

## HUMAN GENETICS &amp; GENETIC DISEASES

## MOLECULAR MEDICINE &amp; DIAGNOSTICS

April 19-20, 2018 Dubai, UAE

**Targeting AMPK, mTOR and  $\beta$ Catenin by combined metformin and aspirin therapy in HCC: An appraisal in Egyptian HCC patients****Doaa Ali Abdelmonsif, Ahmed S Sultan, Wessam F EL-Hadidy and Dina Mohamed Abdallah**  
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Hepatocellular carcinoma (HCC) is an expanding health problem with a great impact on morbidity and mortality both in Egypt and worldwide. Recently, metformin and aspirin showed a potential anticancer effect on HCC although their mechanism(s) is not fully elucidated. To investigate the anti-proliferative effects of combined metformin/aspirin treatment against HCC, HepG2 cells were exposed to increasing concentrations of metformin, aspirin and combined treatment and MTT assay was performed. Caspase-3 activity, cell cycle analysis, protein expression of phosphorylated AMP-activated protein kinase (pAMPK) and mammalian target of rapamycin (mTOR) proteins were assessed. Furthermore, the expression and localization of  $\beta$ -catenin protein was assessed by immunocytochemistry (ICC). Finally, protein expression of pAMPK, mTOR and  $\beta$ -catenin was assayed in Egyptian HCC and cirrhotic tissue specimens. Results showed that metformin/aspirin combined treatment had a synergistic effect on cell cycle arrest and apoptosis induction via down-regulation of AMPK activation and mTOR protein expression. Additionally, metformin/aspirin combined treatment enhanced cell-cell membrane localization of  $\beta$ -catenin expression in HepG2 cells, which might inhibit metastatic potential of HepG2 cells. In Egyptian HCC specimens, pAMPK, mTOR and  $\beta$ -catenin proteins showed a significant expression compared to cirrhotic controls. In conclusion, combined metformin/aspirin treatment could be a promising therapeutic strategy for HCC and specifically Egyptian HCC patients.

**Biography**

Doaa Ali Abdelmonsif is an Assistant Professor of Medical Biochemistry, Faculty of Medicine, Alexandria University, Egypt. She also works as the Co-Manager of the Molecular Biology Laboratory, Centre of Excellence for Regenerative Medicine Research & Applications (CERRMA), Alexandria University and a Research Associate of the Nanomedicine Laboratory, CERRMA. She has completed her MD on pharmaco-genetic and epigenetic studies in breast cancer. Her research interest is in the fields of molecular biology, nanomedicine and cell therapy. She also serves as a Reviewer for many peer-reviewed specialized journals and a member of molecular biology, oncology and nanomedicine societies.

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