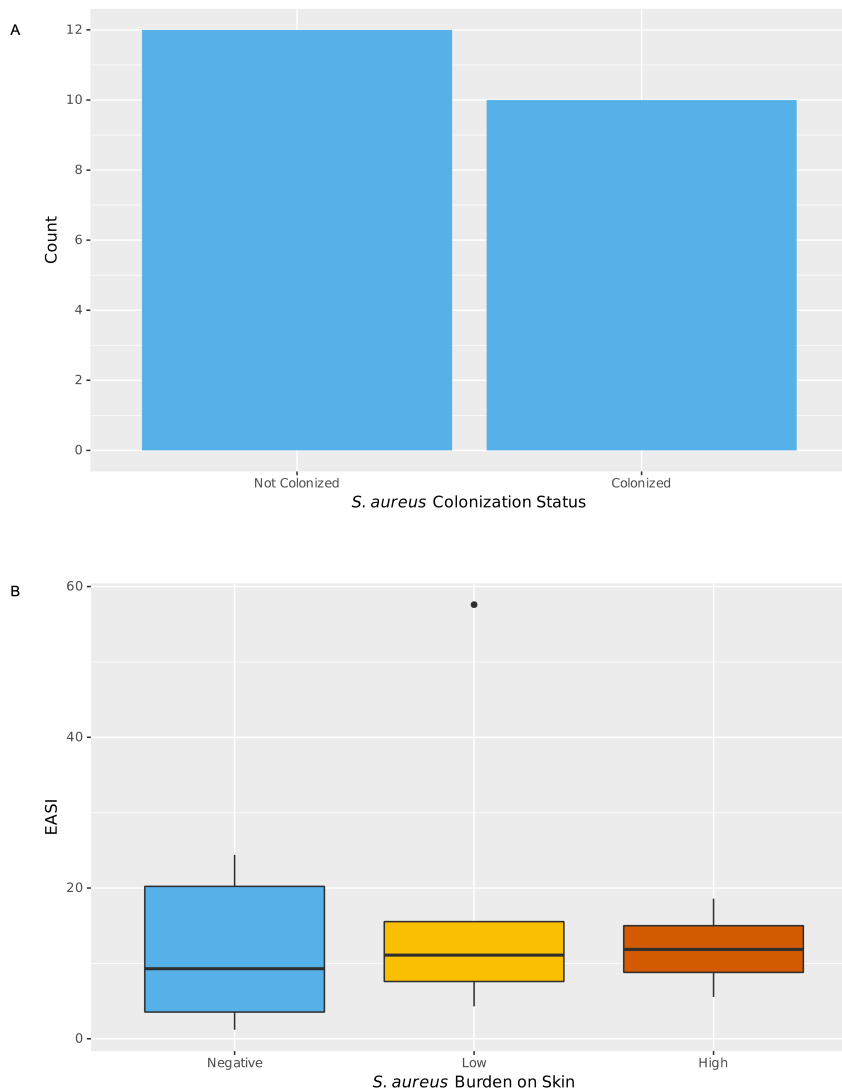


Supplemental Figure 1:

