

Table S1. Parameters for lyophilization cycle

Step	Temperature	Time (min)	Ramp Rate (°C/min)	Chamber Pressure (mT)
Loading	5°C	N/A	N/A*	N/A
Freezing	5°C to -50°C	110 min	0.5°C/min	N/A
	-50°C	120 min	N/A	N/A
	-50°C to -15°C	70 min	0.5°C/min	N/A
	-15°C	120 min	N/A	N/A
Primary Drying	-15°C	700 min	N/A	100 mT
Secondary Drying	-30°C to 25°C	80 min	0.5°C/min	100 mT
	25°C	120 min	N/A	100 mT

* Not applicable