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Lemonade Stand' funds stem cell research

December 28, 2012 | News | By BioSpectrum Bureau



Singapore: A team of scientists led by Stowers investigator, Dr Ali Shilatifard, has revealed that stem cells are always ready to activate highly diverse gene expression programs within a moment's notice so as to turn themselves into blood, brain, or kidney cells among others. The study was published in the December 27, 2012, online issue of Cell.

The research highlighted that stem cells stay plastic by stationing a protein called Ell3 (eleven-nineteen lysine-rich leukemia gene) at stretches of DNA known as 'enhancers', which are required to activate a neighboring gene. This suggests that Ell3 parked at the enhancer of a developmentally regulated gene, primes it for future expression.

Dr Zhuojuan Luo, a postdoctoral fellow in Dr Shilatifard's lab, also contributed to the study.Ã?Â Funding for the study came from the Stowers Institute for Medical Research, the National Institutes of Health (Shilatifard R01CA89455 and R01CA150265), and Alex's Lemonade Stand Foundation.

Dr Shilatifard revealed that, "We now know that some enhancer mis-regulation is involved in the pathogenesis of solid and hematological malignancies. But a problem in the field has been how to identify inactive or poised enhancer elements. Our discovery that Ell3 interacts with enhancers in ES cells gives us a hand-hold to identify and to study them."

"This work has opened up a whole new area of research in my lab. If we find that transcription factors bind to specific regions of chromatin in germ cells, I may focus on germ cells in the next few decades. This would open a huge door enabling us to determine the role of these factors in early development," added Dr Shilatifard.