# Immunophenotyping IMPC_IMM_002

## Purpose

This test differentiates immune cell sub-populations via flow cytometry.

Description: increased CD4-positive T cell number (MP:0008074), decreased CD4-positive T cell number (MP:0008075), etc., ...

## Experimental Design

- **Minimum number:** 3M + 3F
- **Age at test:** Week 16
- **Sex:** Both (sexually dimorphic)

## Equipment

### Equipment

- Scissors and forceps for biopsy
- Precision balance
- Calibrated single and multichannel pipettes
- Plate shaker
- Refrigerated centrifuge
- Flow Cytometer (capable of distinguishing a minimum of 8 colours per well)
- Tissue dissociator:
  - GentleMACS tissue dissociator ***OR***
  - Equipment for manual dissociation
- Cell counter equipment:
  - Orflo Moxi-Z Cell counter ***OR***
  - Coulter Vicell XR OR Life Technologies Attune® Flow Cytometer ***OR***
  - Haemocytometer

### Supplies

- 96-well V-bottomed plates (Falcon #353263)
- Petri dishes
- Dispensing troughs
- Low retention pipette tips for antibody solutions
- *(if using GentleMACS for dissociation)* C Tubes. It is acceptable to re-use these once.
- 50ml Falcon tubes
- Cell strainers e.g. 70m cell strainers that fit 50ml Falcon tubes (BD Falcon, #352350) ***OR*** 70-80µM Nytex
- Cell counter recipients (i.e., slides/cassettes/etc. for cell counter)
- *(if sample processing delayed)* RPMI 1640

- *(if sample processing on same day)* HBSS, with phenol red
- CS (calf serum)
- PBS with $Mg^{2+}$, with $Ca^{2+}$ (for enzyme buffer used for DNAse and Collagenase D digestions)
- PBS without $Mg^{2+}$, without $Ca^{2+}$ (for FACS buffer to be used in all steps subsequent to enzymatic digest)
- EDTA (0.5M stock; final concentration 2mM)
- Digestion enzyme (Collagenase D from Roche #11088858001), stock solution in enzyme buffer (see below), aliquoted and stored at –2 0°C
- DNAse I stock solution (Sigma, #DN25) in enzyme buffer (see below), aliquoted and stored at -20°C
- RBC lysis buffer (eBioscience #00-4300-54 or BD Biosciences #555899, both 10X from manufacturer)
- HEPES (pH 7.2-7.4)

# Procedure

This protocol requires several steps in the collection, preparation and analysis of the samples. Each one is detailed separately below.

**Reagent preparation**

*Note that two different PBS solutions are required for the protocol below, one with $Ca^{2+}$ and $Mg^{2+}$, another without $Ca^{2+}$ and $Mg^{2+}$.*

- **Collection buffer:**
  - (*if spleens are to be processed on the same day*) HBSS with $Ca^{2+}$ and $Mg^{2+}$ and phenol red (e.g. Life Technologies 14170161) ***OR***
  - (*if analysis will be delayed*) RPMI medium with 2% CS added.
- **FACS buffer** (for all steps subsequent to enzymatic digest; stable for up to 1 month in the fridge):
  - PBS 1X *without* $Ca^{2+}$/$Mg^{2+}$ ***OR***
  - HBSS 1X *without* $Ca^{2+}$/$Mg^{2+}$
  - EDTA 2mM
  - 2% (v/v) CS
  - 10mM HEPES, pH 7.2-7.4
- **Brilliant Stain Buffer** (BD 563794; for all steps when two or more brilliant violet antibodies are used to prevent non-specific dye-to-dye interaction)
- **Enzyme buffer** (for DNAse and Collagenase D digestions; Stable for up to 1 month in the fridge):
  - PBS *with* $Ca^{2+}$ and $Mg^{2+}$ ***OR***
  - HBSS 1X *with* $Ca^{2+}$/$Mg^{2+}$
  - 2% (v/v) CS;
  - 10mM HEPES, pH 7.2-7.4
- **RBC Lysis buffer**: Prepare a 1X solution in $ddH_20$ from 10X stock lysis buffer.
- **Stopping buffer** (require 300 µl per sample):
  - 1x PBS without $Ca^{2+}$ and $Mg^{2+}$ or 1X HBSS without $Ca^{2+}$ and $Mg^{2+}$
  - 0.1 M EDTA (37.5 g/L)

- **Antibody cocktails for Panels 1 & 2**
  - Protect antibodies and prepared cocktails from direct light.
  - Final concentration of antibodies should be determined by titration to ensure saturating amounts of antibody are used. Appropriate amounts of antibodies can be mixed together from the manufacturer's stock solutions and stored for 1 week at 4ºC prior to dilution in FACS buffer immediately before use. Do NOT pre-mix BV antibodies. These should be added fresh to the diluted staining mixure.
  - Each sample will require 50 µl (or up to 100 µl) of diluted 1X antibody cocktail.
  - Antibody cocktails should be gently but thoroughly mixed to ensure homogeneity of the solutions.
  - In order to eliminate aggregated antibodies from your mix, centrifuge each antibody cocktail for 8 min at 20,000x*g* and 8°C prior to staining cells.

- **Antibody Panels**

- Recommended antibody (marker) panels, Panel A for T, NKT and NK cells, Panel B for B, myeloid and NK cells are shown below, along with optional markers that may be used by some centres. Core antibodies are required for upload of data; optional markers are not and are listed in alphabetical order. Clones and fluorochromes used should be uploaded for required and optional markers. Where not indicated, clone and fluorochrome choice is dependent on available detectors and filters on the cytometer used at each centre.

*Panel A*

| Type | Antibody (Marker) | Clone | Fluorochrome |
|---|---|---|---|
| Required | CD5 | 53-7.3 | BV421 |
| Required | CD4 | RM4-5 | FITC |
| Required | CD44 | IM7 | PE |
| Required | CD8a | 53-6.7 | PE-CF594 |
| Required | CD25 | PC61 | PE-Cy7 |
| Required | CD161 | PK136 | APC |
| Required | CD62L | MEL-14 | APC-Cy7 |
| Required | Live/Dead | - | SytoxBlue |

| | | | |
|---|---|---|---|
| Optional | CD3e | 145-2C11 | |
| Optional | CD24 | M1/69 | |
| Optional | CD27 | LG.3A10 | |
| Optional | CD357/GITR | DTA-1 | |
| Optional | CD45 | 30-F11 | |
| Optional | KLRG1 | 2F1 | |
| Optional | Ly6c | AL-21 | |
| Optional | TCRd | GL-3 | |

*Panel B*

| Type | Antibody (Marker) | Clone | Fluorochrome |
|---|---|---|---|
| Required | CD5 | 53-7.3 | BV421 |
| Required | Ly6G | 1A3 | BV421 |
| Required | CD19 | 1D3 | BV510 |
| Required | Ly6C | AL-21 | FITC |
| Required | CD21/CD35 | 7G6 | PE |
| Required | CD11b | M1/70 | PE-CF594 |

| | | | |
|---|---|---|---|
| Required | CD11c | HL3 | PE-Cy7 |
| Required | CD161 | PK136 | APC |
| Required | MHCII | M5/114.15.2 | APC-Cy7 or A700 |
| Required | Live/Dead | - | SytoxBlue |
| Optional | CD23 | B3B4 | |
| Optional | CD27 | LG3.A10 | |
| Optional | CD43 | S7 | |
| Optional | CD44 | | |
| Optional | CD45 | 30-F11 | |
| Optional | CD317 | 927 | |
| Optional | F4/80 | BM8 | |
| Optional | IgD | | |
| Optional | KLRG | 2F1 | |

- **Read buffer / dead cell exclusion dye**
    - SytoxBlue at 1:10000 concentration in FACS buffer ***OR***
    - SytoxGreen at 1:20000 concentration in FACS buffer
    - Zombie Near Infra-Red live dead from Biolegend at 1:2000 concentration
    - Require 200 l per well (i.e. 400 l for each spleen).
- **Enzyme cocktail (working solution):** 3 ml for each spleen, containing final concentrations of:
    - DNAse I: 30-100 g (from 10 mg/ml stock in enzyme buffer stored in single experiment aliquots at -20ºC, do not freeze-thaw stock)

- Collagenase D: 600 Mandl Units (from 30 U/µl stock in enzyme buffer stored in single experiment aliquots at -20ºC, do not freeze-thaw stock)

***NOTE*:** To top up to the 3ml use enzyme buffer; any intermediate dilutions of the enzyme stock solutions should be prepared with enzyme buffer.

