be suspended before the device and its drop are better elucidated and the regulatory apparatus catches up with research with appropriate guidelines and safety measures.

Some scientists go back to the bench to find out more about the fundamentals of the method as the ethical controversy continues and the number of patents using this technology rises. Researchers want to understand, in particular, how the mechanism has evolved, as well as understand its off-target effects and how to minimize them. For molecular biology applications that go beyond gene editing, some researchers have upgraded it to an even more precise cutting unit, engineering Cas9 proteins that can modify a gene at the level of a single base (the so-called base editors), and others have modified it. In addition, numerous CRISPR-Cas systems have been established, with different preferences and

functions for the substrate. The implementation of CRISPR-Cas12 and CRISPR-Cas13 systems for the identification of viral DNA at extremely high sensitivities has recently been shown by three distinct classes. A property that could contribute to the design of low-cost portable devices in resource-limited environments for the detection of infectious diseases.

The CRISPR-Cas example shows that engaging in fundamental science to understand the natural world's inner workings is essential to finding new solutions to human challenges. Nature is a reservoir of future technologies; it is up to man's persistent and innovative mind to discover them and to make responsible use of them.