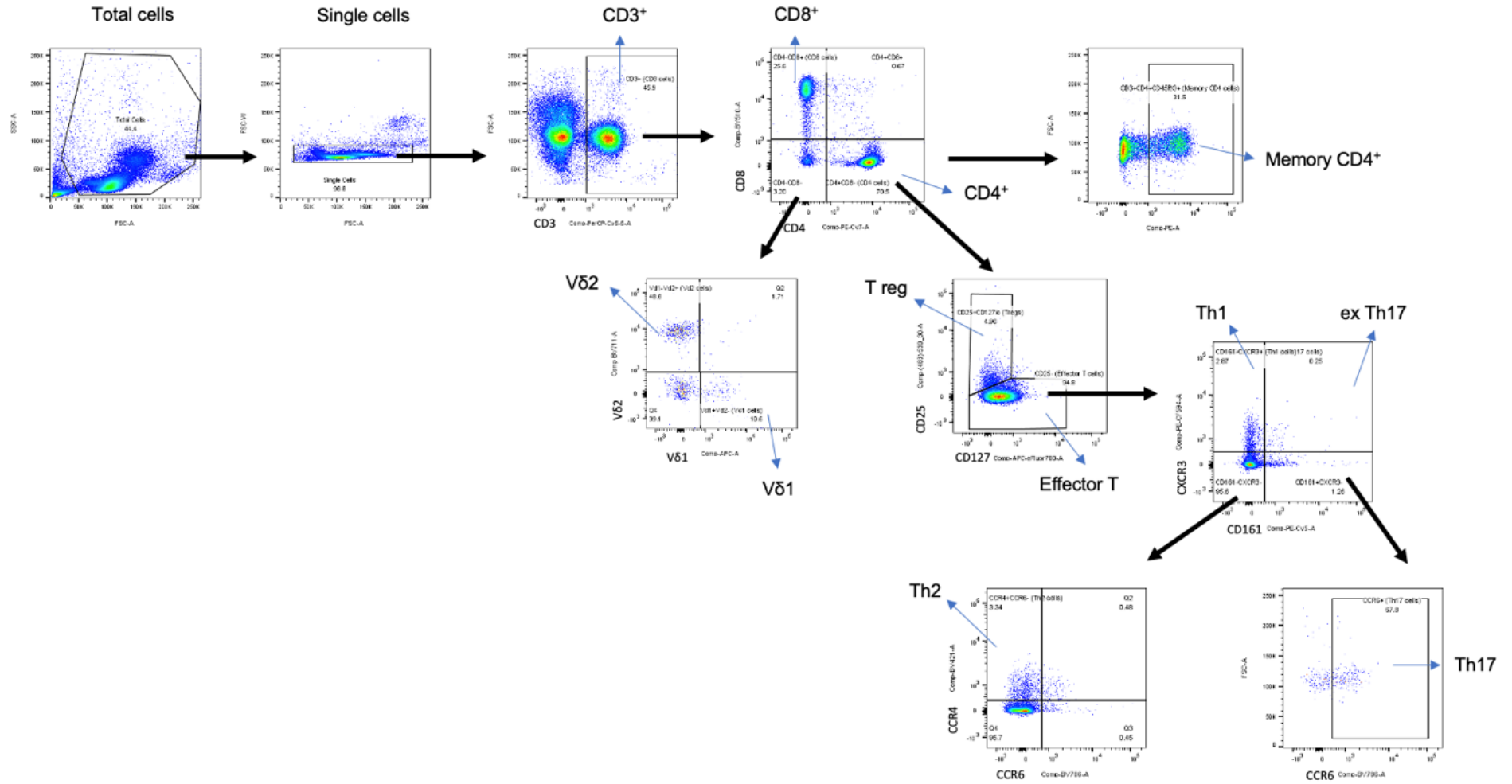


***S. aureus* colonization status of AD patients on systemic immunomodulatory treatment and burden of *S. aureus* skin colonization in *AD_{control}* patients on systemic immunomodulatory therapy**

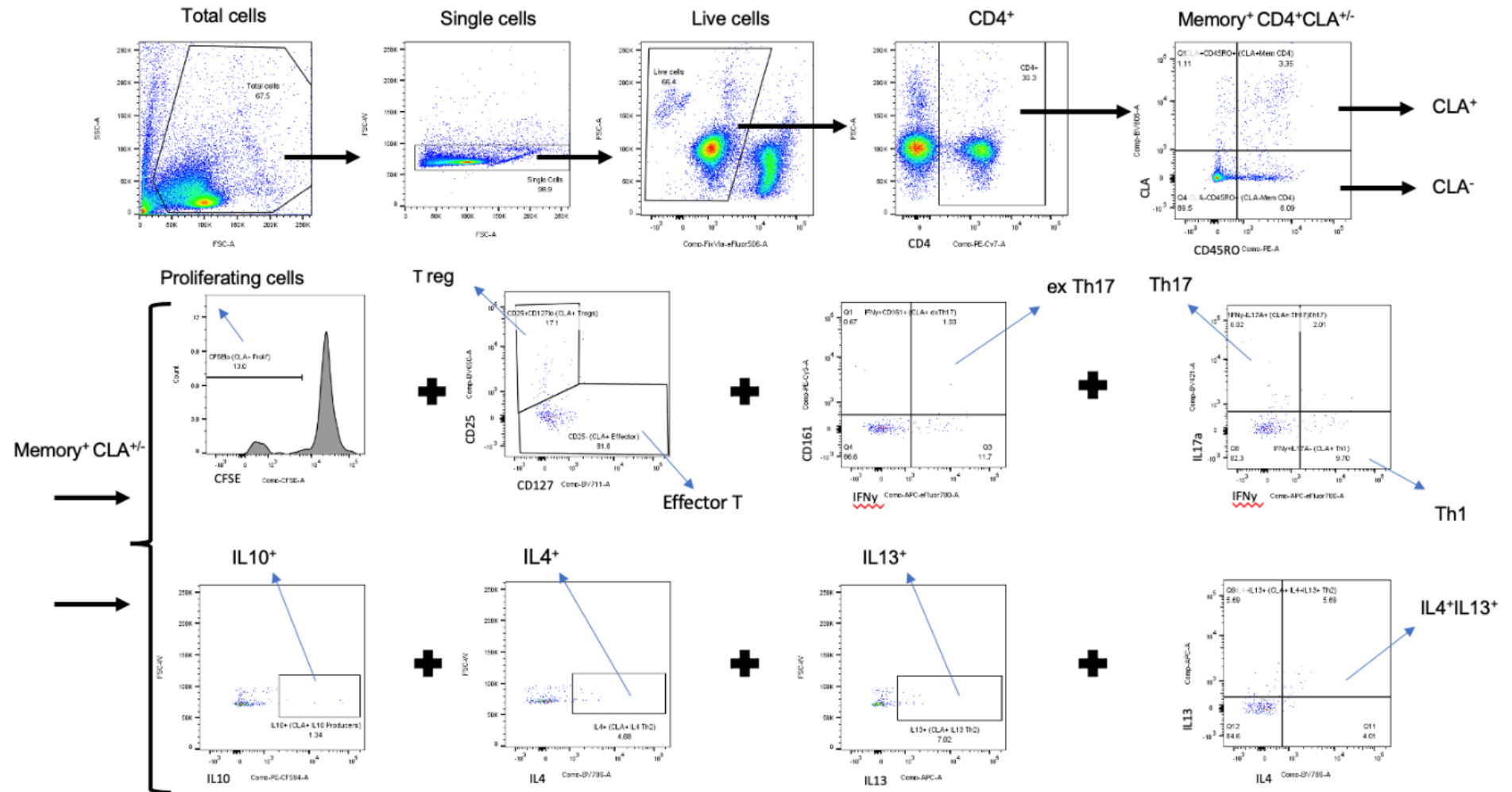
Subjects on systemic immunomodulatory treatment for management of AD ($n = 22$) in the total study cohort were grouped according to *S. aureus* skin colonization status (A). The number of patients is indicated on the x-axis and colonization status is shown on the y-axis. There was no significant correlation between colonization status systemic immunomodulatory treatment as assessed using the chi-squared test. (p value = 0.08). Colonized and on systemic immunomodulation: $n = 10$. Not colonized and on systemic immunomodulation: $n = 12$