**Other preparations on the day**

- Bring RBC lysis buffer and stop solution to room temperature.
- Prepare wet ice box, label tubes, etc.

**Note all centrifuge steps are: 5 min, 400 x g at 8°C**

**Spleen collection**

- Collect the spleen from euthanized mice.
- Remove all fat from the spleen and weigh the organ on a petri dish (do not hydrate the organ before weighing it as this would lead to substantial errors in measurement).
- Place the spleen in a 1.5ml eppendorf tube with 1 mL of sample collection buffer on ice. Use:
  - *(if spleens are to be processed on the same day)* HBSS without calcium, without magnesium but with phenol red ***OR***
  - *(if analysis will be delayed)* RPMI with 2% CS buffer.

**Spleen dissociation / digests**

**If using a GentleMacs tissue dissociator:**

- Add the spleen to a GentleMACS C tube containing 3 ml of 1X enzyme cocktail.
- Clip the tube on GentleMACS dissociator and run programme spleen_2.
- Incubate cell suspension for 30 minutes with gentle mixing at least every 5 minutes. Register incubation temperature.
- Run programme spleen_3.
- Add 300 L of stopping buffer and mix by inversion to block enzymatic digestion and dissociate T cell-dendritic cell interactions.
- Filter cell suspension:
  - through 70-80 m Nylon mesh filter into a 50 mL Falcon tube ***OR***
  - directly from C-tubes pour splenocyte suspension through 30 µm CellTrics Partec filters (#04-0042-2316) into 15 ml tubes.
- *(optional)* Wash the GentleMACS C tube with 5ml FACS buffer, filter and pool with flow-through from previous step.
- Centrifuge for 5 minutes, 400 x g at 8°C and discard supernatant.
- Resuspend total splenocytes in 1 mL cold FACS buffer and keep on ice (this step is not required if counting is performed on the attune).

**OR, if performing manual digests:**

- Place weighed spleen in 12x75mm tube containing 1ml of collagenase solution in 1X HBSS with $Ca^{2+}$ and $Mg^{2+}$ (17-0.2 Wünsch unit/ml)
- Mince into fine pieces using small scissors, place on ice until all samples are minced.

- Add 2ml collagenase (17-0.2 Wünsch unit/ml) to each tube and place in a 37ºC water bath for 30 minutes.
- Tricturate (pipetting vigorously up and down using a 1 mL pipetman) the mixture to break up clumps.
- Spin at 500 x g in a swing bucket rotor for 5 min at 10ºC. Decant the supernatant, rack the tubes or vortex to resuspend the pellet. Add 2ml FACS buffer, mix well by vortexing, take 10 µl for the counting step.
- Dilutions for counting: 2 serial 1:10 dilutions (10µl cells + 90µl FACS buffer, then 10µl of the 1:10 dilution + 90µl buffer.)
- Spin for 5min, 500 x g at 10ºC, decant supernatant, blot the top of the tube, resuspend pellet at $1x10^8$ cells/ml.

**Cell counting**

- Perform a cell count on an aliquot of the re-suspended cells (adjust concentration according to the cell counter method used).
- Note the cell count, correct for dilution and calculate the concentration in cells per µl.
- Cell count:
  - *If performed before RBC lysis*, pipette the volume containing approximately 4 million cells/well to a 96 well plate in horizontal fashion starting from A1 onwards for panel 1 staining.
  - *If performed after RBC lysis*, pipette the volume containing approximately 1-2 million cells/well to a 96 well plate in horizontal fashion starting from A1 onwards for panel 1 staining.
- Do the same for panel 2 staining in separate wells leaving a few empty rows between the panels to avoid cross contamination.
- Top up to final volume of 100 µl using FACS buffer, centrifuge, discard supernatant and keep plate on wet ice.

**Red blood cell lysis, blocking & staining**

- Remove plate from ice and add 30 to 100 µl of 1X RBC lysis buffer (at room temperature) to each cell pellet from the previous step.
- Pipette up and down 2-3 times to break up the pellet and ensure complete lysis. Alternatively, vortex the edges of the plates, then pipet quickly once to ensure resuspension is ideal for optimal lysis.
- Incubate for 1 minute at room temperature and then return to ice and add 100 to 200 µl of FACS buffer (to stop lysis) to each well.

**Note**: *Following RBC lysis, every centrifugation step can be performed at 2000rpm for 1 minute in a 96 well plate, which significantly speeds up the protocol. Do take care to resuspend the cells very well to prevent HTS clumping.*

- Centrifuge, discard supernatant and resuspend in 200 µl FACS buffer (this step is not required if lysis was performed in 30 µl, since there will be enough volume left in the well for a bigger wash of 200 µl; saves time on a spin).
- Again centrifuge and discard supernatant and resuspend in 50 µl of 1:100 Fc block and incubate on ice for 10 min. Top up to 200 µl using FACS buffer after incubation.

- Take antibody (AB) cocktails from the fridge.  In order to eliminate aggregated ABs from your mix before use, centrifuge each AB cocktail for 8 min at 20,000 x g and 4°C. Dilute antibody cocktail to final working concentration with FACS buffer, or Brilliant stain buffer when two or more brilliant violet antibodies are used, to make the AB mix.
- Centrifuge plate, discard supernatant and resuspend in 50 to 100 µl 1X AB mix in appropriate wells for individual panels followed by incubation on ice and in the dark for 20 min.
- If using Sytox Blue/Sytox Green as live/dead discriminator:
    - Top up to 200 µl with FACS or Brilliant Stain buffer after incubation. Centrifuge, discard supernatant and resuspend in 200 µl FACS or Brilliant Stain buffer.
    - When ready to read plate, centrifuge again and discard supernatant. Resuspend the pellet in 200 µl of read buffer (Sytox Blue diluted 1:10000 in FACS buffer; Sytox Green diluted 1:20000 in FACS buffer).

- If using Zombie NIR dye as live/dead discriminator:
    - Add 200 µl of PBS (RT) to all samples
    - Spin at 2000 rpm for 1 minute 8°C
    - Add 100 µl/well of Zombie Near-IR Live/Dead dye (1/2000) made up in PBS incubate at room temperature for 10 mins, add 200 µl FACS buffer.

**General Recommendations for Setting up Cytometer**

Set up the analyser to aim acquire 300,000 viable events (live cells) for each of Panels 1 and 2. 500,000 are recommended for panel 2 in order to increase robustness of myeloid population assessment for low frequency populations (macrophages, DCs).

