Automated CAR T manufacturing using the Cellares Cell Shuttle Platform: Initial translational data from autoimmune subjects treated in RESET trials with rese-cel (Resecabtagene Autoleucel), an autologous 4-1BB CD19-CAR T cell therapy

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Key Takeaway

Translational data from the first two treated subjects suggest that rese-cel manufactured using the automated and closed Cell Shuttle platform are comparable to conventionally manufactured rese-cel in terms of pharmacokinetic and pharmacodynamic responses.

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Background

- Current autologous CD19-CAR T cell manufacturing is costly, complex, and difficult to scale. It relies on highly manual, technically demanding processes that introduce variability in product quality, prolong manufacturing timelines, complicate technology transfer and capacity expansion, and ultimately limit patient access.
- Automated, closed manufacturing platforms can overcome these challenges by improving reproducibility, scalability, and control while lowering cost. The Cellares Cell Shuttle™ platform enables low-cost autologous manufacturing with flexible, on-demand scaling—supporting production of many thousands of CAR T batches per year with minimal capital investment and near-instant technology transfer.
- Rese-cel (resecabtagene autoleucel, formerly CABA-201) is a fully human, autologous 4-1BB CD19-CAR T cell therapy being investigated in a variety of Phase I/II and registrational clinical trials for autoimmune diseases (AD).
- Here, we report on the initial translational data from the first two AD subjects dosed with infusion product produced with the Cellares Cell Shuttle platform. Subjects included one with Systemic Lupus Erythematosus (SLE, RESET-SLE™, NCT06121297) and one with systemic sclerosis with skin involvement (SSc, RESET-SSc™, NCT06328777) and compare these data with other AD subjects treated with conventionally manufactured product.

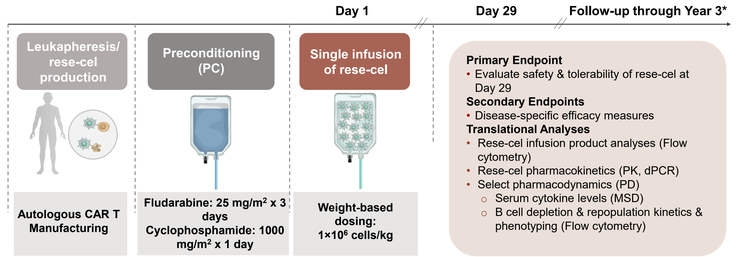

Figure 1. Study Design of Phase I/II RESET trials.

*Follow up period encompasses 15 years in total, aligned to regulatory guidance for CAR T cell therapies. Initial weight-based dose level.

Figure 2. Automated, closed manufacturing in the Cell Shuttle.

Methods

Rese-cel cell pharmacokinetic (PK) profiles were assessed by dPCR for transgene in PBMC samples. PK was reported as cells per µL of blood and was estimated by including the subject's white blood cell count per visit and the vector copy number for each subject's manufactured product using the following equation:

$$\frac{CAR\ T\ cells}{\mu L\ blood} = \frac{CAR\ copies}{\mu g\ DNA} * \frac{1\mu g\ DNA}{1e5\ cells} * \frac{PBMC}{\mu L\ blood} * \frac{1}{VCN}$$

where an estimation of 1 µg DNA per 1x10^5 cells was used[1] and the subject's PBMC count was determined using combined lymphocyte and monocyte counts[2]. Serum cytokines were measured via a multiplexed V-plex or U-plex mesoscale discovery (MSD) immunoassay. Flow cytometric analyses were performed on cell samples from apheresis, infusion product (IP), and post-infusion PBMC samples to assess CAR expression in CD3$^+$ T cells; CD4/CD8 and HLA-DR$^+$ expression in CAR$^+$ T cells. B cell numbers were also quantified using flow cytometry (via dual CD19 and CD20 expression) and evaluated to assess maturity (via CD24 and CD38). All flow cytometry was performed using custom multi-color antibody panels. Samples and controls were read on the Novocyte Quanteon flow cytometer (Agilent), and data were analyzed using FlowJo Software. Rese-cel cytotoxicity assays were performed *in vitro* using the IncuCyte® platform. Serum antibody panels were used to measure select lupus- and vaccine-associated antibodies in subject sera utilizing the Luminex FlexMap instrument. Serum antibody levels were reported as net median fluorescence intensity (MFI). The conventionally manufactured group (Conv) consisted of 38 rese-cel treated AD subjects that were evaluated across four distinct phase I/II, multi-center, open-label studies: RESET-SLE™, RESET-SSc™, RESET-Myositis® (NCT06154252), and RESET-MG™ (Myasthenia Gravis, NCT06359041).

