

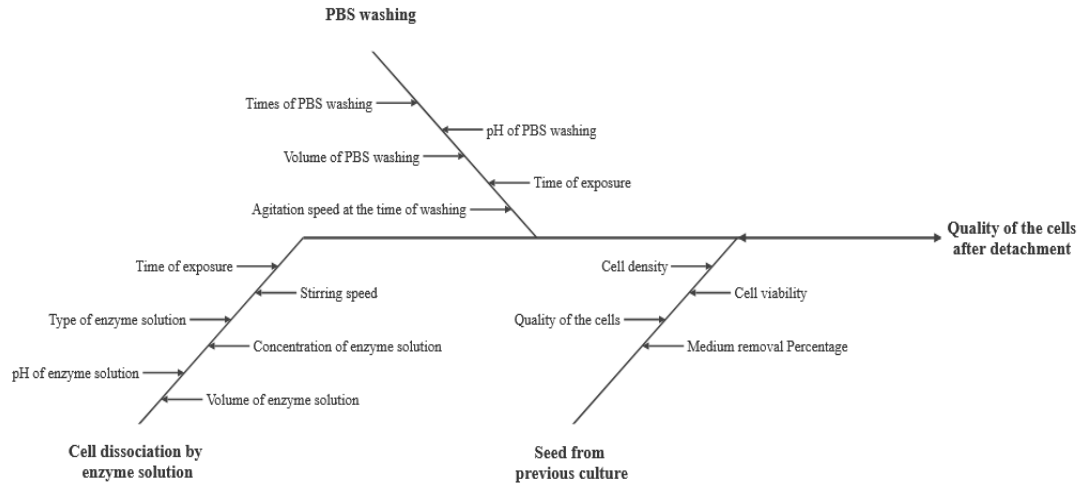
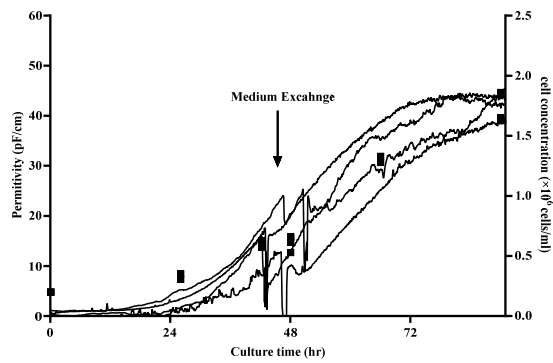


Figure S1. Fishbone diagram of the parameters involved in in-situ cell detachment

(a)



(b)

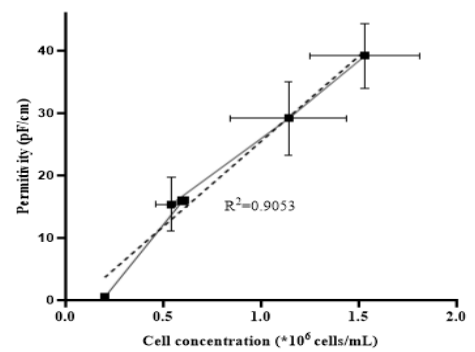
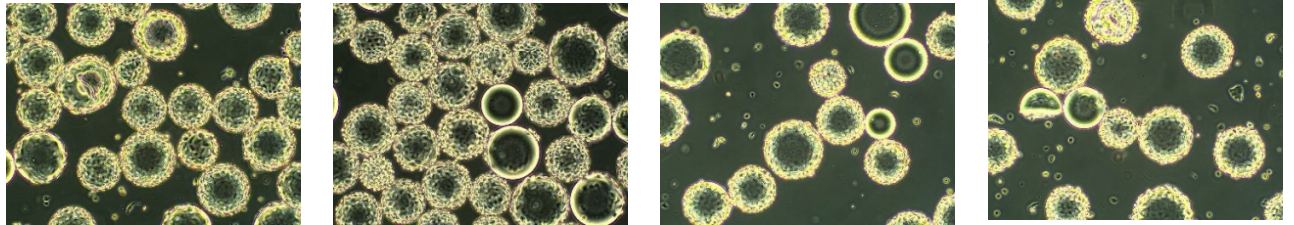