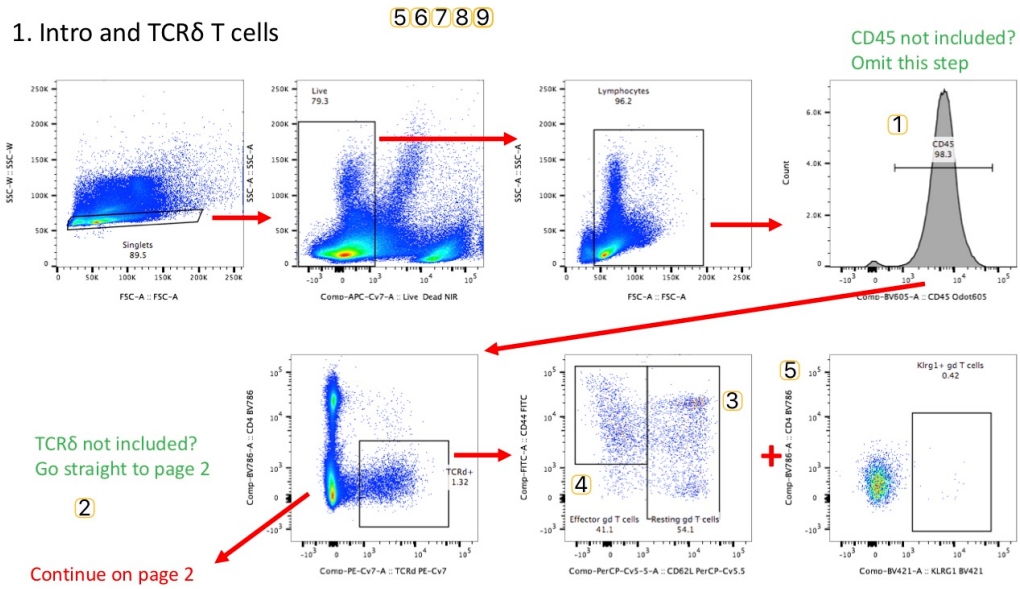
# Notes

**Visual help for Gating**

## APPENDIX 1. GATING HIERARCHIES

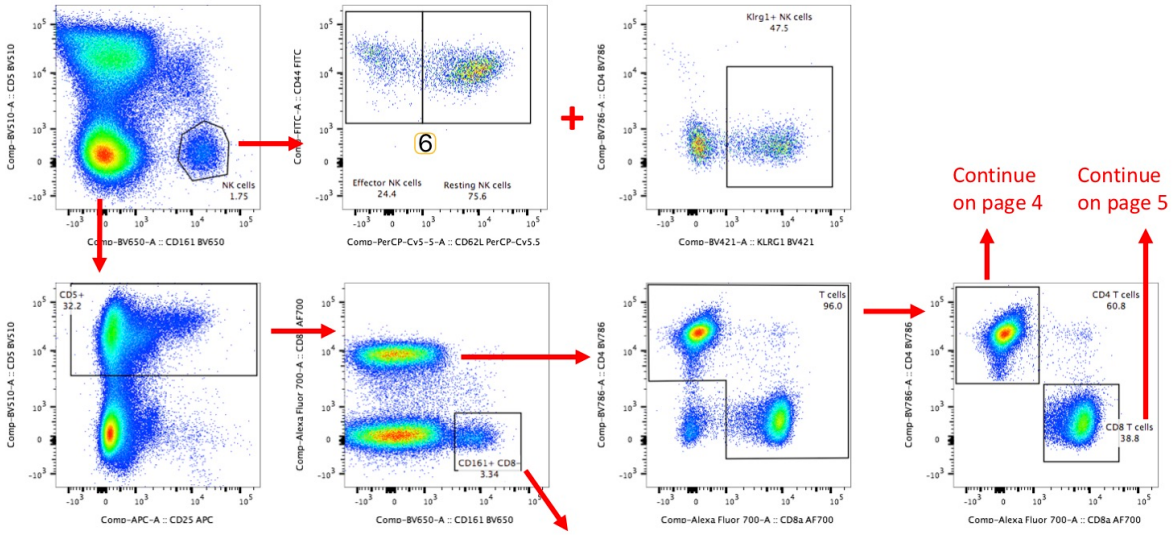
***Panel A. Page 1***

1. Intro and TCRδ T cells



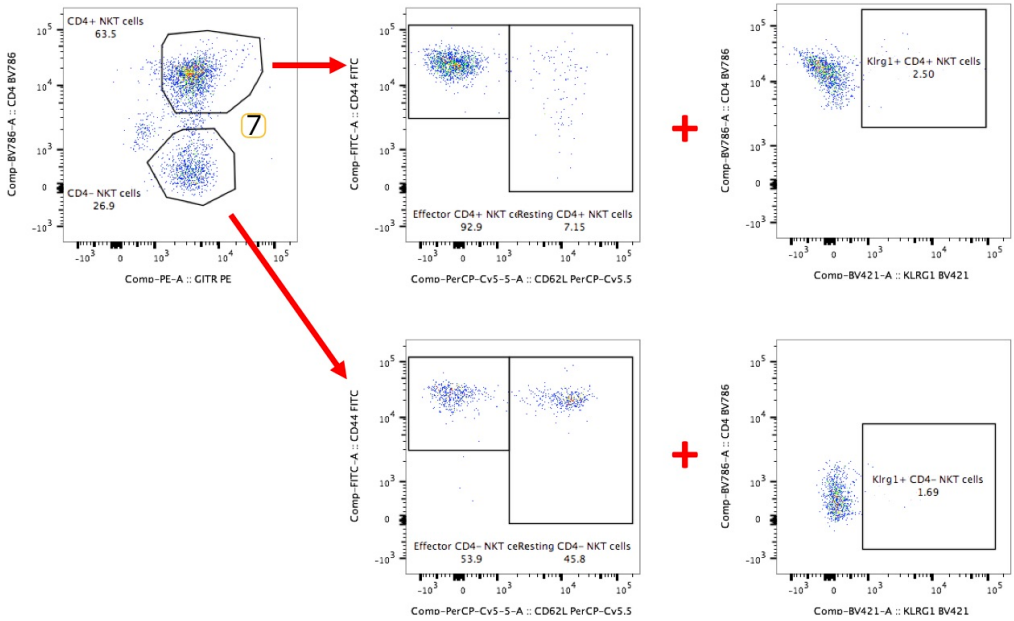
***Panel A. Page 2.***

## 2. NK cells and further gating



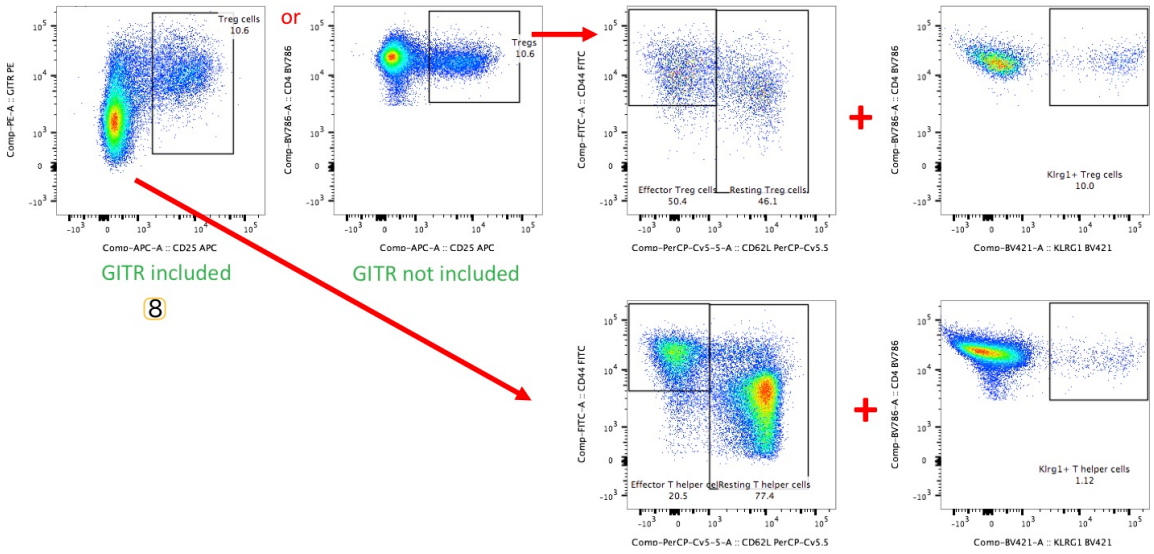
***Panel A. Page 3.***

## 3. NKT cells



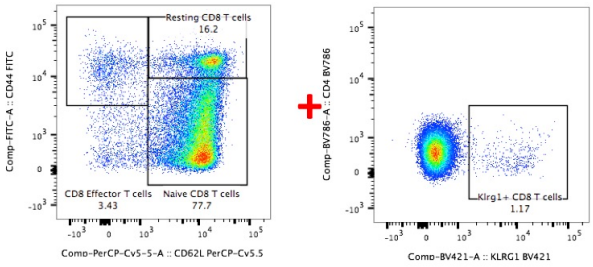
***Panel A. Page 4.***

## 4. Tregs and T helper cells



***Panel A. Page 5.***

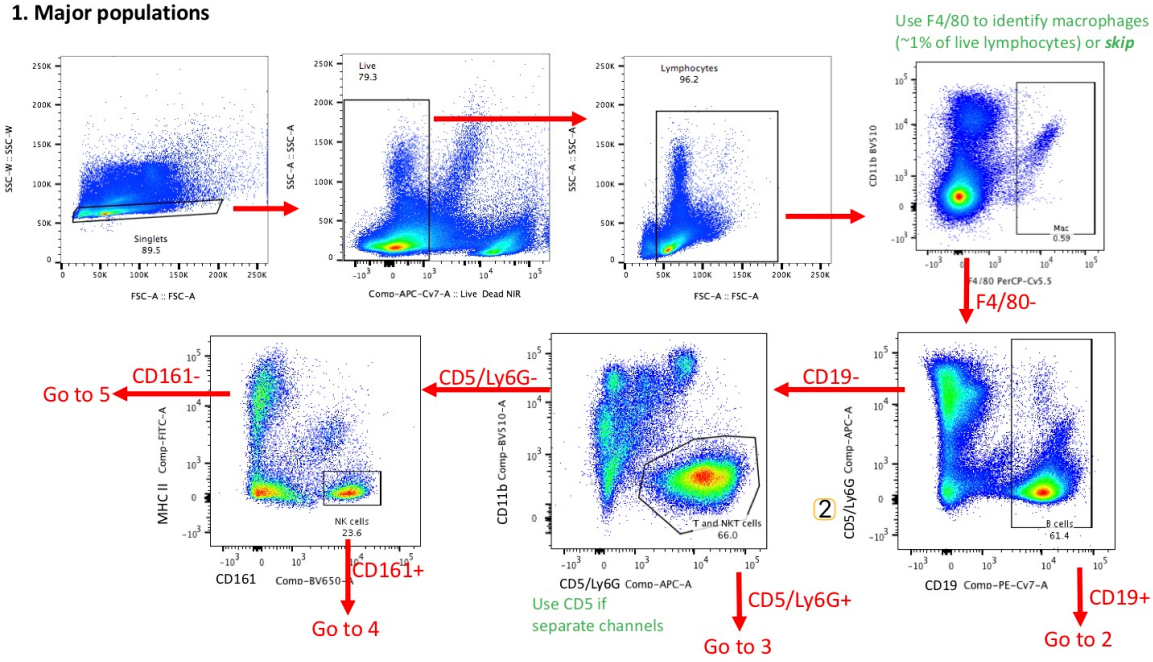
## 5. CD8 T cells and notes



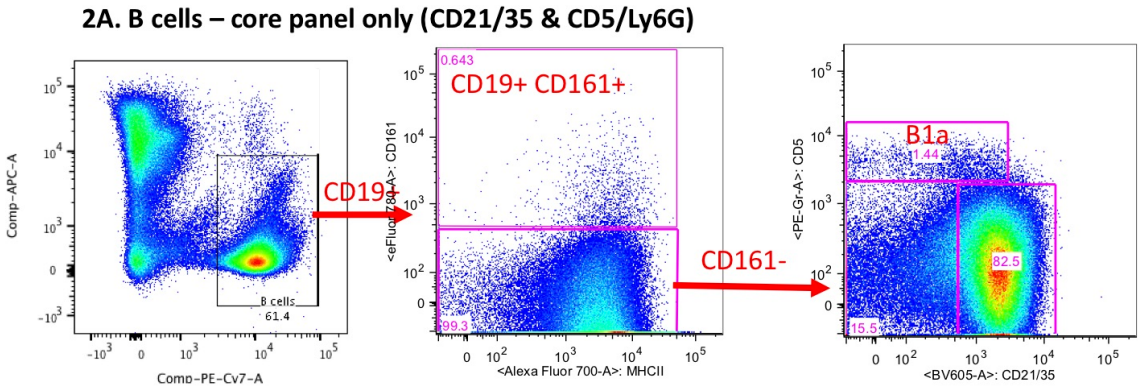

1. If there is no CD45 in the panel, omit this step.
2. Approximately 50% of γδ T cells are CD5-, so they will drop out when gating on CD5 later on. Of the remaining cells, approximately 90% are CD4- CD8- and will drop out of the T cell gate. Only 5% (approximately 0.2% of lymphocytes) will end up in the CD8 T cell gate which is negligible .
3. Please note that each cell type requires different thresholds for both CD44 and CD62L.
4. CD44- CD62L- cells do not occur naturally and show up when CD62L is shed from resting cells during sample preparation.
5. I have chosen CD4 for the y axis because gives a nice compact population for almost all cell types which makes it easy to see the Klrg1+ cells. However, if CD4 doesn't work for you because of your fluorochrome combinations, it can be substituted by any other marker.
6. The name effector is fine for CD4 and CD8 T cells, it is a bit unusual for γδ T cells, NKT cells and NK cells. We settled for this term in the end and also added these population names (with a more detailed description) to the MGI ontology, so MP terms that we use now carry these names.
7. These need to be added up to give the counts of total NKT cells. Use any fluorochrome on the y axis that gates out the non-specific autofluorescent population between the two distinct populations
8. If you don't have GITR, use CD4 on the y axis instead. It works almost as well.

