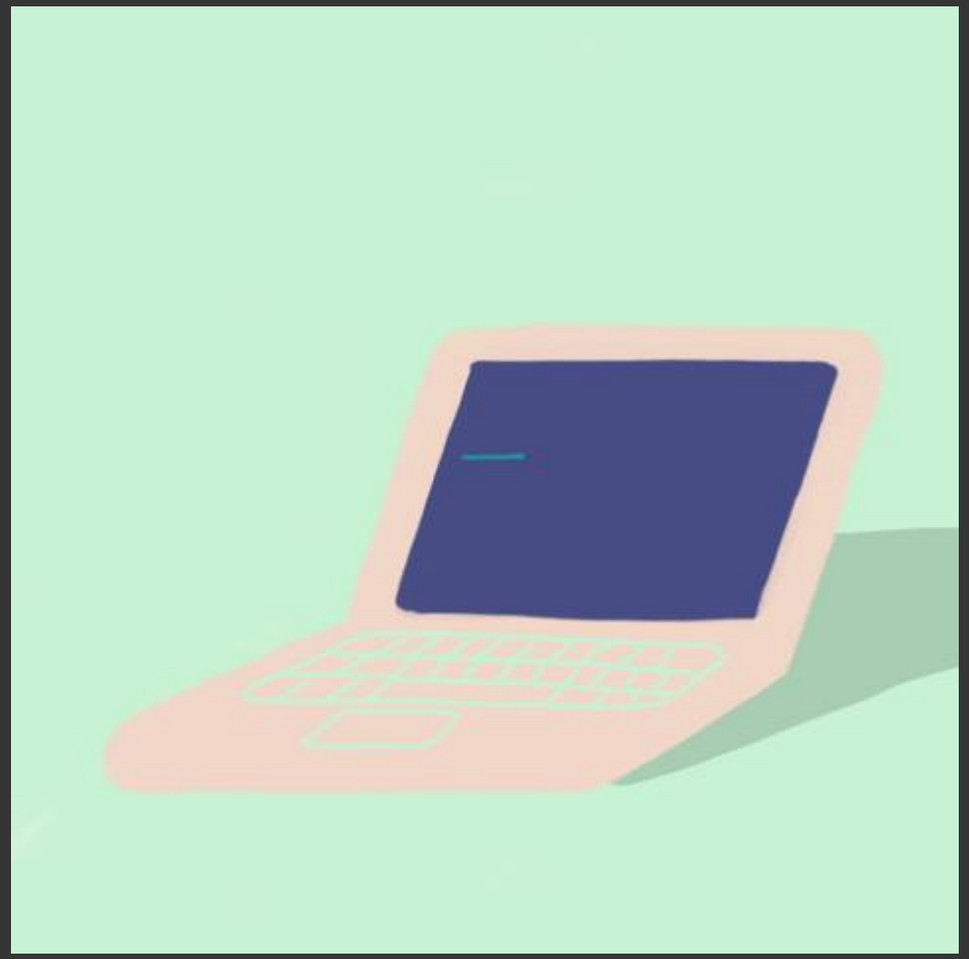
Microsoft

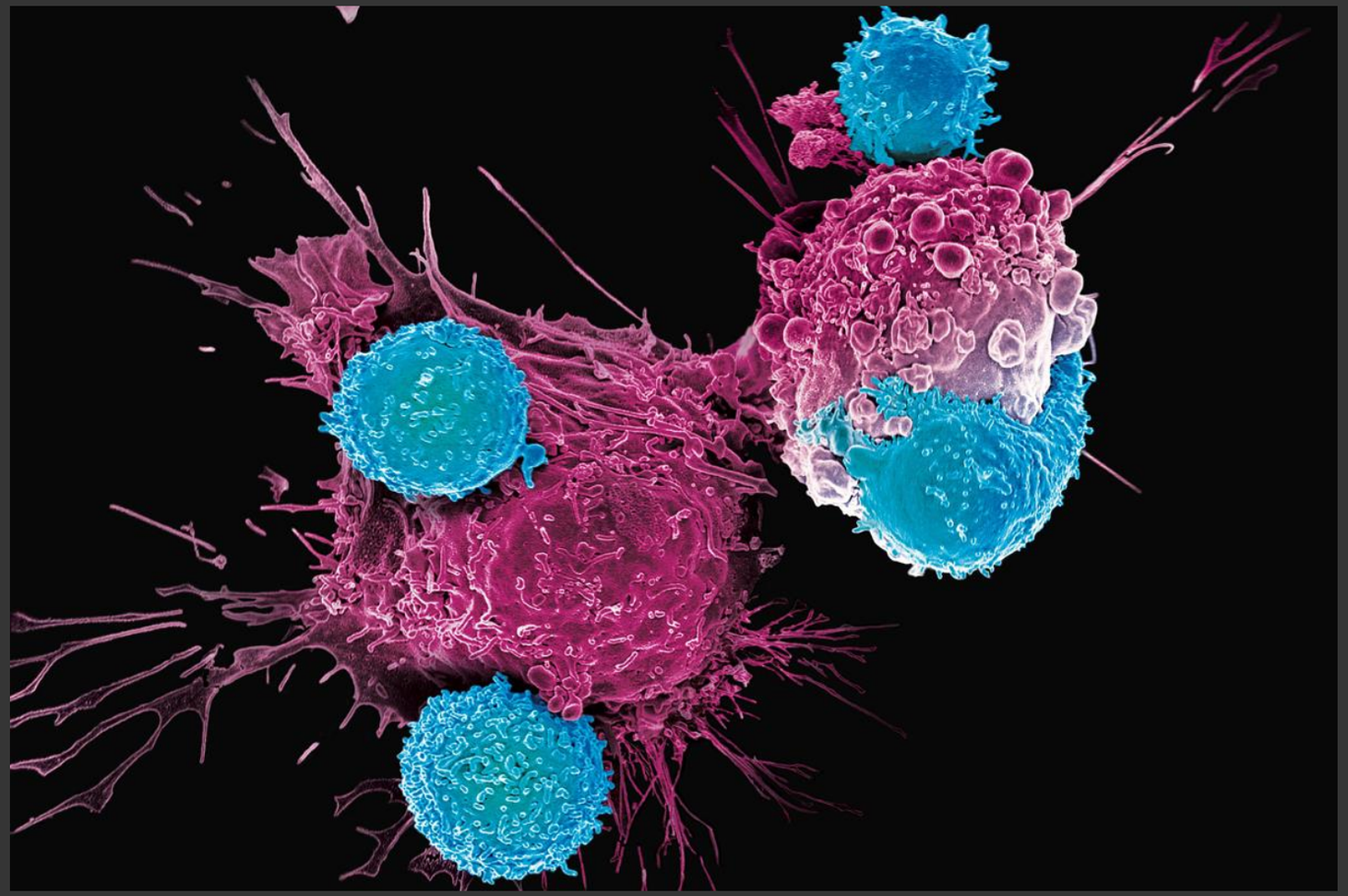
Document Like a Scientist

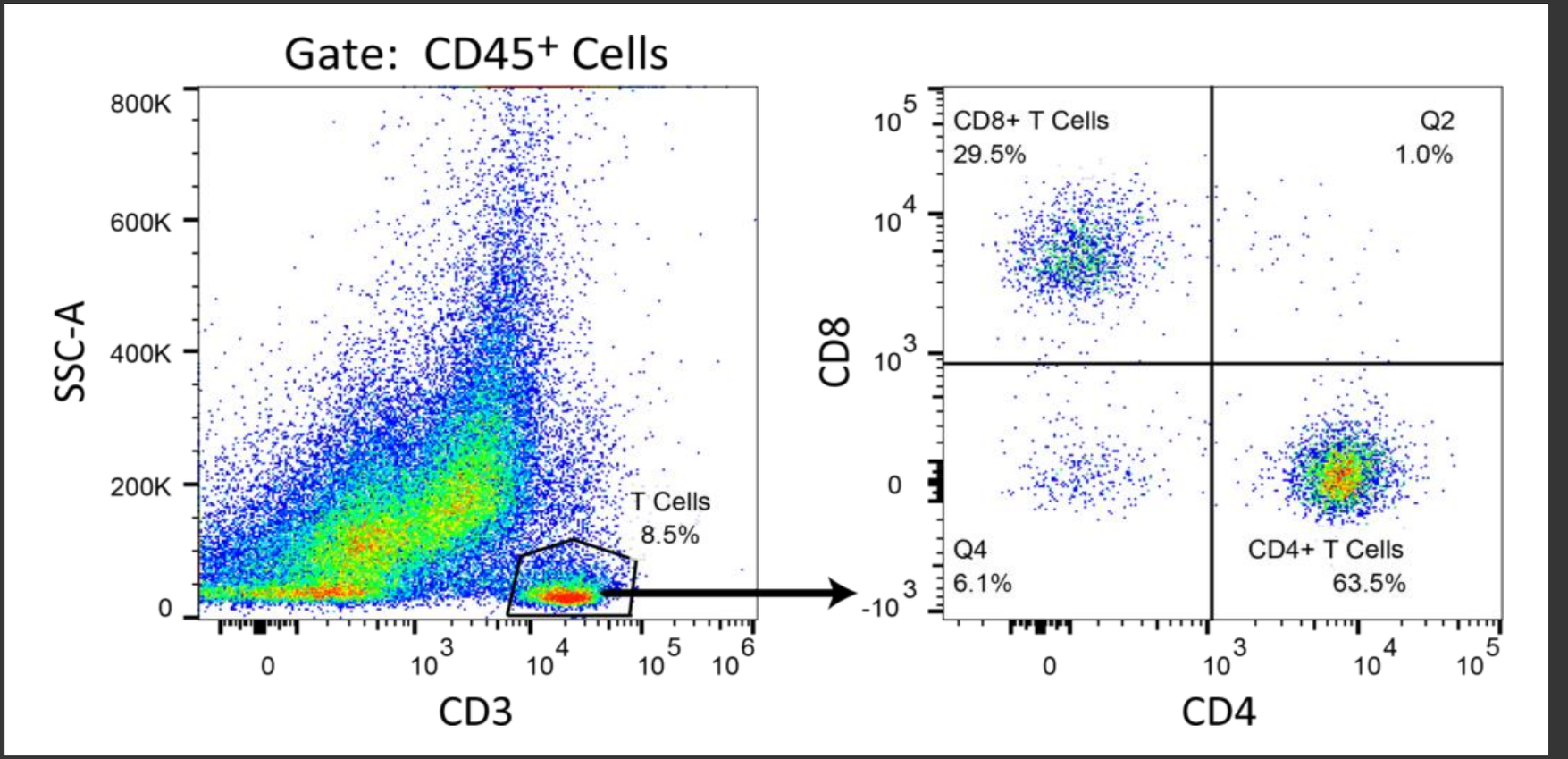
Karissa Peth
Sr. Program Manager, Cloud Advocacy



1

Wow….
I miss
scientific documentation




Gate: CD45+ Cells
SSC-A
800K
600K
400K
200K
0
CD3
0
10^3
10^4
10^5
10^6
T Cells
8.5%
CD8
10^5
10^4
10^3
0
-10^3
CD8+ T Cells
29.5%
Q2
1.0%
Q4
6.1%
CD4+ T Cells
63.5%
CD4

How is cancer research related to tech documentation?

