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Translational Biomedicine: The Future of Modern Internal Medicine

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From times immemorial the central dogma of life, i.e., DNA→RNA→Protein has been respected. This forms basic element of Translational Biomedicine. Interventions need to be directed at the three distinct steps at the DNA level (if feasible) or at the RNA level (through appropriate viral mediated vectors) or at the last step where the molecular medicine experts need to develop appropriate protein counterparts which will result in physiological effects by acting as agonist or antagonist at appropriate receptors. This forms the basis of translational biomedicine. Recently the Human Micro biome project has been a great leap in this aspect.

Researchers need to select suitable phenotypic expressions with desirable genotypic transcriptional properties to generate biological proteins (receptor blockers or pharmaceutical biomolecules) which will stop the manifestation of undesirable phenotypic effects and promote the desirable ones.

Interventions at the first two stages (replication and transcription) are really difficult and cumbersome. So the impetus now is focused at the translational stage to design suitable biomolecules, proteins, viral translational products or pharmaceuticals so as to have desired effect (physiological manifestation) by appropriate, selective, receptor occupancy and stimulation or inhibition.

There is perpetual dynamic interexchange of DNA within the human genome and the micro biome genome. Scientists or the researchers need to keep in his armaments the desirable genetic expressions expressed as effective translated protein (hormones or biomolecules) so as to glorify the human genome with desirable effects through suitably transgenetic mediated bacteriophages.

Associations of different biomolecules with disease processes establish the mainstay of genetic diagnosis. Identification and quantification of these biomolecules provide insight into pathophysiology and probable areas of intervention in complex disorders. Role of micro and macromolecules have been elaborated in chronic multisystem disease processes and researchers have exploited these associations to establish diagnosis at the incipient stage where earliest possible interventions have proved to be maximally effective to alter the course of disease process and probable complications.

Recently Nano medicine has evolved as a new wing of research in the field of translational biomedicine. National Nanotechnology Initiative launched by the United States in 2000 to establish well defined set of goals for Nano medicine. Researches in Nano medicine have been focused to intricate biology of cells, health related genomics, behavior of cells in response to physiological stimuli or pathological process, complex interaction between host DNA and vectors etc. Biologically defined nanoparticles and Nano engineered probes are going to be one of the most effective tools for study and research in translational biomedicine in coming days.

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