

Comparison between two types of water baths (wet and dry) in the context of the CAR-T cell reinjection circuit

COM24 -
70375



Bourgogne.O (1), Flandin.G (1), Cesbron.C (1), Grand.A (1), Spinau.C (1), Ruiz.C (1), Desquines.R (1), Canonge.JM (1) - (1) PUI Clinical Trial - MTI, IUCT Oncopole, CHU Toulouse



Introduction

CAR-T cells (*Chimeric Antigen Receptor*) :

- **Advanced Therapy Medicinal Products**
- **Indication:** AMM or AAP or clinical trial in certain malignant blood disorders

Specific process within Pharmacy Hospital :

- Reception of the patient's genetically modified T lymphocytes
- Storage at -180°C in nitrogen tanks
- Thawing at WB before reinjection into the patient



WWB

DWB

Increasing activity related to CAR-T cells use :

+ 148% increase between 2022 and 2023 in our center

→ Sought to optimize the thawing step of CAR-T cell bags using a water bath (WB)

→ The objective was to compare a currently used wet water bath (WWB) and a dry water bath (DWB)

Materials et methods

1

Identification and classification of various parameters related to WB using the manufacturers' technical data sheets, according to **9 characteristics** :

- Operating mode
- Dimensions
- Empty weight
- Filling and draining system
- Time to reach 37°C
- Sterile water consumption
- Cost
- Maintenance
- Safety system

→ **Creation of a comparative table**

2

Comparison of different usage times for the 2 WB :

FILLING

THAWING

DRAINING

1 fictitious bag of 68 mL provided by a CAR-T cell laboratory
→ thawed in WWB and DWB

6 test bags representing another laboratory conducted by closely replicating cell dispersion environment :

- 50 mL empty bag
- 23.75 mL of 0.9% NaCl,
- 1.25 mL or 5% of CryoStor CS10

→ 3 test bags thawed for each BM

Results

	Wet water bath	Dry water bath
Operating mode	Immersion of the bag in water at 37°C	Bag placed between 2 heating cushions (without direct contact with water)
Dimensions (LxlxH)	70 x 35 x 43 cm	34 x 60 x 32 cm
Empty weight	22 kg	18 kg
Filling and draining system	Manual	Automatic
Time to reach 37°C	14 min	13 min

	Wet water bath	Dry water bath
Sterile water consumption	3 plastic containers of 5 L sterile water per week on average. About 780 L per year	9 L of demineralized water once a year
Cost	3900 € HT	10190 € TTC
Maintenance	Disinfection product before and after each use. Annual maintenance	
Safety system	Presence of malfunction signals	

Comparative table of characteristics of WWB and DWB

Average times	Wet water bath	Dry water bath
Filling time	5 min	1,5 min
Thawing time		
• Fictitious bag	• 4 min	• 9 min
• Test bags	• 3,7 min	• 5,7 min
Draining time	13 min	1 min
Total usage time		
• Fictitious bag	• 22 min	• 11,5 min
• Test bags	• 21,7 min	• 8,2 min

Comparative table of usage times of the 2 WB

Conclusion / Discussion

Start-up and draining of the WWB are time-consuming and poorly suited to the ZAC, which does not have a water outlet

Advantages of DWB :

- + easy to use thanks to the automatic system
- + ecological by reducing plastic and water consumption
- Time-saving for the overall thawing step (*Filling, thawing, draining*)

Disadvantages of DWB :

- Longer thawing time
- ⚠ CAR-T cells have a short stability duration
- Cost is 2 to 3 times higher

Beneficial
Organizational Impact
for MTI Activity
**Decision to Reference
the DWB**