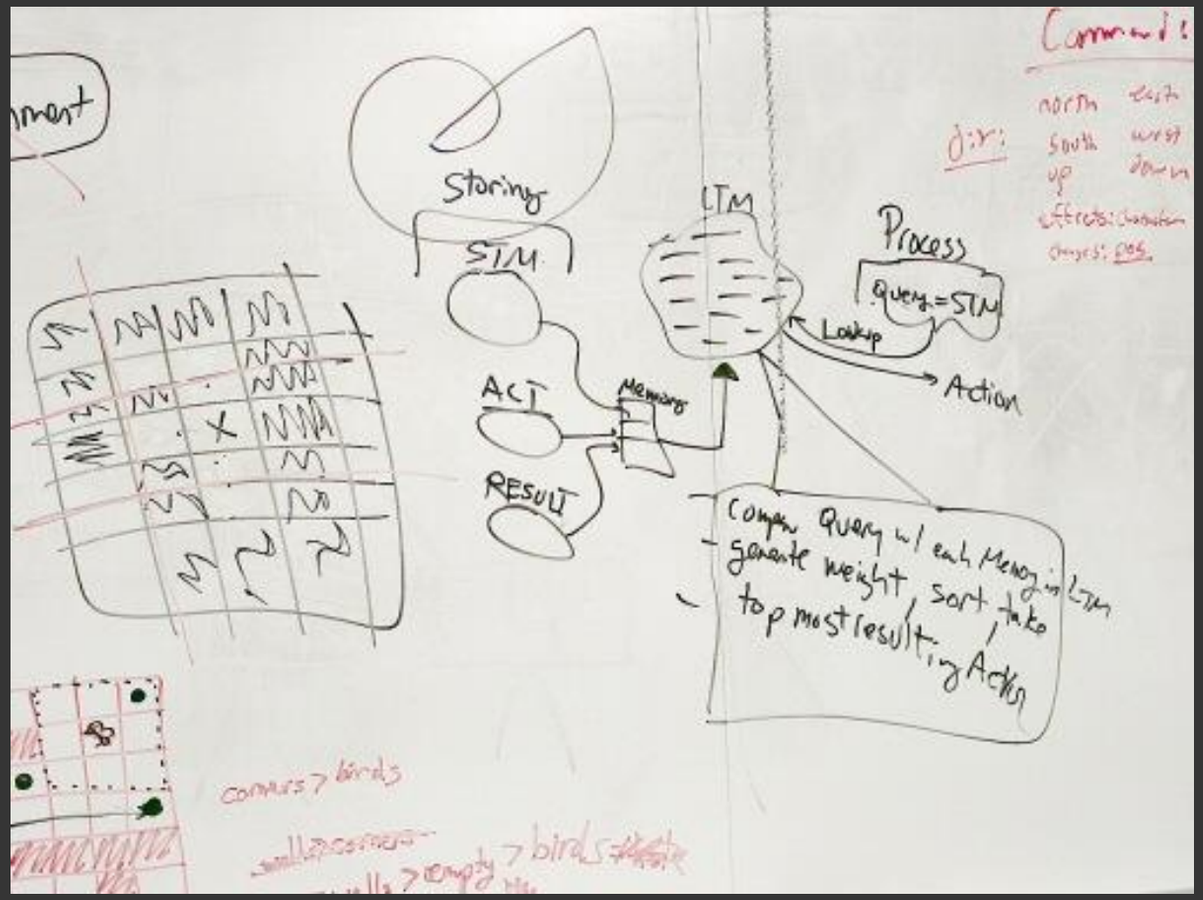
Current Projects

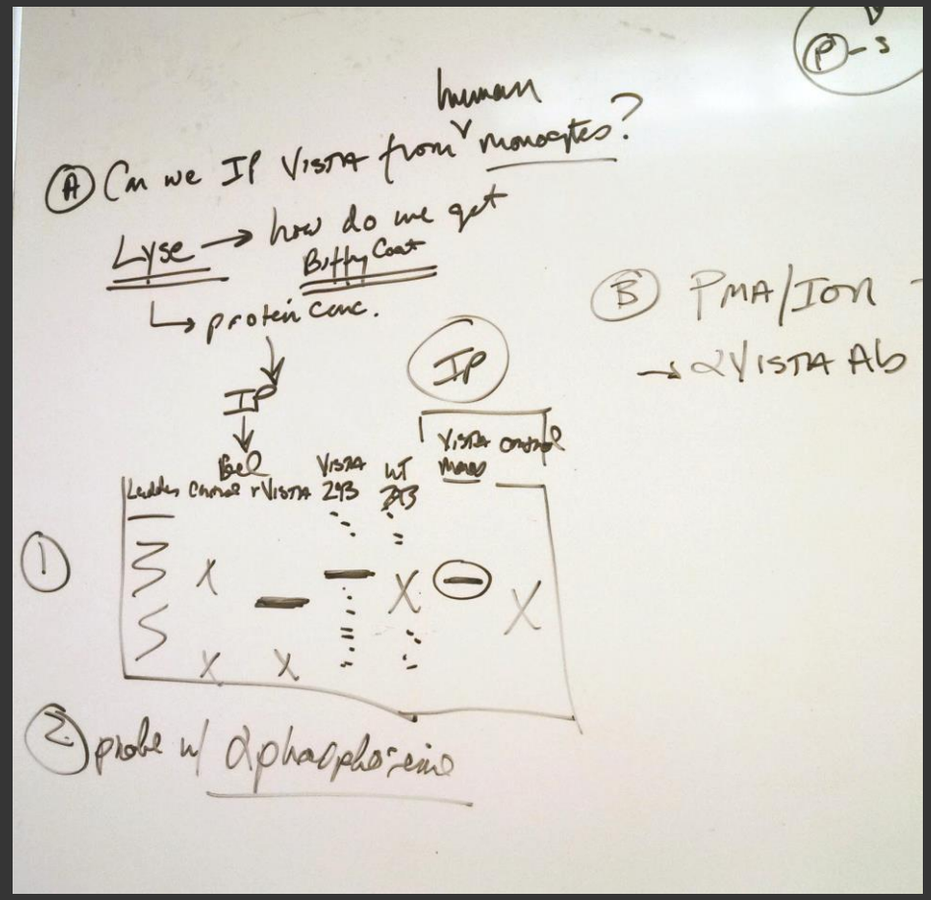
Priority	Description	Time-frame
	Luciferase Viral Prep	
	Viral Titer from mCherry/Luc Virus Prep	
	Prep Incubators	
	Chemical Inventory for Lab	*Ongoing*
	Cryo Storage Inventory (w/ Megan)	*Ongoing*
	Cell Check Authentication of 253J-B-V and 253J-B-V-luc2 LAPC4 & LAPC4-Luc	*Growing LAPC4 lines; Need to send into IDEX-RADIL*
	Luciferase Refolding Assay	

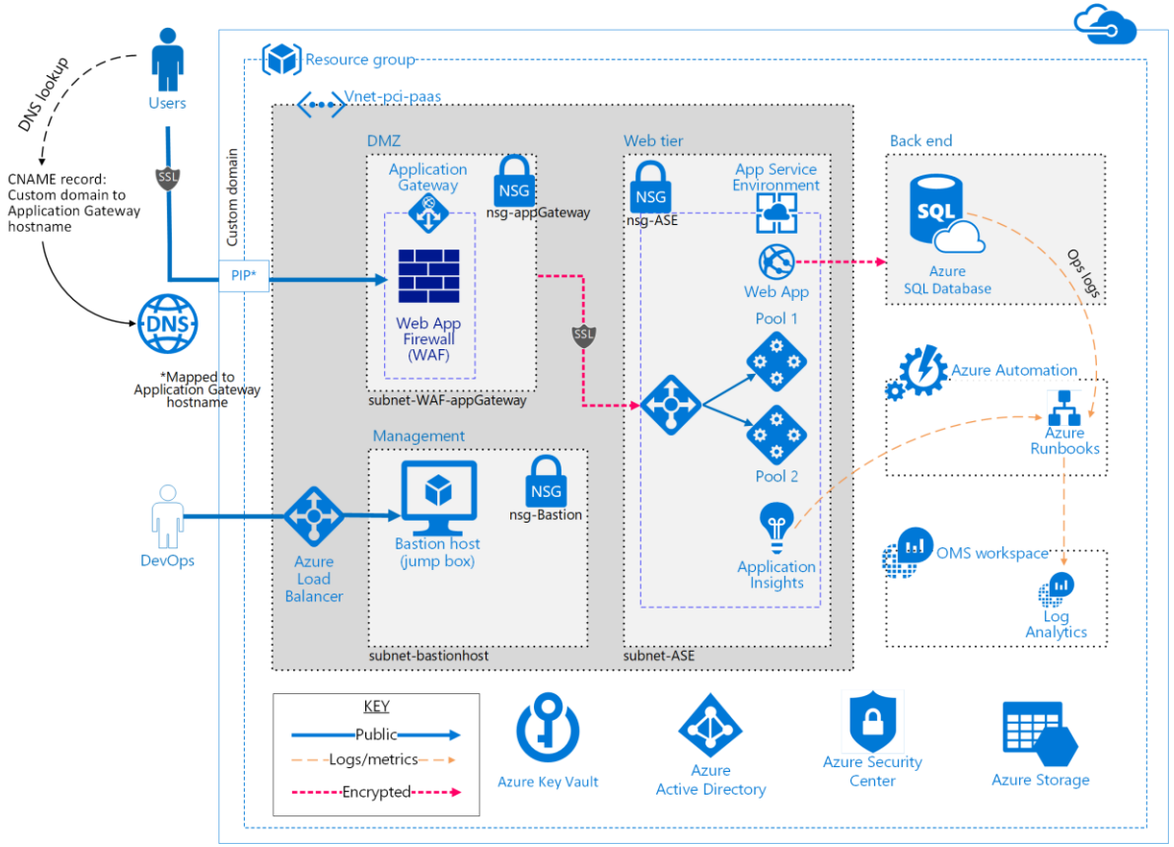
Upcoming Projects

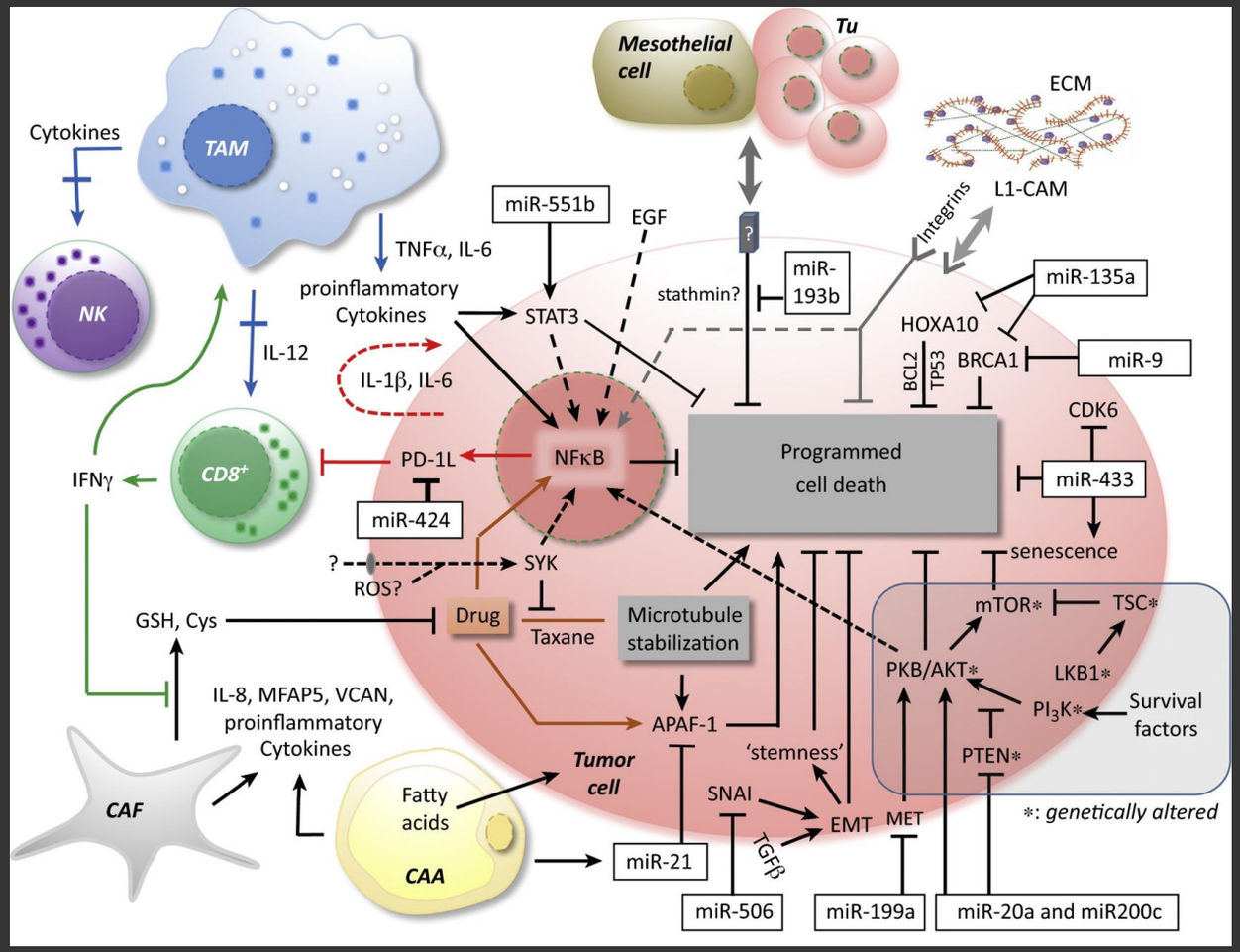