Subjects on systemic immunomodulatory therapy within the *AD_{control}* cohort ($n = 21$) were grouped according to their burden of *S. aureus* skin colonization: negative ($n=12$), low ($n=5$) and high ($n=4$), to determine if those with high colonization represented therapeutic non-responders (B). The burden of *S. aureus* colonization is indicated on the x-axis and EASI score is indicated on the y-axis. There was no correlation between EASI score and the burden of *S. aureus* skin colonization using the t-test of Spearman correlation in *AD_{control}* subjects on systemic immunomodulatory therapy (p value = 0.63).

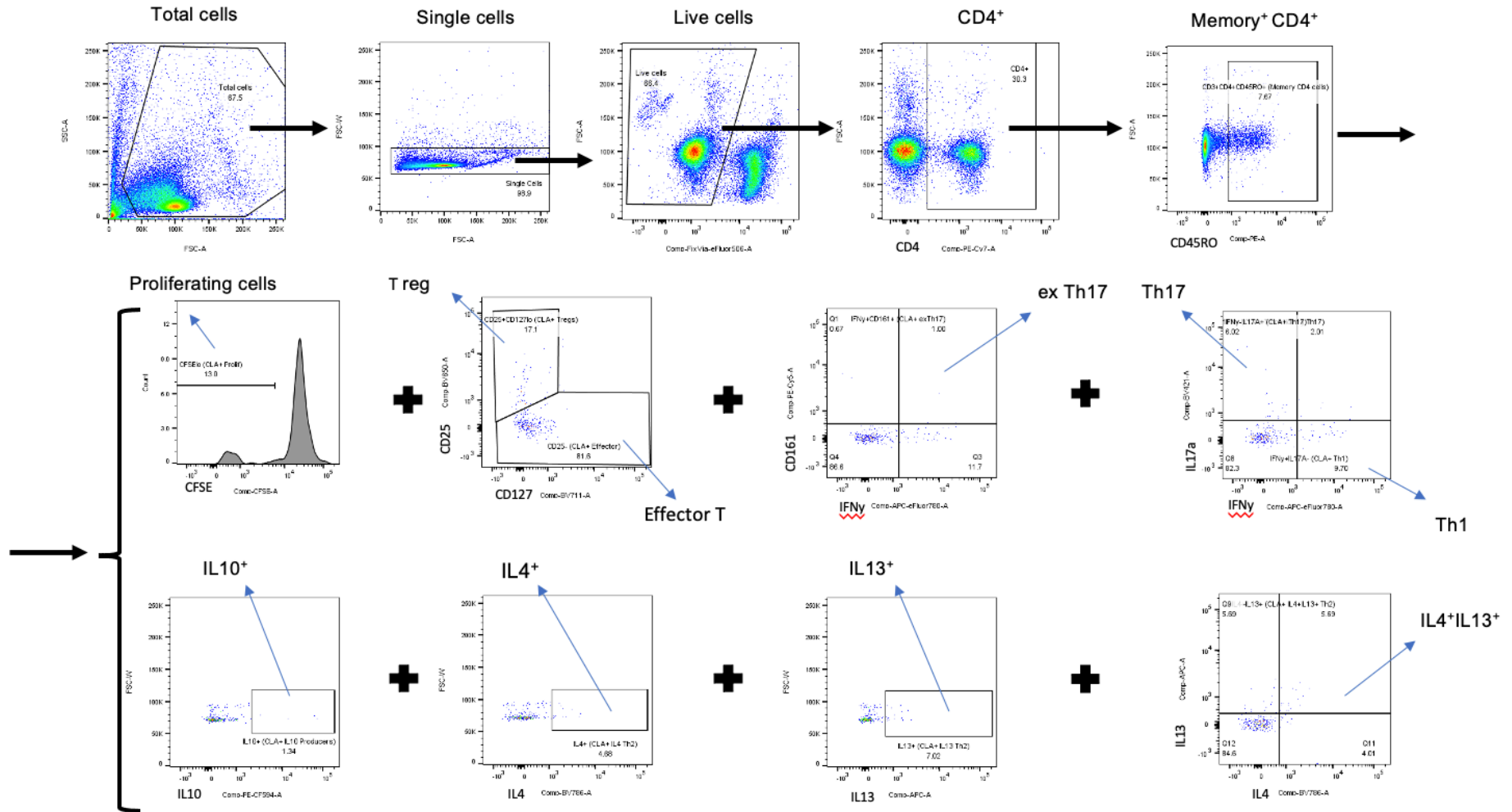
Supplemental Figure 2: Gating for circulating T cell populations



