

# Vaccine up to Date: RNA Vaccines and RNA Immunotherapeutics

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**Editorial**

Volume 1 Issue 1  
**Received Date:** July 6, 2016  
**Published Date:** July 13, 2016

## Editorial

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 bio-macromolecules, in turn act as molecular machines inside the cells [1]. At the 1970s of the 20<sup>th</sup> century the breakthrough in the biological community had been the discovery of the biology of DNA [2], while at the early 21<sup>st</sup> 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 possess 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 processes, immune response to infections, tumorigenic 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].

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).

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