A new method for creating safer induced pluripotent stem cells

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Journal cover image. Credit: Future Science Group

Induced pluripotent stem cells (IPSCs) hold great promise in regenerative medicine, personalized medicine and drug discovery. However, while avoiding the ethical controversies associated with embryonic stem cells, they carry neoplastic risk owing to the use of the oncogenes c-Myc and Lin28. This has limited their utility in the biomedical arena.

Work has previously demonstrated that IPSC generation can be uncoupled from c-Myc, but until now a viable oncogene- and virus-free

method has proven elusive.

A new research article from Alan B Moy and colleagues at Cellular Engineering Technologies (IA, USA) and The John Paul II Medical Research Institute (IA, USA) describes a promising new IPSC reprogramming approach that attempts to solve these issues. The open access article, "Efficient method to create integration-free, virus-free, Myc and Lin28-free human induced pluripotent stem cells from adherent cells", is available in *Future Science OA*.

Their approach saw adherent fibroblasts reprogrammed using a combination of reprogramming molecules and episomal vectors. The combinatorial approach was successful, yielding colonies in which 100% expressed SSEA4.

"Our reprogramming method provides patient- and disease-specific IPSC[s] for drug discovery and personalized medicine applications with lower risk of oncogenic perturbations due to Lin28 and Myc", noted the authors. "The reprogramming method paves a pathway for autologous and allogeneic cell therapy that satisfies regulatory requirements."

The team anticipates that virus- and oncogene-free IPSCs could advance cell therapies, diagnostics and personalized medicine. Furthermore, they envision the technology helping to reduce clinical trial failure rates and improve drug development.

More information: Anant Kamath et al, Efficient method to create integration-free, virus-free,and-free human induced pluripotent stem cells from adherent cells, *Future Science OA* (2017). DOI: 10.4155/fsoa-2017-0028