Supplemental Figure 3: Gating for CLA[±] *S. aureus* antigen-specific memory responses



Supplemental Figure 4: Gating for total *S. aureus* antigen-specific memory responses



Supplemental Data 5: MIATA / MIANKA Checklist

#	Required	If available	Optional	MIANKA & MIATA Sub-Modules
Module 1 - Sample				
Module 1A - Donor				
1.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Essential donor info
Module 1B Source				
1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Source of cell material
1.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Collection methodology
1.4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	anti-coagulant, if available
1.5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Transportation/storage conditions for unprocessed samples, if available
1.6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cell processing methodology
1.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Median time and ranges from sample collection until end of cell processing, if available
1.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cut-offs, if used
Module 1C - Cryopreservation and Storage				
1.9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fresh or cryopreserved
1.10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If cryopreserved devices used
1.11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	freezing process
1.12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	medium used for freezing
1.13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Median time and temperature for each transportation and storage step, if available
1.14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cut-offs, if used
Module 1D - Cell Counting				
1.15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Median cell yield and viability (where available)
1.16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	before freezing
1.17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	after thawing
1.18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	after overnight resting
1.19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cut-offs, if used
1.20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cell counting methodology
1.21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Additional assessments

Module 2 - Assay				
Module 2A - Medium/serum				
2.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Medium/(serum) details
2.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pretesting info
Module 2B - Assay				
2.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Treatment procedures of cells prior to assay, if applicable
2.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sufficient assay details
Module 2C - Controls				
2.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Internal assay controls
2.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Acceptance criteria, if available
2.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	External reference samples, if used
2.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Assay acceptance criteria, if available
Module 3 - Data Acquisition				
Module 3A - Equipment and software				
3.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Equipment and software version
3.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Basic equipment settings, if available
Module 3B - Acquisition Strategy and Gating				
3.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Detailed gating strategy or strategy for establishing spot detection parameters
3.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Representative data set
3.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Mean, median, ranges of event counts for relevant populations, if available
3.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Unusual strategies explained
3.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Review of raw data
Module 4 - Results				
Module 4A - Raw data				
4.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Background and ag-specific reactivity levels, if available
4.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cut-off specifications and # of tests OOS, if available
4.3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Accessibility of raw data addressed?
Module 4B - Response determination				
4.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Definition of positive reactivity (above background) including tests applied
4.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Parameters, software and version used for response determination, if applicable
4.6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Response definition predefined or post-hoc?
4.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Definition of response induced by treatment, if applicable
4.8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Any data excluded and why, if applicable?
4.9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Why test was used
Module 5				
Module 5A - General Lab Operation				
5.1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Guidance of lab operations
5.2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Laboratory accreditations and certifications, if available
5.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Details on audits
Module 5B - Standardization				
5.4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Status of protocols
Module 5C - Qualification/Validation				
5.5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Status of assays
5.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Optional: Specific performance criteria

Supplemental Data 6: Link to statistical coding

https://github.com/DanDempsey/AD_Study_Code