***Panel B. Page 1.***

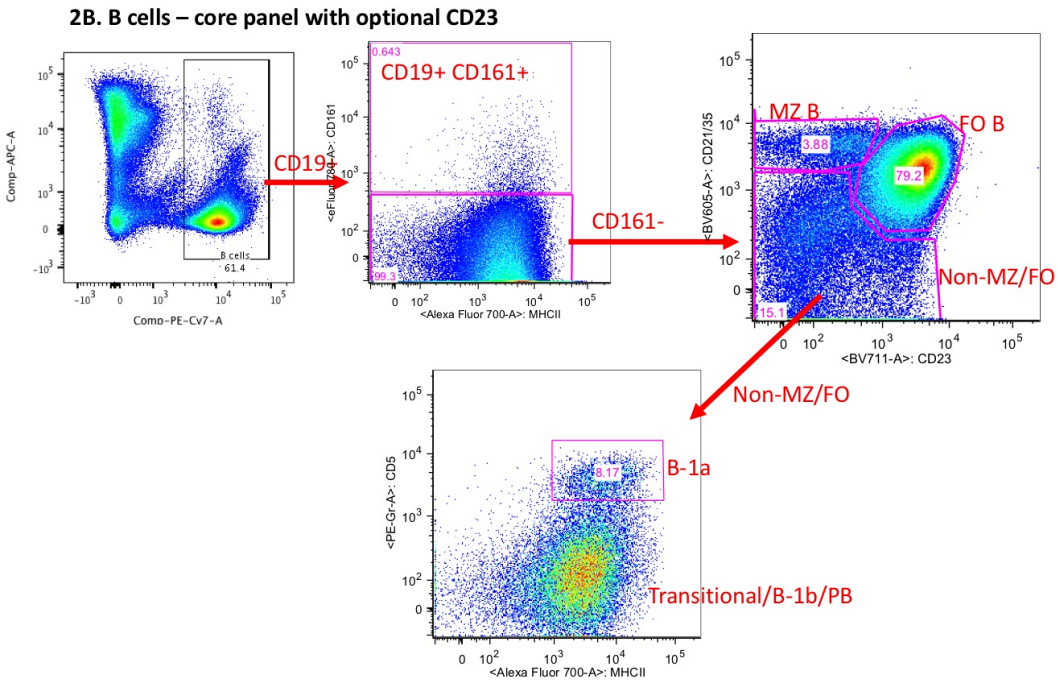
**1. Major populations**



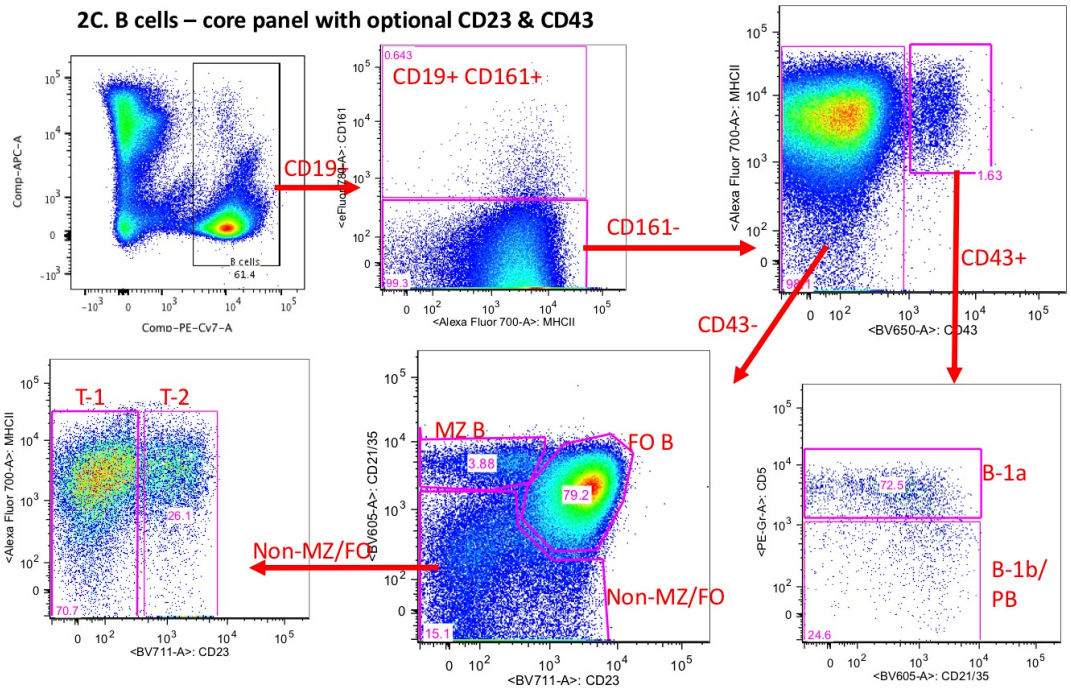
***Panel B. Page 2A.***



***Panel B. Page 2B.***

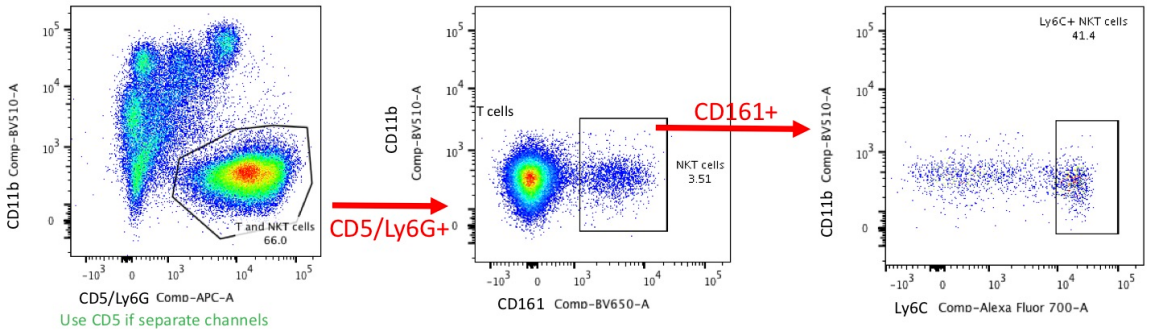


***Panel B. Page 2C.***



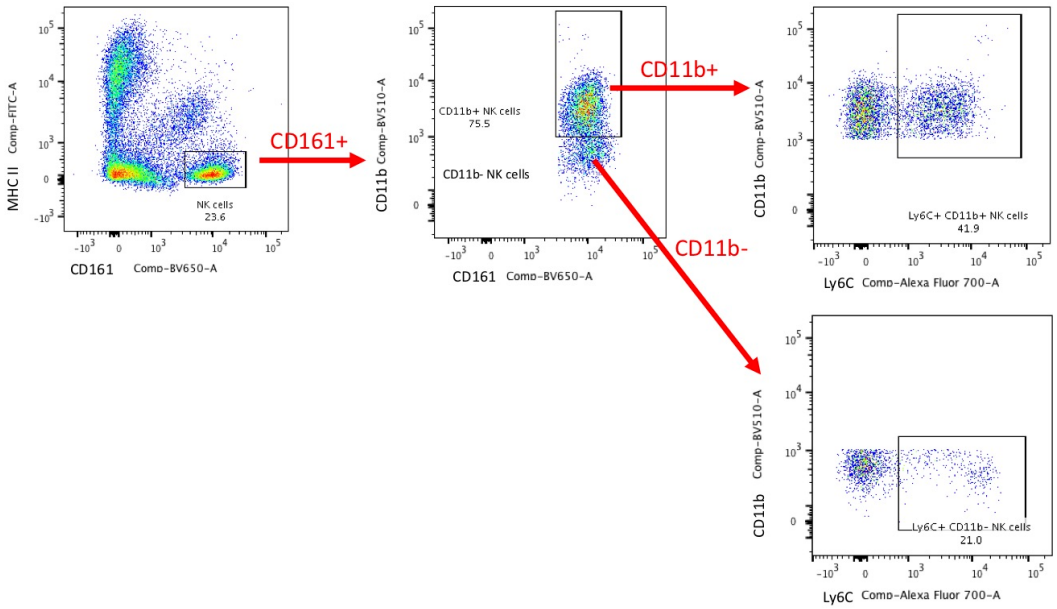
***Panel B. Page 3.***

## 3. T cells and NK T cells

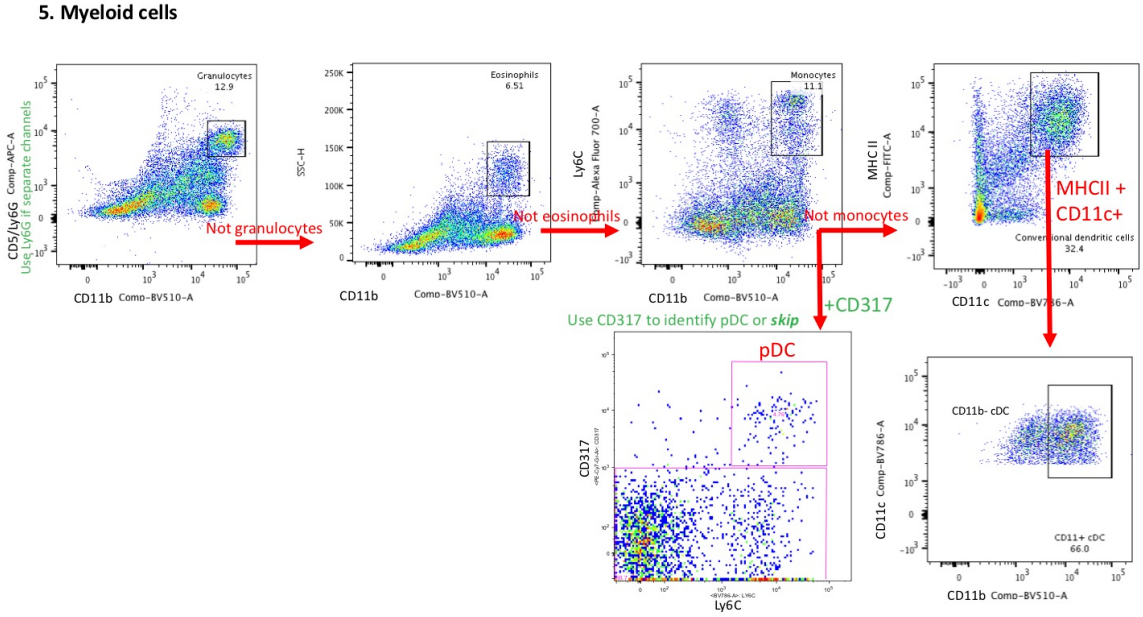


***Panel B. Page 4.***

**4. NK cells**



***Panel B. Page 5.***




## Parameters and Metadata

## Spleen weight IMPC_IMM_001_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** g

---

## Live leukocytes (Panel A) - % of total events IMPC_IMM_002_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## T cells (Panel A) - % of live leukocytes (Panel A) IMPC_IMM_003_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## NKT cells (panel A) - % of live leukocytes (Panel A) IMPC_IMM_004_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## NK cells (Panel A) - % of live leukocytes (Panel A) IMPC_IMM_005_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## CD4 T cells - % of live leukocytes (Panel A) IMPC_IMM_007_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## CD8+ T cells - % of live leukocytes (Panel A) IMPC_IMM_008_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## CD4+ NKT cells - % of live leukocytes (Panel A) IMPC_IMM_011_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## CD4- NKT cells - % of live leukocytes (Panel A) IMPC_IMM_013_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Treg cells - % of live leukocytes (Panel A) IMPC_IMM_014_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## CD4+ T helper cells - % of live leukocytes (Panel A) IMPC_IMM_015_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Total events (Panel A) IMPC_IMM_026_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Total events (Panel B) IMPC_IMM_027_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Effector CD4+ T helper cells - % of live leukocytes (Panel A) IMPC_IMM_028_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Resting CD4+ T helper cells - % of live leukocytes (Panel A) IMPC_IMM_029_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Effector CD8+ T cells - % of live leukocytes (Panel A) IMPC_IMM_032_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## NaÃ¯ve CD8+ T cells - % of live leukocytes (Panel A)IMPC_IMM_033_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Resting CD8+ T cells - % of live leukocytes (Panel A) IMPC_IMM_034_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Effector CD4+ NKT cells - % of live leukocytes (Panel A) IMPC_IMM_040_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** true

**Unit Measured:** %

---

## Resting CD4+ NKT cells - % of live leukocytes (Panel A) IMPC_IMM_041_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Effector CD4- NKT cells - % of live leukocytes (Panel A) IMPC_IMM_046_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Resting CD4- NKT cells - % of live leukocytes (Panel A) IMPC_IMM_047_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Live leukocytes (Panel B) - % of total events (Panel B) IMPC_IMM_049_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Granulocytes - % of live leukocytes (Panel B) IMPC_IMM_050_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Monocytes - % of live leukocytes (Panel B) IMPC_IMM_051_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Eosinophils - % of live leukocytes (Panel B) IMPC_IMM_052_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## NK cells (Panel B) - % of live leukocytes (Panel B) IMPC_IMM_053_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ CD11b- NK cells - % of live leukocytes (Panel B) IMPC_IMM_054_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ CD11b+ NK cells - % of live leukocytes (Panel B) IMPC_IMM_055_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## CD11b- NK cells - % of live leukocytes (Panel B) IMPC_IMM_056_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## CD11b+ NK cells - % of live leukocytes (Panel B) IMPC_IMM_057_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## NKT cells (panel B) - % of live leukocytes (Panel B) IMPC_IMM_058_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ NKT cells - % of live leukocytes (Panel B) IMPC_IMM_059_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## T cells (panel B) - % of live leukocytes (Panel B) IMPC_IMM_061_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## B cells - % of live leukocytes (Panel B) IMPC_IMM_063_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Follicular B cells - % of B cells (Panel B) IMPC_IMM_067_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** true **Is Annotated:** false

**Unit Measured:** %

---

## Marginal zone B cells - % of B cells (Panel B) IMPC_IMM_071_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Conventional DC - % of live leukocytes (Panel B) IMPC_IMM_072_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Plasmacytoid DC- % of live leukocytes (Panel B) IMPC_IMM_074_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Macrophages- % of live leukocytes (Panel B) IMPC_IMM_075_002 | v2.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Equipment name IMPC_IMM_077_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** FACS, Flow cytometer, Fortessa_1, LSR II, Fortessa_I Custom Build,

---

