

**Details of the Project sanctioned under the Human Resource Development scheme of
Department of Health Research**

1. **Project Title:** Genomic Analysis and Gene Expression Profiling of Lipolytic Probiotic isolates and their response in cardiovascular diseases.
2. **Category of fellowship:** Women Scientists with break in career (Category A)
3. **PI (Name & Address):** Dr. Madhu Rathore C/O Prof. Kanika Sharma, Course Director,
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4. **Qualifications:** M.Sc, Ph.D.
5. **Mentor or Co.PI (Name & Address):** Prof. Kanika Sharma, Course Director,
Department of Biotechnology, Mohanlal Sukhadia
University, Udaipur, Rajasthan, India-313001
6. **Duration of the project:** 3 years
7. **Broad area of Research:** Life science
 - 7.1 **Sub Area:** Biotechnology
8. **Summary of the Project:** Probiotics are commonly defined as mono- or mixed cultures of live microbes that, when applied to animal or human, possess a beneficial effect on health of the host. These beneficial effects include disease treatment and prevention as well as improvement of nutrients' digestion and absorption. Probiotic microorganisms are generally, albeit not exclusively, lactic acid bacteria (LAB) including *Lactobacillus acidophilus*, *L. bulgaricus*, *L. casei*, *L. plantarum*, and *L. rhamnosus*. However, use of other bacterial species such as *Bacillus* and *Bifidobacterium* spp, as probiotic strains has also been described in several commercial products (Chukeatirote, 2003).
Probiotics known to possess positive influence on intestinal flora, prevention of intestinal tract infections, improvement of the Immune system, reduction of inflammatory or allergic reactions, anti-colon cancer effect, blood lipids, heart disease, antihypertensive effect.

The proposed work is based on isolation of potential probiotic strains from fermented food and camel milk. Camel milk remains easily available in Rajasthan region and known for its therapeutic values. Novelty of this work is purification of probiotic lactic acid bacteria showed significant lipolytic activity as well as genomic analysis and gene expression profiling further these strains will be used to enrich food or dairy products. Furthermore, purified strain will be checked for cytotoxicity and also be checked whether strains satisfied the specified quality assurance criteria to be a probiotic or not. Quality assured strains will be used to enrich dairy products or fermented foods and test for its potentiality. Regular consumption of these foods and product will help to improve health condition. There are several probiotics in the enriched as well as formulation form available in market but probiotic which specifically used for potential lowering of serum triglyceride level and to confer resistant to infection of pathogenic microbes is not available. Thus, main emphasis of this study is purification of potent lipolytic lactic acid bacterial strain and subsequent development of probiotic enriched formulation that can be very helpful for peoples suffering from high fat level in serum and also for those people who already undergoes open heart bypass surgery and want to opt preventive measures to get rid of post complication associated with the same.

9. Objectives of the Proposal:

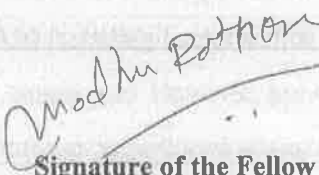
- a) Isolation, purification and molecular typing of lipolytic lactic acid bacteria strains purified from fermented foods and camel milk.
- b) Qualitative and quantitative estimation of lipase activity.
- c) In vitro tests to screen potentiality of strains for good probiotic properties.
- d) Comparative genomic sequencing analysis and gene expression pattern of isolated probiotic lipolytic strain with commercial strain.
- e) Statistical & Bioinformatics Analysis
- f) Development of formulation.

10. Innovations in the project: The proposed work is based on isolation of potential probiotic strains from fermented food and camel milk. Camel milk remains easily available in Rajasthan region and known for its therapeutic values. Novelty of this work is purification of probiotic lactic acid bacteria showed significant lipolytic activity as well as genomic analysis and gene expression profiling further these strains will be used to enrich food or dairy

products. Furthermore, purified strain will be checked for cytotoxicity and also be checked whether strains satisfied the specified quality assurance criteria to be a probiotic or not. Quality assured strains will be used to enrich dairy products or fermented foods and test for its potentiality.

11. Significance of the outcome of the project: Novel Lactic Acid Bacterial isolates with significant Lipolytic Activity would used to develop novel formulation which not only confers health benefits but also helpful for those have high Lipid Content in Serum. Synonymous Codon Usage Analysis, Gene expression profiling will add more to this study and open new revenue towards gene transferring in suitable host.

12. Relevance in Public Health: There are several unrevealed secretes of medical sciences yet to be discovered, one of them is isolation of potential probiotic bacterial strains, generally regards as safe (GRAS), from camel milk (most commonly found in Rajasthan) and fermented food which possess significant capability to hydrolyse fat as well as potent antimicrobial activity against resistant microbes. Atherosclerosis and consequently heart diseases are big problems in human beings. Main cause of this problem is increased serum lipid level. However medicines are available in market to control increased fat level but their side effects cannot be overlooked. In addition, person experienced heart attack will definitely advised for open heart cardiac surgery or angioplasty which is also cause post treatment complications as steomyelitis, skin diseases etc. Hence it is very important to keep serum fat level under control in natural ways. Need of hour is to develop safe probiotic drug which can control the percentage of a death due to deadly heart disease. The present study deals with molecular typing and characterisation of probiotic lipolytic bacteria and subsequently development of formulation with supplements.


Signature of the Fellow /Faculty
(MADHU RATHORE)