Editorial

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Confluence of Biological Researches for Cure and Therapeutics: An Initiative from Molecules to Medicine

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In modern age large section of human society is facing ill effects of environmental stress and high morbidity due to presence of diseases, pathogens and pollutants in the surroundings. Global climate change is imposing three long range effects i.e. lethality, post disease morbidity and rising resistance in pathogens against drugs/antibiotics. There is a need to develop new methods, technologies, low toxic and safer formulations to combat insect vectors on one hand, and diagnosis methods in disease strains on the other. To find solutions of drug and pesticide resistance, novel bio-organic compounds from plant origin are to be used for making broad spectrum nano-herbal drug formulations. Complexes of green chemicals be used to fight against drug and insecticide resistance. From plant products, a series of chemo preventive anti-cancer drugs can be prepared. There is rising demand of low toxicity, safer vector control agents, herbal compounds for making therapeutic drugs and pure antigens to synthesize vaccines for encephalitis, malaria, filaria, cell culture based vaccines. Thus, for better management of communicable, life style diseases, congenital disorders and other pathogenic conditions there is a need to integrate all existing therapeutic and diagnostics methods to find mutations and prepare medicines accordingly. From researches it has been well established that plant based herbal medicines show better potential to curb on resistant pathogens. No doubt these are good alternate of less effective, old drug formulae. These are easy to catabolize, less toxic and impose no long term cumulative side effects in patients. Now green chemicals are being used to prepare non-toxic Met-NPs (metallic nanoparticles) which are easy to transfer drugs and target specific in nature. These also serve as excellent CT/photoacoustic contrast-enhancement agents and show high diagnostic specificity, usage and assist in drug assimilation from where it reaches to target organ system. For achieving better therapeutic success existing outcomes of medical, clinical and biological researches should be integrated with biophysics, molecular biology, pharmacology and bioinformatics to enhance application of various molecules to make quality medicines, ultra-modern diagnostics, and more advanced drug delivery methods. Along with the technological advancements, new judicious laws, practices, policies, aids, taxes, insurance and all-round reforms are needed to upgrade the health system.

There is another area which can assist in disease therapeutics, mainly cancer. There are several toxins/proteins and peptides isolated from animal venoms which show novel cytotoxicity to cancer cells and potentially inhibit growth of microbes. Venom toxin, short peptides and their analogues can be used to design a new generation of specific inhibitor of human angiogenesis. These can also inhibit progression of cancer and affect cyclin function. T cell proteome for wasp venom can facilitate the future development of T cell-based immunotherapeutic approaches. Development of drug delivery systems can be made by using toxin components to prepare Nano scale therapeutic devices to target brain tumors, breast, colorectal cancer and oral cancers. Encapsulated animal venoms exhibit better efficacy and act more vigorously as an anti-cancer agent against cancer and cancer cell lines. Structural modifications in venom toxins/proteins/peptides are possible which can be used to make new drug templates, which may accelerate interactions between pathogen and receptor cells. Thus, by altering hydrophobic interactions and insertion of new amino acids in active site region of toxins/proteins, more potential therapeutic drug molecules can be generated. But for finding exact reasons of a disease, structural studies are needed in the field pathology and therapeutics to establish disease causing genes and mutations in structural molecules. For better understanding, the clinical aspects of microbes and therapeutics, nature of drug, drug-receptor interactions must be fully explored. For therapeutic purposes marine plants and animals can assist as rich source for preparation of more effective pharmaceuticals of low dosage and low toxicity.

Due to increase in level of various pollutants in environment neuro-sensory problems are increasing day by day. For healing important visual, hearing, nasal and neuronal defects/disorders, new methods and therapeutic molecules are in high demand. Stem cells and their transplantation can help to retrieve sensory receptor functions. For finding quick solutions sensory-neuronal disorders, new diagnostic and therapeutic methods are needed. Besides stem cell transplantation, new biomaterials, cell scaffolds and concurrent efforts are needed. However, for restoration of pathological and congenital disorders and diseases new cell culture and transplantation

methods, biocompatible substrates, bio-matrix, and micro-niche maintaining factors are more essentially needed for repairing and healing of sensory epithelial cell successfully. For tissue repair, wound healing and regeneration there is a need to design new biomaterials to make matrix based nano-structure constructs for sensory cell. For achieving quick therapeutic solutions other than using drugs, surgery is an important method to treat a disease, cure illness and soon get rid of pathological condition. Some of the acute and chronic diseases can be cured only by surgeries.