Figure S2. Kinetics of MA 104 cell cultures performed in condition explained in section 2.2: (a) off-line cell density measurements (■) and on-line permittivity (-), four independent experiments, (b) Linear correlation of Permittivity signal vs cell concentration in culture

(a) Final Trypsin concentration: 0.43 g/l



(b) Final Trypsin concentration: 0.86 g/l

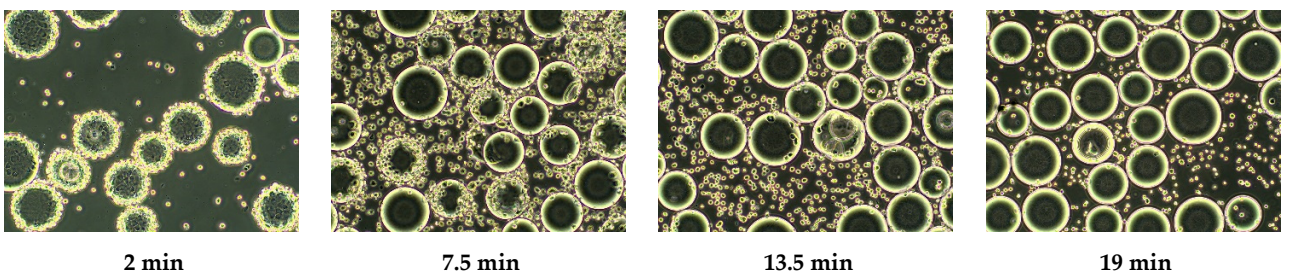


Figure S3. Visual observation of cell dissociation with an inverted microscope for cell dissociation with final enzyme concentration of 0.43 g/l (a) and 0.86 g/l (b) over in situ cell detachment course.

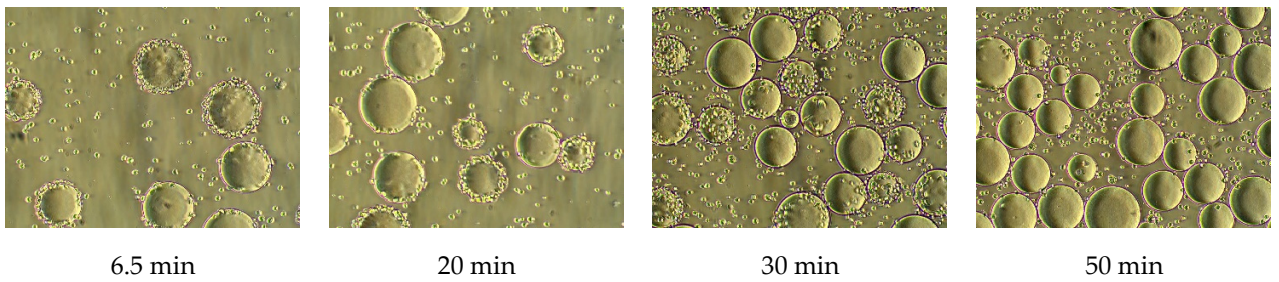


Figure S4. Visual observation of cell dissociation with an inverted microscope for cell dissociation with final enzyme concentration of 0.64 g/l