## Equipment manufacturer IMPC_IMM_078_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BD Biosciences, Beckman Coulter, IntelliCyt, Cytek,

---

## Equipment model IMPC_IMM_079_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BD LSR-II, BD LSRFortessa Cell Analyzer, CANTO-II, FACSAria III, Gallios, H47100123, iQue Screener PLUS, Aurora,

---

## CS&T Bead lot IMPC_IMM_080_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Anesthesia IMPC_IMM_081_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Injection narcosis with Ketamine (100mg/kg)/Xylazine (10mg/kg), Injection narcosis with Sodium Pentobarbital (Somnopentyl), Injection narcosis with Tribromoethanol (Avertin), Isoflurane, none, Injection narcosis with Medetomidine/Midazolam/Butorphanol,

## Cell digestion IMPC_IMM_082_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** GentleMACS, manual,

---

## Cell digestion agent IMPC_IMM_083_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Collagenase D, Collagenase II, Spleen dissociation kit, manual,

---

## Cell digestion agent manufacturer IMPC_IMM_084_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Gibco, Roche, Worthington, Miltenyi Biotec, manual, Sigma,

---

## Cell digestion agent catalog number IMPC_IMM_085_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** #11088858001, 17101-015, CLS2LS004176, 130-095-926, manual, C6885,

---

## Cell counting performed IMPC_IMM_086_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** post-lysis, pre-lysis,

---

## Cell counting equipment manufacturer IMPC_IMM_087_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** American Optical, BD Biosciences, Beckman Coulter, Life Technologies, Merck Millipore, Orflo, IntelliCyt, Nextcelom,

---

## Cell counting equipment model IMPC_IMM_088_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 4468770, Attune, BD LSR-II, Countess Automated Cell Counter, Gallios, Moxi Z, Reichert Brightline, Scepter, Cellometer Auto T4, iQue Screener PLUS,

---

## Cell counting equipment name IMPC_IMM_089_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Cellometer Auto T4,

---

## Cell lysis buffer manufacturer IMPC_IMM_090_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BD PharmLyse, eBioscience, Jax, JMC, LONZA, In house,

---

## Cell lysis buffer catalog number IMPC_IMM_091_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 00-4300-54, 10-548E, 555899, home brew, In house,

## Date and time of sacrifice IMPC_IMM_092_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

## Date and time of sample preparation IMPC_IMM_093_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

## Sample storage temperature until analysis (in Celsius) IMPC_IMM_094_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** C

**Options:** 8,

## FCS repository reference (URL/ID) IMPC_IMM_095_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Balanced salt solution type IMPC_IMM_096_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** HBSS, PBS, KDS BSS,

---

## Balanced salt solution manufacturer IMPC_IMM_097_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Biochrom, Gibco, Life Technologies, Sigma, Wako, Wisent, home brew, In house,

---

## Balanced salt solution catalog number IMPC_IMM_098_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 041-20211, 14175-095, 14190-144, D1408, H6136-1L, HBSS 1X 14170-088, L 182-10, home brew, 14190169, In house,

---

## RPMI manufacturer IMPC_IMM_099_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Gibco, Jax, Life Technologies, none used, Sigma, Wako, Thermo Fisher Scientific,

---

## RPMI catalog number IMPC_IMM_100_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 11875-093, 11875-101, 189-02145, 31800-022, home brew, none used, R8758,

---

## DNAse I manufacturer IMPC_IMM_101_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Sigma, Spleen Dissociation Kit, N/A,

---

## DNAse I catalog number IMPC_IMM_102_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** D8764, DN25, N/A, none used,

---

## Dead cell exclusion dye IMPC_IMM_103_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** DAPI, Propidium Iodide, Sytox Blue, Sytox Green, Zombie NIR, LIVE/DEAD Fixable Aqua stain, Ghost Dye UV450,

---

## Dead cell exclusion dye manufacturer IMPC_IMM_104_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Biolegend, home brew, Life Technologies, Sigma, Invitrogen by Thermo Fisher, Tonbo biosciences,

---

## Dead cell exclusion dye catalog number IMPC_IMM_105_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 423106, D9542, home brew, R37606, S-34860, S11348, S34857, P4170, L34966, 13-0868-T500,

---

## Cell digestion temperature (in Celsius) IMPC_IMM_106_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 37, RT, N/A,

---

## Panel A FCS file(s) IMPC_IMM_107_002 | v2.0

seriesMediaParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B FCS file(s) IMPC_IMM_108_002 | v2.0

seriesMediaParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Automated analysis IMPC_IMM_109_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** No, Yes,

