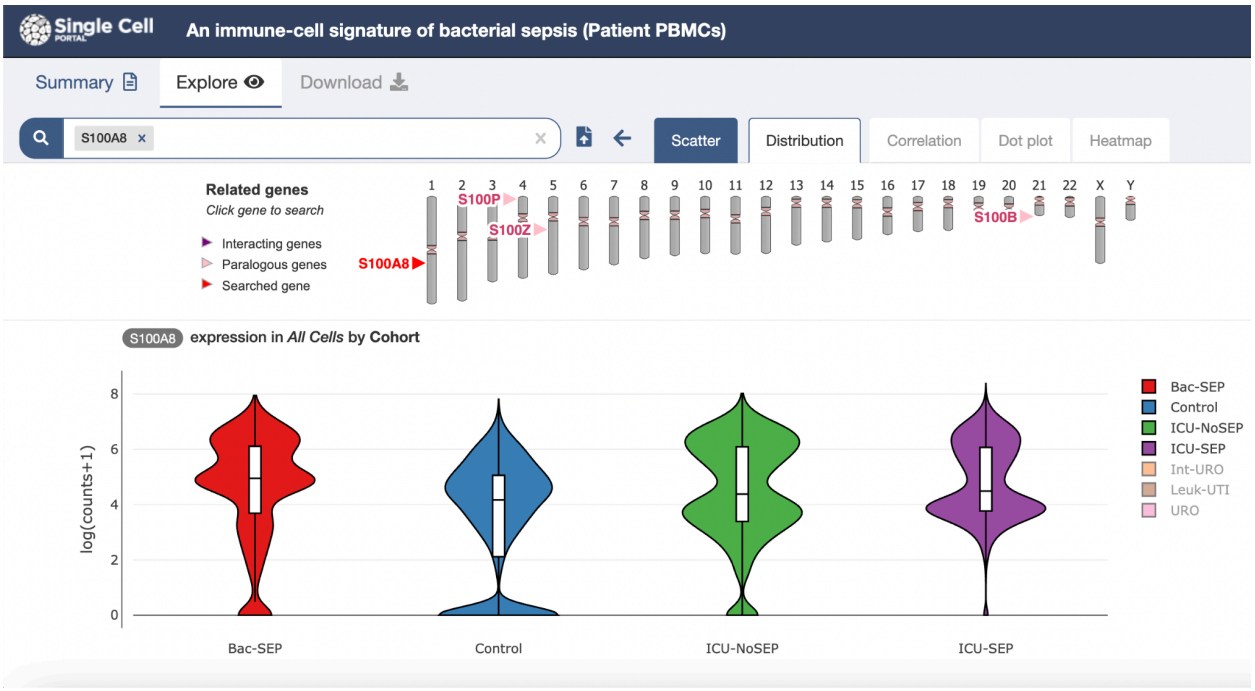
scRNA-seq_S100A8:

This violin plot visualizes S100A8 expression in all cells (likely PBMCs) stratified by patient cohort:



Cohort	Observation from Plot	Interpretation
Bac-SEP (🔴)	Very wide and tall violin, median ~6.5, peak density between 5–7.	Strongly upregulated in bacterial sepsis → intense innate immune activation.
ICU-SEP (🟣)	Wide violin, median ~6, distribution broader than control.	Elevated expression consistent with inflammatory sepsis response.
ICU-NoSEP (🟢)	Noticeably high violin plot, median ~5.5, broader than control.	Moderate to high expression, indicating low-grade inflammation in critically ill but non-septic patients.
Control (🔵)	Narrower, lower violin, median ~4.5.	Baseline expression — expected in healthy individuals without inflammation.

S100A8 (also known as MRP8) is a calcium-binding protein in the S100 family. It is highly expressed in:

- Neutrophils

- Monocytes
- Often pairs with S100A9 to form the heterodimer calprotectin.

Biological Role:

- Acts as a pro-inflammatory alarmin (DAMP).
- Recruits immune cells during infection and tissue damage.
- Strongly upregulated in sepsis, autoimmune disorders, and acute inflammation.
- Activates receptors like TLR4 and RAGE.

The expression pattern of S100A8 across cohorts highlights its function as a potent inflammatory marker. Expression is markedly elevated in bacterial sepsis, confirming its role in innate immune activation. Interestingly, ICU-related groups, including non-septic patients, also show moderate-to-high expression, suggesting that critical illness alone can stimulate S100A8. These trends support S100A8 as a **potential biomarker of inflammation and disease severity across septic and non-septic critical illness**.