[1] Baumer et al. 2018 Scientific Reports, [2] Boris et al. 2020 Molecular Therapy Methods & Clinical Development

Subjects Demographics

Table 1. Baseline demographics for subjects included in analyses.

	Rese-cel produced with automated Cell Shuttle (Auto)		Rese-cel produced by conventional manufacturing (Conv)
	SLE Subject	SSc Subject	38 AD Subjects* mean (SD)
Disease	SLE	SSc	SLE, SSc, Myositis, MG
Disease duration (yr)	14	4	6 (5)
Age (yr)	36	68	48.8 (14.6)
Sex	F	F	F=24 M=14

*Data cut as of 30 Oct 2025. Data cut for data from Cell Shuttle subjects as of 06 May 2026.

Pharmacokinetics of rese-cel

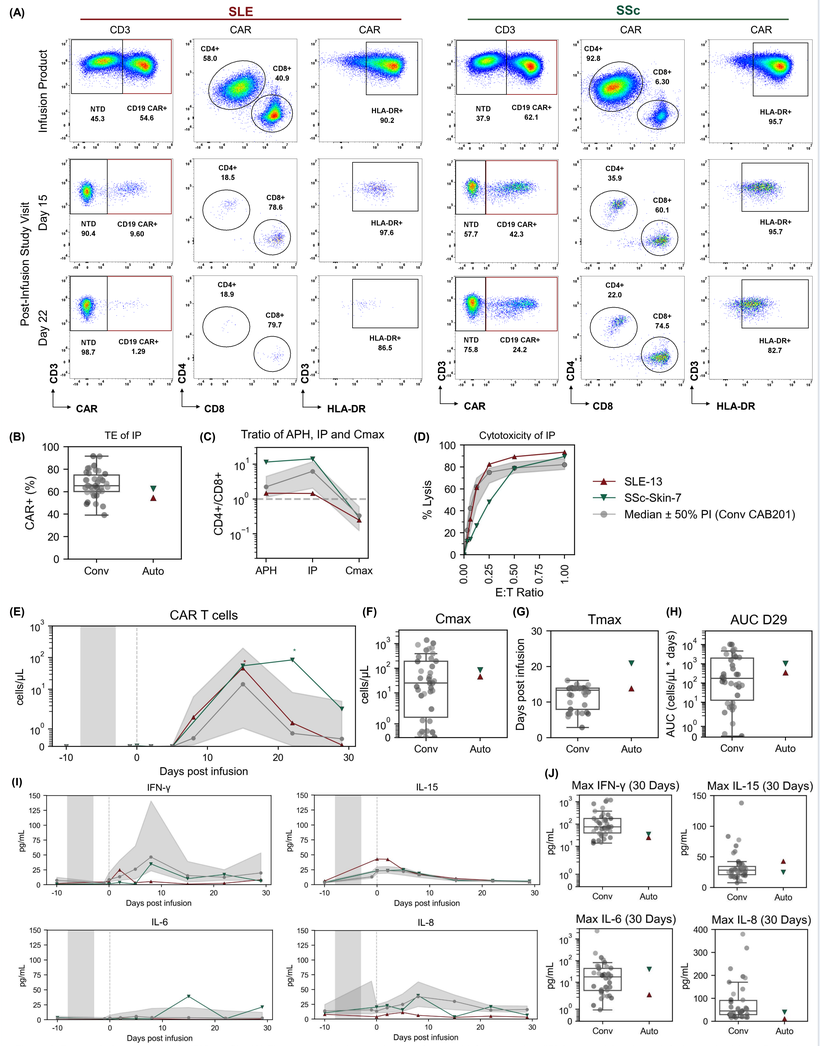

Figure 3. Rese-cel pharmacokinetic (PK) profile. (A) Flow cytometric characterization of rese-cel infusion product (IP) (top panels) and post-infusion study visits at Day 15 (middle panels) and Day 22 (bottom panel). Left plots for each subject depict CD19 CAR$^+$ and non-transduced (NTD) T cells as a percentage of total CD3$^+$ T cells. Middle and right plots are of percentage of CD19 CAR$^+$ T cells. Middle plots for each subject depict CD4$^+$ and CD8$^+$ T cells. Right plots for both subjects depict HLA-DR expression. **(B)** CD19 CAR+ (TE) as a percentage of total CD3$^+$ in IP. Boxplots represent median, 50th percentile interval, and range. Conventionally manufactured subjects shown in gray (Conv) and Cellares automated subjects shown in color (Auto). **(C)** Ratio of CD4$^+$ to CD8$^+$ cells in apheresis (APH), CD4$^+$ to CD8$^+$ CAR T cells in IP, and CD4$^+$ to CD8$^+$ CAR T cells at C_{max}. Line plots depict the median and 50th percentile intervals of values from subjects treated with conventionally manufactured rese-cel, shown in gray. **(D)** In vitro lysis of GFP$^+$CD19$^+$ NALM6 target cells by CD19 CAR T cells from subjects' IP. Area under the curve (AUC) generated by graphing the number of target cells for each effector to target (E:T) ratio (ranging from 0:1 to 1:1) over time (5 days). Percent lysis determined by the difference between each $AUC_{E:T}$ and $AUC_{0:1}$ divided by the $AUC_{0:1}$ then multiplied by 100. **(E)** Pharmacokinetic response of rese-cel represented as number of CAR T cells/µL blood from baseline through 29 days post-infusion as measured by dPCR. Data points with asterisks had low DNA input per assay recommendation. SSc-Skin-7 Day 8 timepoint not plotted due to missing CBC data.**(F)** Maximum CAR T cell concentration in blood (C_{max}). **(G)** Time (days post-infusion) to maximum concentration (T_{max}). **(H)** AUC for CAR T concentration curve over the first month following infusion. **(I)** Serum concentration of IFN-γ, IL-15, IL-6, and IL-8 at baseline and over the first month following infusion. **(J)** Peak serum concentrations of IFN-γ, IL-15, IL-6, and IL-8 in the first month after rese-cel infusion.