---

## Collection buffer manufacturer IMPC_IMM_110_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Life Technologies, BD Biosciences, Wako, home brew,

---

## Collection buffer catalog number number IMPC_IMM_111_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 24020, 563503, 084-08965,

---

## FACS buffer manufacturer IMPC_IMM_112_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Life Technologies, In house, Wako, home brew,

---

## FACS buffer catalog number IMPC_IMM_113_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 14175, In house, 048-29805, home brew,

---

## Enzyme buffer manufacturer IMPC_IMM_114_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** Life Technologies, N/A, Wako, Miltenyi Biotec,

---

## Enzyme buffer catalog number IMPC_IMM_115_002 | v2.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** 14025, N/A, 084-08965, 130-095-926,

## Total spleen leukocyte count IMPC_IMM_116_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Clog- events (Panel A) IMPC_IMM_117_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## FSC/SSC Singlets (Panel A) IMPC_IMM_118_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Effector NK cells - % of live leukocytes (Panel A) IMPC_IMM_119_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector Treg cells - % of live leukocytes (Panel A) IMPC_IMM_120_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector  T cells - % of live leukocytes (Panel A) IMPC_IMM_121_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ CD4- NKT cells - % of live leukocytes (Panel A) IMPC_IMM_122_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+ CD4+ NKT cells - % of live leukocytes (Panel A) IMPC_IMM_123_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+ CD4+ T helper cells - % of live leukocytes (Panel A) IMPC_IMM_124_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+ CD8 T cells - % of live leukocytes (Panel A) IMPC_IMM_125_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+ NK cells - % of live leukocytes (Panel A) IMPC_IMM_126_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+ Treg cells - % of live leukocytes (Panel A) IMPC_IMM_127_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Klrg1+  T cells - % of live leukocytes (Panel A) IMPC_IMM_128_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Resting NK cells - % of live leukocytes (Panel A) IMPC_IMM_129_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting Treg cells - % of live leukocytes (Panel A) IMPC_IMM_130_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting  T cells - % of live leukocytes (Panel A) IMPC_IMM_131_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## T cells - % of live leukocytes (Panel A) IMPC_IMM_132_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## T cells - % of live leukocytes (Panel A) IMPC_IMM_133_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD4- NKT cells - % of NKT cells (Panel A) IMPC_IMM_134_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD4+ NKT cells - % of NKT cells (Panel A) IMPC_IMM_135_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD4+ T cells - % of T cells IMPC_IMM_136_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD4+ T helper cells - % of CD4 T cells IMPC_IMM_137_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD8+ T cells - % of T cells IMPC_IMM_138_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector CD4- NKT cells - % of CD4- NKT cells IMPC_IMM_139_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector CD4+ NKT cells - % of CD4+ NKT cells IMPC_IMM_140_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector CD4+ T helper cells - % of CD4+ T helper cells IMPC_IMM_141_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector CD8+ T cells - % of CD8+ T cells IMPC_IMM_142_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector NK cells - % of NK cells (Panel A) IMPC_IMM_143_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector Treg cells - % of Treg cells IMPC_IMM_144_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Effector  T cells - % of  T cells IMPC_IMM_145_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ CD4- NKT cells - % of CD4- NKT cells IMPC_IMM_146_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ CD4+ NKT cells - % of CD4+ NKT cells IMPC_IMM_147_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ CD4+ T helper cells - % of CD4+ T helper cells IMPC_IMM_148_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ CD8 T cells - % of CD8+ T cells IMPC_IMM_149_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ NK cells - % of NK cells (Panel A) IMPC_IMM_150_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ Treg cells - % of Treg cells IMPC_IMM_151_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Klrg1+ T cells - % of T cells IMPC_IMM_152_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Naïve CD8+ T cells - % of CD8+ T cells IMPC_IMM_153_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting CD4- NKT cells - % of CD4- NKT cells IMPC_IMM_154_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting CD4+ NKT cells - % of CD4+ NKT cells IMPC_IMM_155_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting CD4+ T helper cells - % of CD4+ T helper cells IMPC_IMM_156_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting CD8+ T cells - % of CD8+ T cells IMPC_IMM_157_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting NK cells - % of NK cells (Panel A) IMPC_IMM_158_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting Treg cells - % of Treg cells IMPC_IMM_159_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Resting  T cells - % of  T cells IMPC_IMM_160_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

## Treg cells - % of CD4 T cells IMPC_IMM_161_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Clog- events (Panel B) IMPC_IMM_162_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## FSC/SSC Singlets (Panel B) IMPC_IMM_163_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## B1a cells - % of B cells (Panel B) IMPC_IMM_164_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## B1b cells - % of B cells (Panel B) IMPC_IMM_165_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD11b-high cDC - % of conventional DC (Panel B) IMPC_IMM_166_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD11b-low cDC - % of conventional DC (Panel B) IMPC_IMM_167_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD161+ B cells - % of live leukocytes (Panel B) IMPC_IMM_168_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Transitional 1 B cells - % of B cells (Panel B) IMPC_IMM_169_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Transitional 2 B cells - % of B cells (Panel B) IMPC_IMM_170_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD11b- NK cells - % of NK cells (Panel B) IMPC_IMM_171_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD11b+ NK cells - % of NK cells (Panel B) IMPC_IMM_172_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## CD161+ B cells - % of B cells IMPC_IMM_173_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Follicular B cells - % of B cells IMPC_IMM_174_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ CD11b- NK cells - % of NK cells (Panel B) IMPC_IMM_175_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ CD11b+ NK cells - % of NK cells (Panel B) IMPC_IMM_176_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Ly6C+ NKT cells - % of NKT cells (Panel B) IMPC_IMM_177_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Marginal zone B cells - % of B cells IMPC_IMM_178_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Transitional 1 Bcells - % of B cells IMPC_IMM_179_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## Transitional 2 B cells - % of B cells IMPC_IMM_180_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** %

---

## T cells (Panel A) - cell count IMPC_IMM_181_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## T cells - cell count IMPC_IMM_182_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD8+ T cells - cell count IMPC_IMM_183_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector CD8+ T cells - cell count IMPC_IMM_184_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting CD8+ T cells - cell count IMPC_IMM_185_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Naïve CD8+ T cells - cell count IMPC_IMM_186_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ CD8 T cells - cell count IMPC_IMM_187_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD4 T cells - cell count IMPC_IMM_188_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD4+ T helper cells - cell count IMPC_IMM_189_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector CD4+ T helper cells - cell count IMPC_IMM_190_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting CD4+ T helper cells - cell count IMPC_IMM_191_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ CD4+ T helper cells - cell count IMPC_IMM_192_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Treg cells - cell count IMPC_IMM_193_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector Treg cells - cell count IMPC_IMM_194_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting Treg cells - cell count IMPC_IMM_195_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ Treg cells - cell count IMPC_IMM_196_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## T cells - cell count IMPC_IMM_197_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector  T cells - cell count IMPC_IMM_198_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting  T cells - cell count IMPC_IMM_199_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+  T cells - cell count IMPC_IMM_200_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## NKT cells (panel A) - cell count IMPC_IMM_201_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## CD4+ NKT cells - cell count IMPC_IMM_202_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## Effector CD4+ NKT cells - cell count IMPC_IMM_203_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## Resting CD4+ NKT cells - cell count IMPC_IMM_204_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ CD4+ NKT cells - cell count IMPC_IMM_205_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD4- NKT cells - cell count IMPC_IMM_206_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector CD4- NKT cells - cell count IMPC_IMM_207_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting CD4- NKT cells - cell count IMPC_IMM_208_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ CD4- NKT cells - cell count IMPC_IMM_209_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## NK cells (Panel A) - cell count IMPC_IMM_210_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Effector NK cells - cell count IMPC_IMM_211_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Resting NK cells - cell count IMPC_IMM_212_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Klrg1+ NK cells - cell count IMPC_IMM_213_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## T cells (panel B) - cell count IMPC_IMM_214_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## NKT cells (panel B) - cell count IMPC_IMM_215_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Ly6C+ NKT cells - cell count IMPC_IMM_216_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## NK cells (Panel B) - cell count IMPC_IMM_217_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## CD11b- NK cells - cell count IMPC_IMM_218_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Ly6C+ CD11b- NK cells - cell count IMPC_IMM_219_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD11b+ NK cells - cell count IMPC_IMM_220_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Ly6C+ CD11b+ NK cells - cell count IMPC_IMM_221_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## B cells - cell count IMPC_IMM_222_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## B1a cells - cell count IMPC_IMM_223_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## B1b cells - cell count IMPC_IMM_224_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Follicular B cells - cell count IMPC_IMM_225_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Marginal zone B cells - cell count IMPC_IMM_226_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Transitional 1 B cells - cell count IMPC_IMM_227_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Transitional 2 B cells - cell count IMPC_IMM_228_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD161+ B cells - cell count IMPC_IMM_229_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Conventional DC - cell count IMPC_IMM_230_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD11b-low cDC - cell count IMPC_IMM_231_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## CD11b-high cDC - cell count IMPC_IMM_232_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Plasmacytoid DC - cell count IMPC_IMM_233_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Macrophages - cell count IMPC_IMM_234_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

