

3rd International Conference on **Integrative Biology**

August 04-06, 2015 Valencia, Spain

Evaluating medicinal properties of the folkloric medicinal plant *Rhazya stricta* for the future development of modern therapeutic practice

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Medicinal plants assumed principle role in folkloric medicine throughout history. They have been the subject of many recent studies for the evaluation of what have been ascribed to them of medicinal properties by means of modern slandered techniques. For example *Rhazya stricta* Decne of the *Apocynaceae* family is a widely distributed plant in Saudi Arabia. Extract of its leaves is prescribed in folkloric medicine for the treatment of various disorders such as diabetes, sore throat, helminthiasis, inflammatory conditions and rheumatism. The extract contains mainly alkaloids, glycosides, flavonoids, tannins and triterpenes. Several studies on rats and mice reported that the leaves extract causes sedation, analgesia, decreases motor activity and has anti-depressant, anti-oxidant activity, complex effect on brain endogenous monoamine oxidase activity and central-mediated hypotension. Moreover, some studies ascribed anticancer activities to indole alkaloids of *Rhazya stricta*. The genotoxicity of *Rhazya stricta* leaves was demonstrated by Baeshen and colleagues in a battery of tests. We also demonstrated some other therapeutic properties of *Rhazya stricta* for the treatment of cancer, insulin insensitivity, MDRs (multi-drug resistant organisms), cardiovascular diseases, obesity and some other ailments. We are running in collaboration with some international institutes in the United States and Europe extensive studies on the whole genome of *Rhazya stricta* leading the way to future Natural Products Genomics and PDT (Phytodynamic Therapy).

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Cardiac tissue targeted delivery of therapeutic payloads successfully regresses cardiac hypertrophy abating bystander effects

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Diverse array of therapeutic regimens, drugs or siRNA are commonly used to regress cardiac hypertrophy, although, bystander effect and lower retention of bioactive molecules significantly reduce their functional efficacy. Carvedilol, a widely used drug against cardiac ailments has been reported to modulate metabolic profile of liver and glomerular filtration rate in kidney while non-targeted genome-wide knock down of *p53* gene though has been demonstrated to improve cardiac function considerably, yet leads to acute tumorigenesis all over the body thus affecting bystander organs. Therefore, tissue targeted delivery of therapeutics had been a challenge in effective treatment of cardiovascular dysfunction. This study reports a successful accomplishment of cardiac tissue engineering in our laboratory by delivering bioactive therapeutic molecules encapsulated with a homing peptide conjugated to stearic acid modified Carboxymethyl chitosan (CMC) nanopolymer to hypertrophied cardiomyocytes *in vivo*. The peptide precisely targeted cardiomyocytes while CMC served as the vector mediator to pathological myocardium. Controlled delivery of active therapeutic payloads within cardiomyocytes resulted in effective regression of cardiac hypertrophy. Thus, this novel nano construct as a spatiotemporal vector would be a potential clinical tool for developing effective therapeutic strategies within cardiac micro-environment via on-target therapeutic delivery of desired therapeutics in active form and at controlled dosage for effective management of myocardial pathophysiology.

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