Pharmacodynamics of rese-cel

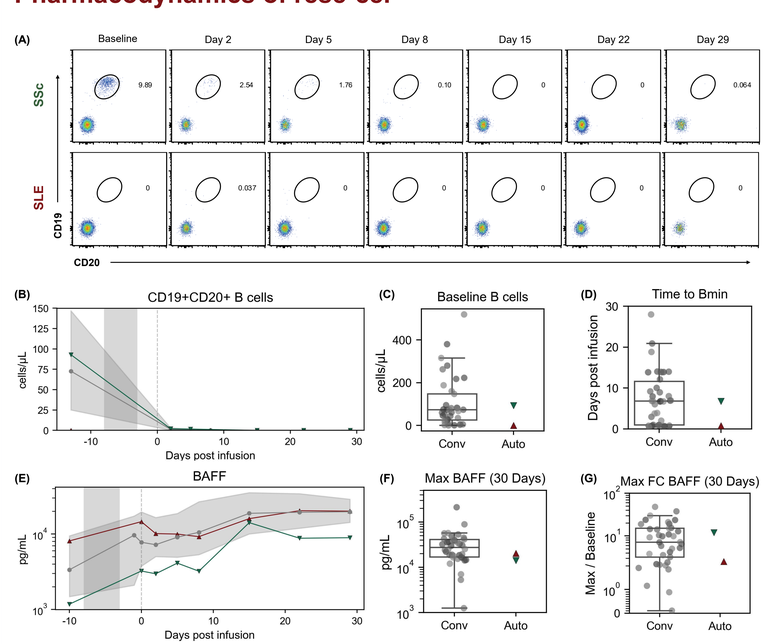

Figure 4. Rese-cel B cell kinetics. (A) CD19$^+$CD20$^+$ peripheral B cells measured by flow cytometry form baseline through post-infusion day 29. **(B)** Peripheral B cells counts measured by flow cytometry and represented as number of CD19$^+$CD20$^+$ cells/µL blood. Median and 50th percentile intervals of values from subjects manufactured with conventional manufacturing (conv) shown in gray. **(C)** Baseline B cells represented as number of CD19$^+$CD20$^+$ cells/µL blood for Cellares subjects compared to reference subjects shown in gray (conv). **(D)** Time to minim B cell counts for Cellares subjects compared to reference subjects shown in gray (conv). **(E)** Longitudinal serum B cell activating factor (BAFF) levels. Median and 50th percentile intervals of values from subjects shown in gray (conv). **(F)** Peak serum BAFF levels and **(G)** peak fold-change from baseline for Cellares subjects compared to reference subjects shown in gray (conv). Boxplots depict the median, 50th percentile interval, and range.

Summary

- We report initial translational data from the first 2 subjects treated with a cell therapy product manufactured using an automated and closed process in the Cell Shuttle.
- Rese-cel infusion products manufactured by the automated Cell Shuttle are comparable to conventionally manufactured rese-cel. CAR+ percentage, CD4/CD8 ratio, and cytotoxicity measurements from both Cell Shuttle manufactured products fall within the range observed for conventionally manufactured rese-cel in AD subjects.
- C_{max} of both Cell Shuttle–treated subjects were within the IQR observed among subjects treated with conventionally manufactured rese-cel. At C_{max}, circulating CAR T cells were CD8$^+$ dominant. The shift from CD4 to CD8 CAR T cells at C_{max} is consistent in subjects dosed with conventionally produced IP. The time of C_{max} for the SSc subject differs between flow and dpcr. This combined with the close values at 15 and 21 days post-infusion may suggest that the true C_{max} was missed.
- Post-infusion serum IFN-γ, IL-6, and IL-15 peak concentrations in both Cell Shuttle–treated subjects were within the range observed among subjects treated with conventionally manufactured rese-cel. Peak post-infusion serum IL-8 was within the range observed for subjects treated with conventionally manufactured rese-cel or lower.
