

## Chapter 52

# Stratagems of Nanotechnology Augmenting the Bioavailability and Therapeutic Efficacy of Traditional Medicine to Formulate Smart Herbal Drugs Combating

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### ABSTRACT

*Mental illness is one of the most fundamental emotional states of conscious being which becomes unbalanced and leads to neurological disorders. It is a significant contributor to the global burden of disease and there is a strong desire to devise a remedy. Ayurveda represents a traditional medicine system of India that endorses antiquity than western medicine and relies on formulations rather than their active components. It has categorised a group of herbal medicines to improve mental abilities. Conversely, the mechanistic details of the therapy are not available in ayurvedic literature and there is a need to fortify this system with modern scientific analysis. The design of nanosystems encompasses promising characteristics in the field of drug delivery with a limited dosage thereby decreasing adverse effects. This chapter confers stratagems of devising polymeric nano herbal formulations as smart nano brain drugs to espouse mental health.*

### INTRODUCTION

The venture to maintain an optimal state of health includes both physical and mental wellbeing and a stable mind symbolizes an ideal physiology which is an imperative cause of existence. Mental health is an essential parameter that reflects the emotional, psychological and social wellbeing of an individual. Presently the populace stumble upon various emotional issues pertaining to their professional and

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personal life that evokes stress in their day today life. The unbalanced state of conscious being leads to mental disorders that erode subsistence. Trapped with pessimistic thoughts they feel hopeless and helpless thereby desire suicide as their only redeemer. Mental illnesses are a sober condition which can affect a person's thinking, mood, and behaviour. There are various types of mental illness and mental health problems, such as:

- Anxiety disorders,
- Mood disorders,
- Post-traumatic stress disorder (PTSD),
- Obsessive compulsive disorder(OCD),
- Impulse control and addiction disorders,
- Personality disorders.

Though medical field has advanced technologies, the threat of mental ailments intrudes the normal survival rate. There is a sturdy necessitate to treat these distressing conditions and fetch a remedy to stir up the universal welfare. There are several, medications available to combat mental illness but are accompanied with severe adverse effects that would lead to other physiological ailments. The advancement in modern science has to resolve the instinct of studying the context, nonclinical elements and alternative therapies required for enhancing mental health. Therefore, there is a strong desire to elevate research in the field of neuroscience with the resourceful mechanisms revealed, by manoeuvring the innovative technologies. Drug delivery is the most essential feature in drug administration facility and the design of nanosystems makes the action more consistent and appropriate. Polymeric nano particles bind efficiently to the drug and disperse the drug proficiently into the system. This mechanism significantly reduces the side effects of the synthetic drugs. Nanoscience focuses on the approaches of drug delivery in a nano scale, which needs a minimum dosage of drug than the conventional medicinal use. Nanomedicine is the medical application of nanotechnology which is considered as the future medicine. Biomedical nanotechnology, nanobiotechnology, and nanomedicine are the areas used to evolve this hybrid field of research (Figure 1).

The size of nanomaterials is similar to that of most biological molecules and structures. Therefore, nanomaterials can be useful for both *in vivo* and *in vitro* biomedical research and applications. Nanotechnology has provided the possibility of delivering drugs to specific cells using nanoparticles.

It has the following possibilities of facilitating:

- Lowered overall drug consumption and side-effects,
- Reduces expenses,
- Targeted action and develops personalized medicine,
- To improve drug bioavailability.

Drug delivery is the most essential feature in drug administration facility and the design of Nanosystems makes the action more consistent and appropriate. Drug delivery is the most essential feature in drug administration facility and the design of nanosystems makes the action more consistent and appropriate. Polymer nano particles bind efficiently to the drug and disperse the drug proficiently into the system. The efficacy of many drugs is often limited by their potential to reach the site of therapeutic action. In most cases (conventional dosage forms), only a small amount of administered dose reaches the target

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