## Monocytes - cell count IMPC_IMM_235_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Granulocytes - cell count IMPC_IMM_236_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Eosinophils - cell count IMPC_IMM_237_001 | v1.0

simpleParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Unit Measured:** count

---

## Panel A anti-CD5 clone IMPC_IMM_238_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD5 fluorochrome IMPC_IMM_239_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BV421, eF450,

---

## Panel A anti-CD5 RRID IMPC_IMM_240_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_2737758, AB_1603250,

---

## Panel A anti-CD4 clone IMPC_IMM_241_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** RM4-5, GK1.5,

## Panel A anti-CD4 fluorochrome IMPC_IMM_242_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** FITC, PO,

---

## Panel A anti-CD4 RRID IMPC_IMM_243_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_394583, AB_1474250, AB_396633,

---

## Panel A anti-CD44 clone IMPC_IMM_244_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD44 fluorochrome IMPC_IMM_245_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE, BV650,

---

## Panel A anti-CD44 RRID IMPC_IMM_246_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_394649, AB_2562600, AB_10895375,

---

## Panel A anti-CD8a clone IMPC_IMM_247_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD8a fluorochrome IMPC_IMM_248_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE-CF594, APCeF780,

---

## Panel A anti-CD8a RRID IMPC_IMM_249_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_11152075, AB_1272185,

---

## Panel A anti-CD25 clone IMPC_IMM_250_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD25 fluorochrome IMPC_IMM_251_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE-Cy7, APC,

---

## Panel A anti-CD25 RRID IMPC_IMM_252_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_394509, AB_398623, AB_10562035,

---

## Panel A anti-CD161 clone IMPC_IMM_253_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD161 fluorochrome IMPC_IMM_254_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** APC, PE, PE-Cy7,

---

## Panel A anti-CD161 RRID IMPC_IMM_255_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_398463, AB_394677, AB_394507,

---

## Panel A anti-CD62L clone IMPC_IMM_256_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A anti-CD62L fluorochrome IMPC_IMM_257_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** APC-Cy7, PE-Cy7,

---

## Panel A anti-CD62L RRID IMPC_IMM_258_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_10611861, AB_469633,

---

## Panel A Live/Dead stain IMPC_IMM_259_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PI, Aqua, Sytox Blue,

## Panel A additional maker 1 name IMPC_IMM_260_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 1 clone IMPC_IMM_261_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 1 fluorochrome IMPC_IMM_262_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 1 RRID IMPC_IMM_263_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

## Panel A additional maker 2 name IMPC_IMM_264_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 2 clone IMPC_IMM_265_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 2 fluorochrome IMPC_IMM_266_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 2 RRID IMPC_IMM_267_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional maker 3 name IMPC_IMM_268_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 3 clone IMPC_IMM_269_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 3 fluorochrome IMPC_IMM_270_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 3 RRID IMPC_IMM_271_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional maker 4 name IMPC_IMM_272_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 4 clone IMPC_IMM_273_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 4 fluorochrome IMPC_IMM_274_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 4 RRID IMPC_IMM_275_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional maker 5 name IMPC_IMM_276_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 5 clone IMPC_IMM_277_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 5 fluorochrome IMPC_IMM_278_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel A additional marker 5 RRID IMPC_IMM_279_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD5 clone IMPC_IMM_280_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD5 fluorochrome IMPC_IMM_281_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD5 RRID IMPC_IMM_282_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-Ly6G clone IMPC_IMM_283_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-Ly6G fluorochrome IMPC_IMM_284_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BV421, BV785,

---

## Panel B anti-Ly6G RRID IMPC_IMM_285_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_2737756, AB_2566317,

---

## Panel B anti-CD19 clone IMPC_IMM_286_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD19 fluorochrome IMPC_IMM_287_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** BV510, PE-Cy7,

---

## Panel B anti-CD19 RRID IMPC_IMM_288_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_2737915, AB_394495,

---

## Panel B anti-Ly6C clone IMPC_IMM_289_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AL-21, HK1.4,

---

## Panel B anti-Ly6c fluorochrome IMPC_IMM_290_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** FITC, PerCP Cy5.5,

---

## Panel B anti-Ly6c RRID IMPC_IMM_291_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_394628, AB_2723343,

---

## Panel B anti-CD21/35 clone IMPC_IMM_292_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD21/35 fluorochrome IMPC_IMM_293_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE, BV605,

---

## Panel B anti-CD21/35 RRID IMPC_IMM_294_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_394532, AB_2738048,

---

## Panel B anti-CD11b clone IMPC_IMM_295_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD11b fluorochrome IMPC_IMM_296_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE-CF594, PerCP-Cy5.5,

---

## Panel B anti-CD11b RRID IMPC_IMM_297_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_11154216, AB_2033995,

---

## Panel B anti-CD11c clone IMPC_IMM_298_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD11c fluorochrome IMPC_IMM_299_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PE-Cy7, APC-Cy7,

---

## Panel B anti-CD11c RRID IMPC_IMM_300_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_647251, AB_10611727,

---

## Panel B anti-CD161 clone IMPC_IMM_301_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-CD161 fluorochrome IMPC_IMM_302_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

## Panel B anti-CD161 RRID IMPC_IMM_303_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-MHCII clone IMPC_IMM_304_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B anti-MHCII fluorochrome IMPC_IMM_305_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** APC-eFluor(R) 780, BV650, APC-Cy7,

---

## Panel B anti-MHCII RRID IMPC_IMM_306_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** AB_1548783, AB_2565975, AB_2069377,

---

## Panel B Live/Dead stain IMPC_IMM_307_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Options:** PI, Aqua, Sytox Blue,

---

## Panel B additional maker 1 name IMPC_IMM_308_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 1 clone IMPC_IMM_309_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 1 fluorochrome IMPC_IMM_310_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 1 RRID IMPC_IMM_311_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional maker 2 name IMPC_IMM_312_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 2 clone IMPC_IMM_313_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 2 fluorochrome IMPC_IMM_314_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 2 RRID IMPC_IMM_315_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional maker 3 name IMPC_IMM_316_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 3 clone IMPC_IMM_317_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

---

## Panel B additional marker 3 fluorochrome IMPC_IMM_318_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

## Panel B additional marker 3 RRID IMPC_IMM_319_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional maker 4 name IMPC_IMM_320_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 4 clone IMPC_IMM_321_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 4 fluorochrome IMPC_IMM_322_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 4 RRID IMPC_IMM_323_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional maker 5 name IMPC_IMM_324_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 5 clone IMPC_IMM_325_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 5 fluorochrome IMPC_IMM_326_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Panel B additional marker 5 RRID IMPC_IMM_327_001 | v1.0

procedureMetadata

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

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## Analysis results file IMPC_IMM_328_001 | v1.0

mediaParameter

**Req. Analysis:** false **Req. Upload:** false **Is Annotated:** false

**Description:** A csv file with the analysis results for the mutant line

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