Archana Tiwari, J Cell Sci Ther 2012, 3:8
http://dx.doi.org/10.4172/2157-7013.S1.020

OMICS Group Conferences
Accelerating Scientific Discovery

2nd World Congress on
Cell Science & Stem Cell Research

November 12-14, 2012 Hilton San Antonio Airport, USA

Dynamic imaging of influx of Ca^{2+} in association with ascorbic acid using Wide Field and TIRF Microscopy with reference to repairing, reactivation and rejuvenation of insulin secreting diabetic MIN6 β-cell line

Archana Tiwari
Rajiv Gandhi Proudyogiki Vishwavidyalaya, India

Diabetes (Defective β-cell functioning or imbalance of glucose/insulin in body) has no treatment and number of people is died due to diabetes. Ca2+ is one of the most important elements in cellular signaling, controlling a diverse range of cellular processes. Present study focused on regulatory dynamics of calcium which may greatly facilitate diabetes research by using dynamic imaging of calcium in live cell i.e. MIN6 cell line for repairing, reactivation and rejuvenation in terms of cell viability and insulin secretion by using highly advanced imaging system i.e. WFM & TIRF Microscope in order to retrieve changes in the cellular events in diabetic condition and also monitor the effects of calcium on these all events.

The present investigation firstly advocates that ascorbic acid plays a very vital role in cell viability as addition of ascorbic acid alone as well as in combination with calcium induces greater cell viability in diabetic MIN6 cell line as compared to individual calcium. Secondly, the insulin secretion enhances in dose dependent manner with calcium while ascorbic acid shows adverse effects on the insulin release by MIN6 cells when its concentration exceeds 5mM of ascorbic acid alone as well as with calcium. At 15mM calcium and 10mM ascorbic acid cells have shown maximum viability and the combination of 10mM of calcium and 5mM ascorbic acid resulted in maximum increase in insulin level (0.405ng/ml). The impact of influx of calcium along with ascorbic acid can be beneficiary in terms of reactivation, repairing and rejuvenation of diabetic MIN6 cell line by enhancing the cell viability as well as insulin level in a dose dependent manner up to 5mM concentration of ascorbic acid. On the basis of the results obtained from the present investigation which clearly demarcates that calcium has impending capability to treat diabetes to develop the hypothesis of SOCE and CRAC channels. It also provides possible insight towards the persistent cure from diabetes mellitus This study strictly validates application of thapsigargin blocked calcium channels in MIN6 cell line confers the role of calcium in diabetes Type-2

Biography

Archana Tiwari after completion of her PhD, pursued her post doctoral studies form IISc Bangalore, India. She has been a First Class Rank holder throughout her academics and recipient of UGC post doc fellowship and several prestigious awards like Bharat Shiksha Ratna, Young Scientist award and Glory of India award. She has more than 60 publications in some of the referred journal of high repute. She is currently the Head of School of Biotechnology, Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal, India

anubiotech97@gmail.com