Acoustic Concentrate Wash (ACW):
Gentle, flexible and modular cell processing

FloDesign Sonics Inc., 380 Main Street, Wilbraham, MA 01095

HOW IT WORKS

ECKKO™ PLATFORM FOR CLOSED, GMP-READY CELL PROCESSING

T-CELL CONCENTRATE-WASH

PROCESS FLOW DIAGRAM & PERFORMANCE – T-CELL CONCENTRATION AND WASH

Viability vs. Billion cells processed

- Initial cell concentration: 45,000 cells/mL
- Final cell concentration: 6,000 cells/mL
- Total cell volume processed: 1L
- Process time: 5 minutes

ACW does not affect primary T-cell phenotype

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

CONCLUSIONS:

ACW CAR-T cell processing:
- 90% average cell recovery
- 99% protein wash
- Input volume 1.2L
- Output volume 5-120mL
- Input VCD 1-40mL/mL
- Output VCD 100-500mL/mL
- No viability loss
- % T-cell unchanged
- CD8/CD4 ratio unchanged

Where to use:
- 200-fold volume reduction before electroporation or viral transduction
- Add or remove cryoprotectant
- Rapid medium exchanges during culture (replace filter-based perfusion)

Generic T-cell manufacturing PFD

ACW hPSC bioreactor media exchange:
- 97% hPSC aggregate retention
- 15-fold reduction in single cells
- No viability loss
- No morphology change in hPSC aggregates

Human pluripotent stem cell aggregate processes are often inefficient, leading to the generation of a population of single cells which may affect the growth and differentiation of hPSC aggregates. In contrast to traditional cell processing, the ACW can be used to enhance such single cells while retaining the cellular aggregates in the bioreactor.

Acoustic power curves: tunable aggregate/single cell ratio, same morphology

Human pluripotent stem cell aggregate processes are often inefficient, leading to the generation of a population of single cells which may affect the growth and differentiation of hPSC aggregates. In contrast to traditional cell processing, the ACW can be used to enhance such single cells while retaining the cellular aggregates in the bioreactor.

ACW CAR-T cell processing:
- 90% average cell recovery
- 99% protein wash
- Input volume 1.2L
- Output volume 5-120mL
- Input VCD 1-40mL/mL
- Output VCD 100-500mL/mL
- No viability loss
- % T-cell unchanged
- CD8/CD4 ratio unchanged

Where to use:
- 200-fold volume reduction before electroporation or viral transduction
- Add or remove cryoprotectant
- Rapid medium exchanges during culture (replace filter-based perfusion)

Generic T-cell manufacturing PFD

ACW hPSC bioreactor media exchange:
- 97% hPSC aggregate retention
- 15-fold reduction in single cells
- No viability loss
- No morphology change in hPSC aggregates

CONCLUSIONS:

ACW CAR-T cell processing:
- 90% average cell recovery
- 99% protein wash
- Input volume 1.2L
- Output volume 5-120mL
- Input VCD 1-40mL/mL
- Output VCD 100-500mL/mL
- No viability loss
- % T-cell unchanged
- CD8/CD4 ratio unchanged

Where to use:
- 200-fold volume reduction before electroporation or viral transduction
- Add or remove cryoprotectant
- Rapid medium exchanges during culture (replace filter-based perfusion)

Generic T-cell manufacturing PFD

ACW hPSC bioreactor media exchange:
- 97% hPSC aggregate retention
- 15-fold reduction in single cells
- No viability loss
- No morphology change in hPSC aggregates

CONCLUSIONS: