Elucidation of the role of leptin in the regulation of the hypothalamus- pituitary- adrenal axis in metabolic syndrome(2011-2014)

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Metabolic syndrome was induced in male rats and C57BL/6J mice by feeding high fat simple carbohydrate diet for a period of five months. The syndrome was ascertained by analyzing anthropometric and biochemical parameters. Dyslipidemia, impaired glucose tolerance was observed in the test animals. Male C57BL/6J mouse was found to be a better model for studying the syndrome. The catecholamines and serotonin pathways were studied in the brain and the catecholamines were studied in plasma Alterations in this metabolism were observed specifically in hypothalamus and plasma of the animal. *Invivo* higher levels of leptin and cortisol of test animals were observed as compared to control indicating hyperleptinemia and hypercortisolemia. *Invitro*leptin studies using adipose tissue explants revealed Norepinephrine mediated leptin secretion. As the concentration of Norepinephrine (NE)increases, it binds to low affinity *β*-adrenoreceptors and brings about decrease in leptin secretion and as the concentration of NE decreases, binds to α-adrenoreceptors, increases leptin release. Thus there is involvement of α-adrenoreceptors in leptin release and ours is the first study indicating this. Another important finding is that NE causes induction of leptin gene expression probably *via* activation of fos.

Research Publications: 2

1. D'Souza Serena Stephen and **Asha Abraham**A systematic study of biochemical profile during the induction and development of an animal model for Metabolic Syndrome .*Journal of Pharmacy and Biological Sciences (IOSR-JPBS)*,2014, 9 (1), Ver 4,109-113 e-ISSN 2278-3008; p-ISSN2319-7676, impact factor 1.138, Citation Index 71.7%
2. Serena D'Souza , Uma Maheshwari, SanthoshRebello and **Asha Abraham**.Identification of a PPAR delta agonist: An *in silico*approach towards drug design for Metabolic syndrome. **Prospects in Bioscience: Addressing the issues** Sabu A and Augustine A (eds) ISBN 978-81-322-0809-9, 2013, Springer publications

Poster paper presentations: 9

1. D'Souza Serena ,Uma Maheshwari, SanthoshRebello and **Asha Abraham.**· Molecular Docking: an in silico approach in the search of a candidate ligand for Peroxisome Proliferator Activated Receptor Gamma (PPAR γ) at UGC sponsored National conference on Biotechnological prospecting in herbal Anti-viral and Anti cancerous drug development organized by Dept of PG Studies & research in Biotechnology, Sri DharmasthalaManjunatheshwara College, Ujjere during 17th& 18th February 2012. – ORAL PRESENTATION. In the proceedings and abstracts of the conference BPHAVACDD-OP-IV-001 pg no. 30
2. Serena D'Souza , Uma Maheshwari, SanthoshRebello and**Asha Abraham.** Peroxisome Proliferator Activated Receptor Gamma (PPAR γ): a candidate for drug discovery? At

National seminar on Biomolecules & Biocatalysts on Bioprocesses, Organized by Dept. of Biochemistry St. Aloysius College on 8th& 9th March 2012. – ORAL PRESENTATION

3. Samantha Fernanades, AlifhaSeveres, TanushreeKudnekar, Serena D'Souza and **Asha Abraham**. Effect of High Fat Simple Carbohydrate (HFSC) Diet on Male Wistar Rats at National seminar on Biomolecules & Biocatalysts on Bioprocesses, Organized by Dept. of Biochemistry St. Aloysius College on 8th& 9th March 2012. - POSTER PRESENTATION
4. Serena D'Souza , Uma Maheshwari, SanthoshRebello and **AshaAbraham**.PPAR delta: a molecular target in Metabolic syndrome? International Conference on Advances in Biological Sciences is being organized by the Department of Biotechnology and Microbiology and Inter University Centre for Biosciences, Kannur University during March 15-17, 2012 at, Kannur, Kerala, INDIA- POSTER PRESENTATION
5. D'Souza Serena Stephen and **Asha Abraham**. Assessment of the central and peripheral catecholamine metabolism in Male C57BL/6J mice induced with Metabolic Syndrome- POSTER PAPER at International conference on Biology In Post Genomics Era and 82nd Annual Meeting of Society of Biological Chemists at Hyderabad Held At University Of Hyderabad, Hyderabad During 2 - 5 December 2013, page No 72in the abstract brochure
6. Swarnalatha B.N. and **Asha Abraham**. High fat simple carbohydrate fed C57BL/6J mice developed Glucose intolerance and Insulin resistance five months post feeding.**Oral presentation** at MARINA-13, 6th National Level Conference on "Biotechnology- Present and Future", organized by Dr. NGP Arts & Science college, Coimbatore, September 26th and 27th ,2013 page no 8, in the abstract brochure
7. SionaSilveira, SantyFernandes, Neena Roy, D'Souza Serena Stephen and **Asha Abraham**Histopathological Analysis of Kidney function in metabolic syndrome induced male C57BL/6J mice poster presentation at **Conference on "Science and Technology for Education and Health Care**" on 21st and 22nd February 2014 organized by JSS College Mysore in association with 'Karnataka Science and Technology Academy (KSTA). page 69-70
8. ViyannaMenezes, Deborah J Lewis,Neena Roy, D'Souza Serena Stephen and **Asha Abraham.** Study of Leptin secretion *in vitro* using adipose explants culture -poster presentation at **Conference on "Science and Technology for Education and Health Care**" on 21st and 22nd February 2014 organized by JSS College Mysore in association with 'Karnataka Science and Technology Academy (KSTA). page65
9. Deepthi K.V., Tisha Alex, Neena Roy, D'Souza Serena Stephen and **Asha Abraham** Effect of High Fat simple carbohydrate (HFSC) diet on the liver of C57BL/6J Mice poster presentation at **Conference on "Science and Technology for Education and Health Care**" on 21st and 22nd February 2014 organized by JSS College Mysore in association with 'Karnataka Science and Technology Academy (KSTA). page65-66