- Circulating B cells were depleted by day 8 following rese-cel infusion in the SSc subject treated with Cell Shuttle–manufactured rese-cel, which is near the median value observed in subjects treated with conventionally manufactured rese-cel. The SLE subject treated with Cell Shuttle–manufactured rese-cel did not have detectable B cells at baseline.
- Maximum BAFF (in concentration and fold-change) following infusion of Cell Shuttle–manufactured rese-cel were within the range observed in subjects treated with conventional rese-cel, suggesting similar depth of systemic B cell depletion in these first two subjects.
- These results suggest that rese-cel products manufactured using the Cellares Cell Shuttle™ exhibit comparable in vivo behavior to rese-cel products manufactured using conventional processes. By enhancing reproducibility, scalability, and process control while reducing cost, the Cell Shuttle™ platform enables low-cost autologous manufacturing with flexible, on-demand scaling—eventually supporting production of many thousands of CAR-T batches per year with minimal capital investment and near-instant technology transfer which requires 90% fewer technicians and 90% less space than standard autologous cell therapy manufacturing approaches

Data Cut for subjects infused with rese-cel manufactured using the automated Cell Shuttle: 06 May 2026; Data Cut for subjects infused with rese-cel manufactured using conventional process: 30 Oct 2025.

Abbreviations: AD, autoimmune disease; Aph, apheresis; AUC, area under the curve; auto, automated manufacturing; BAFF, B cell activating factor; CAR, chimeric antigen receptor; conv, conventional manufacturing; Cmax, maximum concentration; conv, conventional manufacturing; CY, cyclophosphamide; FLU, fludarabine; IIM, Idiopathic Inflammatory Myopathies; IM, immunomodulatory; IP, infusion product; IQR, interquartile range; IV, intravenous; IVIg, intravenous immunoglobulin; LD, Lymphodepleting preconditioning; mAb, monoclonal antibody; MG, Myasthenia Gravis; N/A, not applicable; NTD, Non-transduced; PD, pharmacodynamic; PK, pharmacokinetic; RESET, REstoring SElf-Tolerance; rese-cel, resecabtagene autoleucel; SLE, Systemic Lupus Erythematosus; SSc, Systemic sclerosis; TE, transduction efficiency; TOC, tocilizumab;

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