

3rd International Summit on **GMP, GCP & Quality Control** September 25-26, 2014 Valencia Convention Centre, Spain

Epigenetic stable reprogramming in early mammalian development for the disease free life

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Epigenetic modifications of the gene play a significant role in the elaboration of the genetic code as established at fertilisation. These modifications affect early growth and development through their influence on gene expression especially on imprinted genes. Gene-wide epigenetic reprogramming is essential in order to reset the specific marking of imprinted genes, but may have a more general role in the restoration of totipotency in the early embryo. DNA methylation is one of the best-studied epigenetic modifications of DNA in all unicellular and multicellular organisms. Preimplantation phase is characterised by its replication dependency (passive demethylation) and results as a consequence of the exclusion of DNA methyltransferase 1 (Dnmt1) from the nucleus. This enzyme is the primary maintenance DNA methyltransferase and normally restores DNA methylation to symmetrical dinucleotides in a semi-conservative manner during or shortly after DNA replication. Hence this type of genetic reprogramming will be used for any type of desired changes for the fourth coming life of that mammalian to obtain a totally disease free life.

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