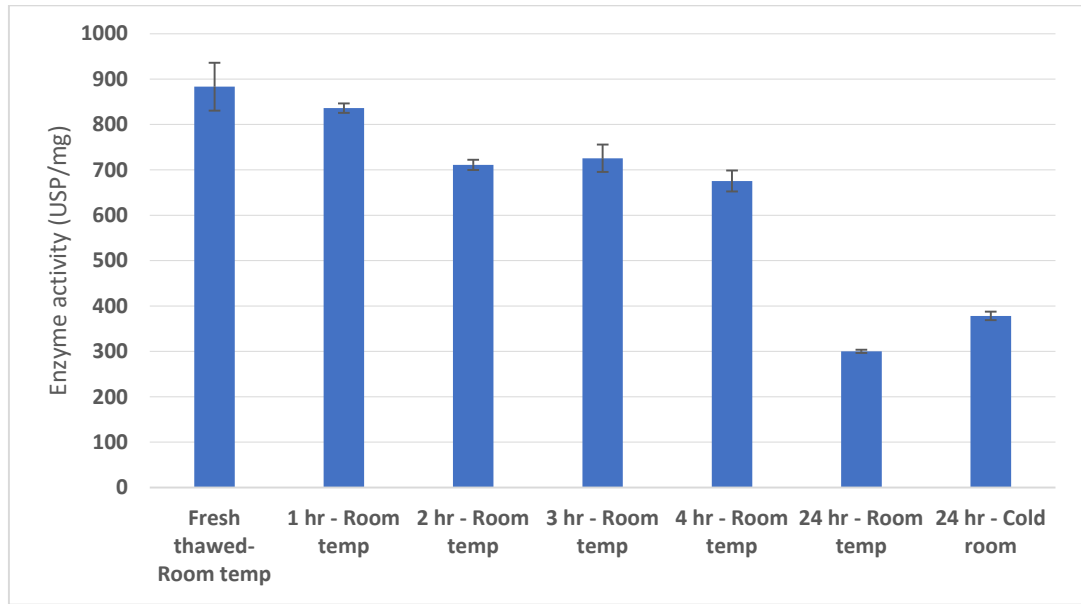
