

# リプログラミング生物学 (梶 圭介) Biology of Reprogramming (KAJI Keisuke)



KAJI Keisuke, Ph.D.  
Professor  
Biology of Reprogramming  
MRC Centre for Regenerative Medicine  
The University of Edinburgh

E-mail address: [Keisuke.kaji@ed.ac.uk](mailto:Keisuke.kaji@ed.ac.uk)  
URL: <https://www.ed.ac.uk/regenerative-medicine/research/keisuke-kaji>

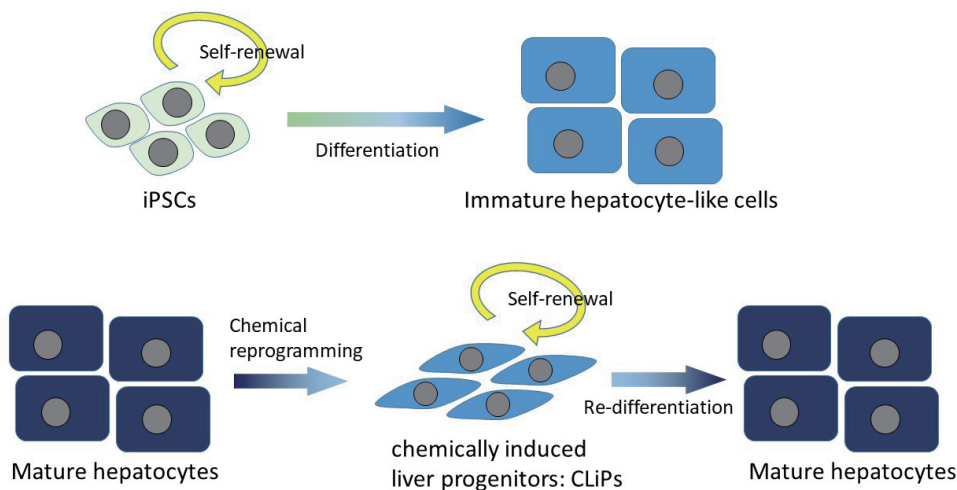


## 成熟肝細胞の前駆細胞へのリプログラミング

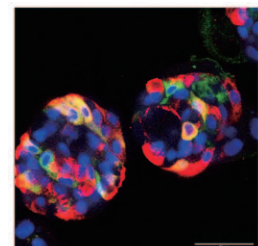
人工多能性幹細胞（iPS細胞）は様々な細胞に分化する能力を有していますが、肝細胞を含め多くの細胞種で大人の体にある成熟した細胞にまで分化させることが難しいのが現状です。最近、我々は成熟肝細胞を特殊な培養条件下に置き、増殖能と再分化能のある前駆細胞にリプログラミングすることに成功しました。このヒトchemically induced liver progenitors: CLiPsは今まで報告されている肝細胞株やiPS細胞由来の肝細胞様細胞よりも成熟した肝細胞へと分化できるため、薬物毒性試験、創薬研究、肝細胞移植など様々な用途で有用であることが期待されます。私たちの研究室ではさらにヒトCLiPsの詳細な解析、培養条件の最適化を進め、医療、創薬に役立つ細胞の作製を目指しています。

## Reprogramming mature hepatocytes into progenitors

While iPS cells have a great potential to give rise to any cell types in our body, it is the reality that many types generated from iPS cells are immature and not fully functional, including hepatocytes. We have recently succeeded in reprogramming human mature hepatocytes into progenitors that have unlimited proliferation and efficient re-differentiation capacities under a special culture condition. As these human chemically induced liver progenitors: CLiPs can re-differentiate into more mature hepatocytes than any other existing hepatocyte cell lines or iPSCs, we expect that they can become an extremely useful tool for toxicology tests, drug screen, hepatocyte transplantation therapy, etc. Our lab further aim to characterize these human CLiPs and optimize the culture condition and generates useful resource for medicine and drug discovery.



Hepatosphere with mature hepatocyte markers generated from hCLiPs  
ALB/CYP1A2/DAPI



iPS cells are extremely useful cells that have a potential to make any cell types like embryonic stem (ES) cells. However, in reality, many cell types generated from iPS cells/ESCs are immature and not fully functional, including hepatocytes. Chemically induced liver progenitors: CLiPs we have recently generated from mature human hepatocytes can keep proliferating over 3 months, and have an efficient re-differentiation capacity into mature hepatocytes.