



THE BUSINESS PARTNER
FOR YOUR IDEAS



NON-NUCLEATED CELLS FOR DRUG DELIVERY

THERAPEUTICS

Use of synthetic biology to stimulate production of non-nucleated platelets for drug delivery.

TECHNOLOGY TYPE

Drug Delivery
Stem Cells
Synthetic Biology

STAGE OF DEVELOPMENT

Proof of concept completed.

IP PROTECTION

Nationalized PCT Pending in the United States and Europe

Methods of Making Red Blood Cells and Platelets In Vitro and Uses Thereof

WO2017011550A1

Additional provisional patent and PCT filed.

FUNDING TO DATE

Tara Deans received the 2019 NIH Director's New Innovator Award for \$1.5M to support this technology.

LEARN MORE

Reference Numbers: U-5979, U-6681, U-6682

Aaron Duffy

Technology Manager
aaron.duffy@tvc.utah.edu
801-585-1377

TECHNOLOGY SUMMARY

Platelets are anucleated cells that play vital roles in clotting and maintaining internal body functions. Platelet disorders require time-consuming and resource-intensive transfusions. Donated platelets have a shelf-life of just five days and require HIV and blood-borne disease testing.

Synthetic biology has been used to create engineered megakaryocyte (MK) cells that differentiate into platelets *in vitro*. This creates a new source of platelets independent of donors to treat diseases associated with low platelet counts. This platform biotechnology/bioengineering technology has additional applications in systemic and targeted cell therapy. Of note, the MK cells are capable of being engineered to produce the non-nucleated platelets carrying therapeutic agents as well as to express specific receptors enabling targeted delivery.

FEATURES AND BENEFITS

- Stimulates the production of non-nucleated platelets with varying payloads and targeting moieties.
- Allogeneic source reduces the risk of foreign body response.
- Enables production of large volumes of purified platelets.

RECENT PUBLICATIONS

Deans, T. L., Grainger, D. W., & Fussenegger, M. (2016). Synthetic Biology: Innovative approaches for pharmaceuticals and drug delivery. *Advanced Drug Delivery Reviews*, 105, 1-2. doi:[10.1016/j.addr.2016.08.013](https://doi.org/10.1016/j.addr.2016.08.013)

INVENTOR PROFILE

Tara Deans, Ph.D., [Assistant Professor – Biomedical Engineering](#)

DATE UPDATED: 10/8/2019