

# Vaccine up to Date: RNA Vaccines and RNA Immunotherapeutics

**Ibrahim Mohammad Saeed Shnawa\*** 

UBLISHERS

University of Qasim, Iraq

**\*Corresponding author:** Ibrahim Mohammad Saeed Shnawa, College of Biotechnology, University of Qasim, Qasim, Babylon, Iraq, Tel: 07800188929; Email: ishnawa@yahoo.com

## **Editorial**

MEDWIN P

The body of human being is considered as a sort of biological system. Such system ends up to building blocks, the cells. These building blocks stand as a miniaturized biological system that contained an array of several kinds of bio-macromolecules like proteins, carbohydrates, lipids. and nucleic acids. These cellular biomacromolecules, in turn act as molecular machines inside the cells [1]. At the 1970s of the 20th century the breakthrough in the biological community had been the discovery of the biology of DNA [2], while at the early 21st century the breakthrough has been the biology of RNA [3]. Traditionally, RNA can be typified as; mRNA, tRNA, rRNA and snRNA which are mainly involved in gene expression regulation and protein synthesis [4]. What emerging is that some RNAs posses an array of several immune functions. Thus, the theme which I, hold that the long non-coding and some coding RNAs have increasing discovered and to be discovered immune potentials (Table 1). The today notion holds that long non-coding RNA functioned as regulators of infection processs, immune response to infections, tumorogenic and tumorocidal processes, and vaccine immune-adjuvants [5]. As well as the coding RNA act as vaccines. Therefore, what promising now is that coding and long non-coding RNA vaccine and vaccine adjuvants which are still in their infancy state [6], suggest an optimistic prospectus pinpointing that these RNA vaccine preparations are promising for prophylaction and /or treatment (Tables 2-4) of some infectious and cancerous diseases [7-10]. May and may not be we are still in life witnessing of the integration of the biology of RNA, biology of DNA (Since DNA vaccine were already known) with current vaccinology and to a step further towards Nucleic acid vaccines as main branch in continuum with the current molecular vaccines.

## **Tables**

mRNA	Preventive and therapeutic RNA vaccines
Coding miRNA	Immune regulation on innate and adaptive immunity.
Noncoding miRNA	RNA vaccine immunoadjuvants
	Regulation of development and function of Immune cells and
	Regulation of innate and adaptive immune response.

Table 1: The immune functions of RNA [8-10].

### Editorial

Volume 1 Issue 1 Received Date: July 6, 2016 Published Date: July 13, 2016 DOI: 10.23880/vvoa-16000102

Viral Infection	Influenzae, Rabies, HIV.
Bacterial	Tuberculosis.

Table 2: RNA vaccines for infectious diseases in preclinical phase [6].

Preventative and therapeutic cancer vaccines
Melanoma
Lung cancer
Prostate cancer
Check point inhibitor, siRNA

Table 3: RNA based preventive and therapeutic cancer vaccines preclinical and limited clinical phase [6].

Preparation of RNA vaccine, stabilization, naked or encapsulated.	
Manipulated into APC, transcribed, and translated into protein of vaccine specificity	
Triggering the TH0 and activated into TH1, TH2 which in turn activate naive B cell.	
Clonal expansion of effector antibody producing, and memory B cells	
Immune conversion of baseline vaccine specific antibody to clinical vaccine specific	
antibody titres that may mediate immune protection	

Table 4: Immune mechanisms behind RNA vaccine in vaccinated (6).

#### References

- 1. Clegg CJ (2000) Introduction to advanced biology, Murray, London, pp. 9-24.
- Wilson R, Walker J (2010) Principles and Techniques of Biochemistry and Molecular Biology. In: Keith Wilson & John Walker (Eds.), (7<sup>th</sup> edn), Cambridge University Press, Cambridge, pp. 138-262.
- Wahid F, Shehzad A, Khan T, Kim YY, (2010) MicroRNAs, synthesis, mechanisms, function and recent clinical trails, Bichemica Biophysica Acta, Molecular Cell researchs 1803(11): 1231-1243.
- 4. Lewin B (2000) Genes VII. In: Benjamin Lewin, Oxford University Press, Oxford, pp. 232-272.
- 5. Li Z, Rana TM (2014) Decoding and non-coding RNA; Prospective of Lnc RNA mediated innate immune regulation, RNA Biol 11(8): 979-985.

- 6. Hubaud A (2015) A Plog on RNA Vaccine: A Novel technology to prevent and treat diseases, Brigham and Womens Hospital, Harvard Medical School.
- 7. Sayour EJ, Sanchez-Perez L, Flores C, Mitchell DA (2015) Bridging infectious disease vaccines with cancer immunotherapy: role of RNA based immunotheraputics. J Immunother Cancer 3: 13.
- 8. Ansel KM (2013) RNA regulation in the immune system. Immunol Rev 253(1): 5-11.
- 9. Geng H, Tan XD (2016) Functional diversity of long non-coding RNA in Immune regulation. Gene & Disease 3(1): 72-81.
- 10. McNamara MA, Nair SK, Holl EK (2015) RNA based vaccines in cancer immunotherapy. J Immunol Res 794528.