



Lentivirus for keratinocyte immortalization and immortalized keratinocyte cell lines

A lentivirus for immortalizing human keratinocytes and immortalized keratinocyte cell lines.

IP Status: US Patent Pending

Applications

- In vitro human skin models
- Toxicity testing

Key Benefits & Differentiators

- **Unlimited keratinocyte supply:** Lentivirus allows for creation of an unlimited and consistent supply of keratinocytes
- **Keratinocyte stock creation:** Lentivirus allows for creation of keratinocyte stocks of any age, race, or sex
- **Decreased keratinocyte variability:** Lentivirus eliminates the variable and constantly changing sources of donor skin for toxicity testing>

Technology Overview

To better predict skin toxicity when directly exposed to cosmetics, chemicals, or pharmaceuticals, significant efforts are ongoing to develop in vitro human skin models. However, human keratinocytes (skin cells) used as the building block of in vitro human skin models are short-lived in culture and are not readily purchasable from commercial vendors. Also, keratinocytes from skin donors of a preferred age, race, or sex are difficult to obtain because skin donation is highly variable and inconsistent, as the source is left-over skin from surgeries. For these reasons, immortalized keratinocytes and new methods for keratinocyte immortalization are urgently needed to develop in vitro human skin models for toxicity testing.

Researchers at the University of Minnesota have engineered a new lentivirus that has demonstrated the ability to immortalize keratinocytes while retaining the ability to differentiate and form 3D skin epidermis. This lentivirus creates immortalized keratinocytes that would potentially be amenable to cosmetic, chemical, or pharmaceutical toxicity testing. The result is an unlimited and consistent supply of keratinocytes and the ability to create age, race, or sex-specific keratinocyte stocks. This technology would eliminate the variable and constantly changing skin sources and the extra time and cost required for extracting keratinocytes during surgery. Also, immortalized keratinocyte cell lines have been created using this lentivirus, including HEKa primary keratinocytes and keratinocyte cell lines from patients with rare genetic diseases including recessive dystrophic epidermolysis bullosa (RDEB) and xeroderma pigmentosum (XP).

Phase of Development

TRL: 4-5

Functional assays have been tested on the immortalized keratinocyte cell lines and demonstrated the

Technology ID

2020-286

Category

Engineering & Physical Sciences/Chemicals
Life Sciences/Biologics
Life Sciences/Biomaterials
Life Sciences/Biochemicals & Small Molecules
Life Sciences/Human Health
Life Sciences/Pharmaceuticals
Life Sciences/Research Tools
Life Sciences/Therapeutics

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ability to differentiate into 3D skin models.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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Researchers

- [Beth Thompson, PhD](#) Postdoc, College of Biological Sciences