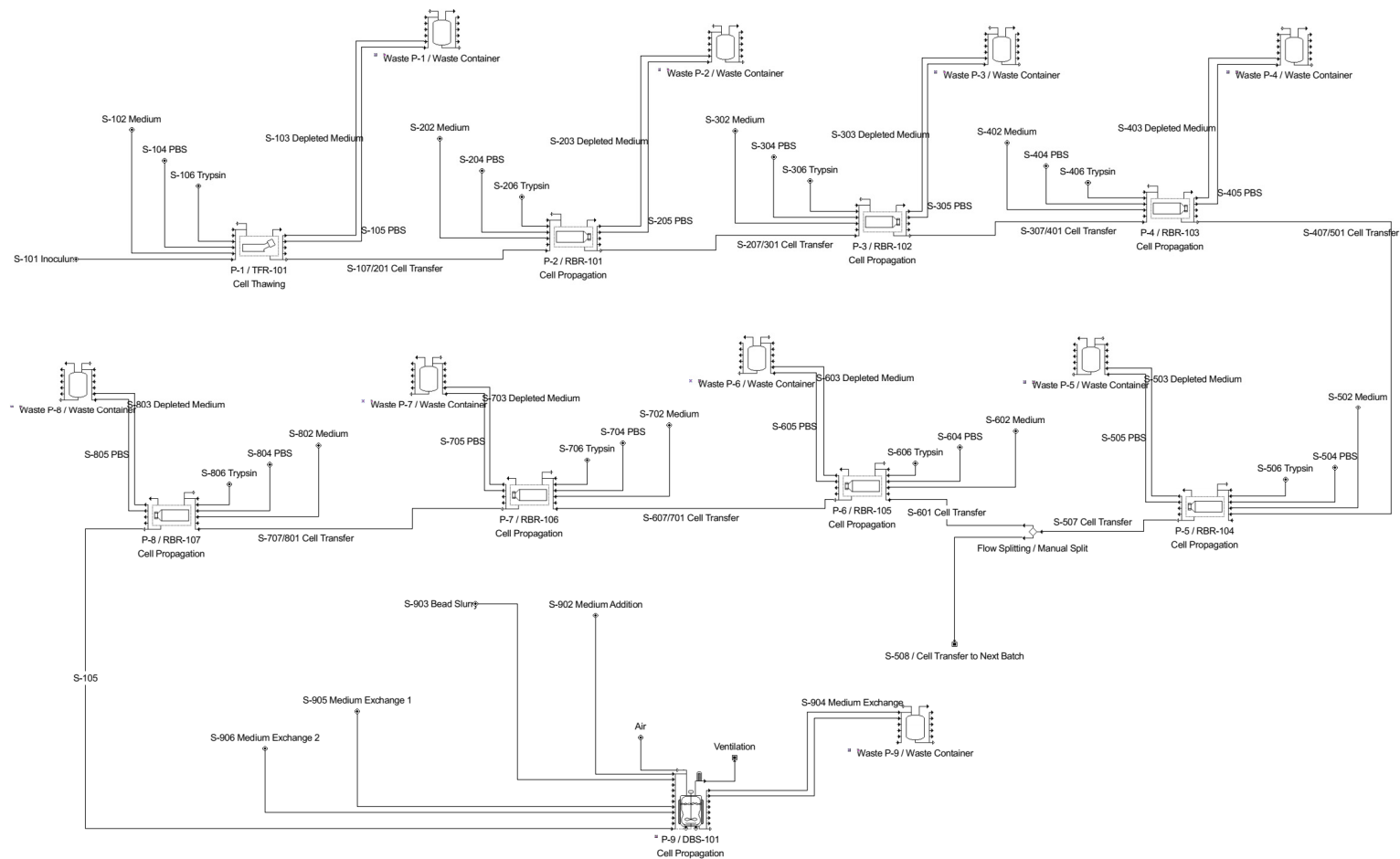


