

REPORT

Report on participation of the ICMR International Fellow (ICMR-IF) in Training/Research abroad.

1. Name and designation of ICMR- IF : Dr. Maharshi Bhaswant Cheethirala
(Scientist-C)
2. Address :
Molecular Nanomedicine Research Unit,
Sathyabama Institute of Science and Technology
Jeppiaar Nagar, Rajiv Gandhi Salai,
Old Mahabalipuram Road, Chennai -600019.
3. Frontline area of research in which training/research was carried out : Techniques in Cardiovascular remodeling
4. Name & address of host and institute :
Dr. Hemant Poudyal
Assistant Professor and Hakubi Researcher
Center for Medical Education and Department of Diabetes,
Endocrinology and Nutrition,
Graduate School of Medicine, Kyoto University, Kyoto, Japan
5. Duration of fellowship with exact date : Ten months (25-12-19 to 21-10-20)
6. Highlights of work conducted
 - i) Technique/expertise acquired
Acquired adequate skills in isolated heart preparation and millar's catheterization a gold-standard technique for measuring *ex-vivo* and *in-vivo* function of left-ventricular, in the form of stiffness constant, developed pressure, contractility, heart rate and hemodynamics measurements of cardiac hypertrophy/heart failure.
 - Expertise acquired in using Langendorff, for measuring cardiac function by suturing one end of a thread to the apex of the heart and the other end to a mechanical recording device to measure isometric contractions and isovolumic pressure along the long axis of the heart.
 - Millar pressure catheters are used for measuring arterial and ventricular blood pressures.
 - ii) Research results, including any papers, prepared/submitted for publication
Blood pressure was significantly higher in fructose but not glucose-fed rats (Figure 1). SGLT inhibition had no effect on blood pressure in glucose-fed

group but effectively normalized blood pressure in fructose-fed group (Figure 1).

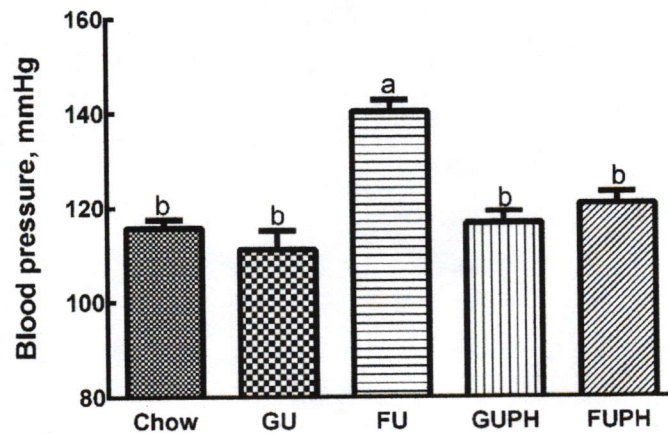


Figure 1: Blood pressure after 4 weeks feeding with in standard Chow (Chow), glucose (GU), fructose (FU), glucose+phlorizin (GUPH) and fructose+ phlorizin (FUPH)-fed rats.

Left ventricular wet weight and right ventricular wet weight did not change in any group. However, glucose and fructose supplementation induced increase in left ventricle internal dimension in diastole but not in systole and without changing posterior wall dimension (Figure 2A). Diastolic, systolic, stroke volumes and cardiac output were elevated only in fructose-fed group. Ex vivo experiments using isolated heart preparation showed similar results for selective improvement in LV contractility in glucose-fed rats supplemented with phlorizin with no statistically significant changes in other groups. Fructose but not glucose increased the LV stiffness (Figure 6B).

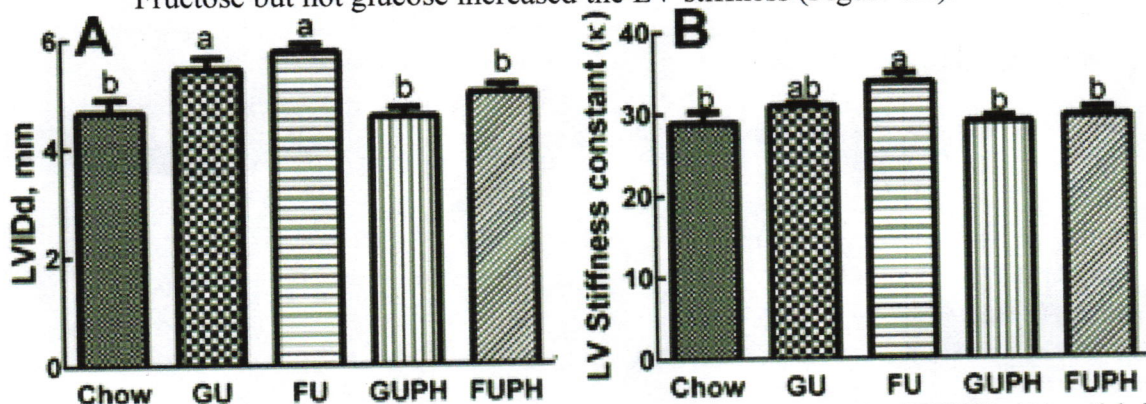


Figure 2: Changes in left ventricular internal diameter in diastole (LVIDD) (A) and left ventricular stiffness constant (B) in standard Chow (Chow), glucose (GU), fructose (FU), glucose+phlorizin (GUPH) and fructose+ phlorizin (FUPH)-fed rats. Data shown as means \pm SEM. Means without a common alphabet significantly differ.

iii) Proposed utilization of the experience in India

ICMR-International Fellowship provided me an excellent opportunity to gain expertise in the area of cardiovascular physiology. I am very well trained in

techniques which will address many research questions focusing on cardiovascular function. The gained expertise will be used in the ongoing and future research projects at Sathyabama Institute of Science and Technology, Chennai. Furthermore, this fellowship has provided me excellent opportunity to establish an international collaboration for future research in the area of cardiovascular physiology and will be helpful in writing a joint collaborative project with the host laboratory (Kyoto University, Japan) in near future. I will transfer the acquired skills by provide hands on training to interested researchers/students.

A handwritten signature in black ink, appearing to be 'U. S. D.', written in a cursive style.

Signature of ICMR-IF

ICMR Sanction No. INDO/FRC/452/Y-5/2019-20-IHD