Figure S5. Trypsin-EDTA (0.25%) activity over different incubation times at room temperature and in a cold room (2-8 °C)

a)



b)

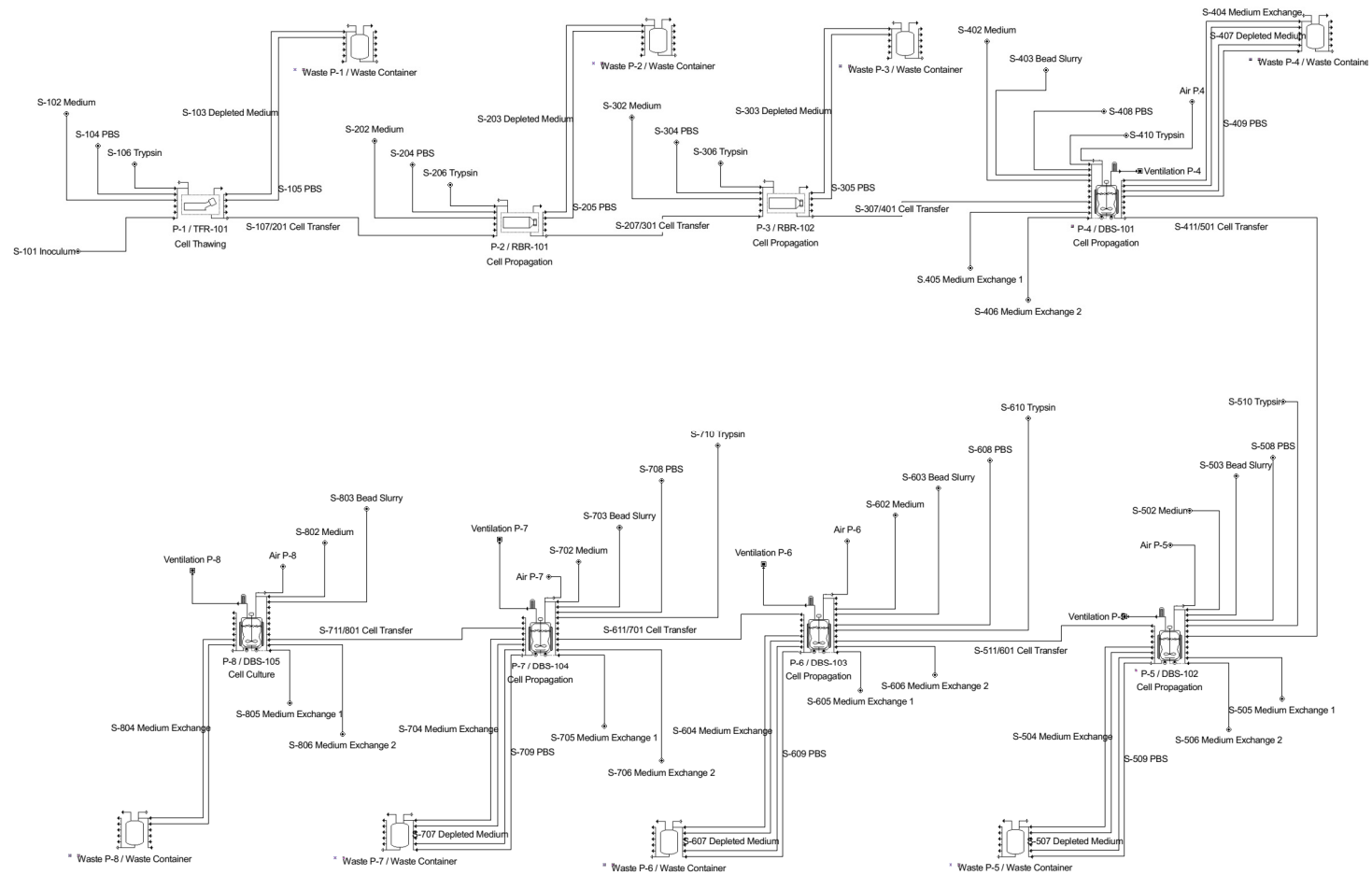


Figure S6. Schematic representation of the process flow for cell expansion and culture a) using roller bottles, followed by transfer to the final bioreactor for viral vaccine production. b) using single use bioreactor and cultivation on microcarrier

Table S1. Comparison of costs associated with static cell culture and microcarrier-based (MC-based) cell culture systems across different passages.

Passage number	Culture unit	Number of unit	Price of unit (€)
Static cell culture			
P.1	Flask 225 cm2	1	12
P.2	roller bottle (850 cm2)	1	10
P.3	roller bottle (1750 cm2)	3	25
P.4	roller bottle (1750 cm2)	10	25
P.5	roller bottle (1750 cm2)	30	25
P.6	roller bottle (1750 cm2)	105	25
P.7	roller bottle (1750 cm2)	368	25
P.8	roller bottle (1750 cm2)	1286	25
P.9	roller bottle (1750 cm2)	1	8000
Total cost (€)			53072
MC based cell culture			
P.1	Flask 225 cm2	1	12
P.2	roller bottle (850 cm2)	1	10
P.3	roller bottle (1750 cm2)	3	25
P.4	Bioreactor 3c	1	1400
P.5	Bioreactor 10c	1	1800
P.6	Bioreactor 50c	1	3500
P.7	Bioreactor 250 L (single use bag)	1	8000
P.8	Bioreactor 1000 L (single use bag)	1	8000
Total cost (€)			22797

Table S2. Comparison of resource consumption in microcarrier-based (MC-based) and static-based cell propagation.

	MC based cell propagation	Static based cell propagation
Glasgow medium (L)	1476	1800
FBS (L)	177.3	216
Trypsin-EDTA (0.25%)* (L)	46.1	59.5
Cytodex 1 (g)	3424,5	3420
*Trypsin consumption for MC based cell propagation is based on 50 mL/g _{MC} from Trypsin-EDTA (0.25%)		