#	Description	Planned Start	Study Director
1923.27	Metastatic Lung (A549-Luc via TV)		Iman
1923.28	Prostate Model Development & Training (PC3-mm2-Luc via OT & TV)	2/6/13	Nikhil
1923.29	Prostate Model Development & Training (LAPC4-Luc via OT & TV)		
1923.30	Bladder Model Development & Training (253J-BV-Luc via OT & TV)		Karissa
2067.F	Vitamin D deficiency		Nikhil

ID	Work Item Type	Title	State
350	User Story	Enhance the form used for Submitting a New Position, and retrieve...	Active
407	User Story	Provide a mechanism to bulk onboard [redacted] admins (pilot)	Closed
454	User Story	Build out committee entities and fields, along with adding related Cont...	Active
484	User Story	Plan reports required for [redacted]	Active
485	User Story	Plan security controls for [redacted]	Active
595	Bug	Validate that [redacted], once logged in, only have ac...	Closed
735	User Story	As an IT staff member, I want to have a place to collaborate with my pe...	New
746	User Story	Add and test webparts to the prod environment	Resolved
750	User Story	Create a KB article to document the process of updating regional [redacted]...	Active
751	User Story	Identify and plan committee workflows	Active
752	User Story	Committee migration planning	Active
754	User Story	Plan and build out [redacted] entities and fields in Dynamics 365	Active
755	User Story	Plan a SharePoint site for storing [redacted] documents, and workflows to...	New
756	User Story	Identify with Core Team a list of sites, forms and artifacts to localize	New
757	User Story	Provide strings for translation to Core team	New


Storing
STM
LTM
Process
Query=STM
Lookup
Action
ACT
Memory
RESULT
Commands:
compare Query w/ each Memory in LTM
generate weight, sort, take
top most resulting Action
corners > birds

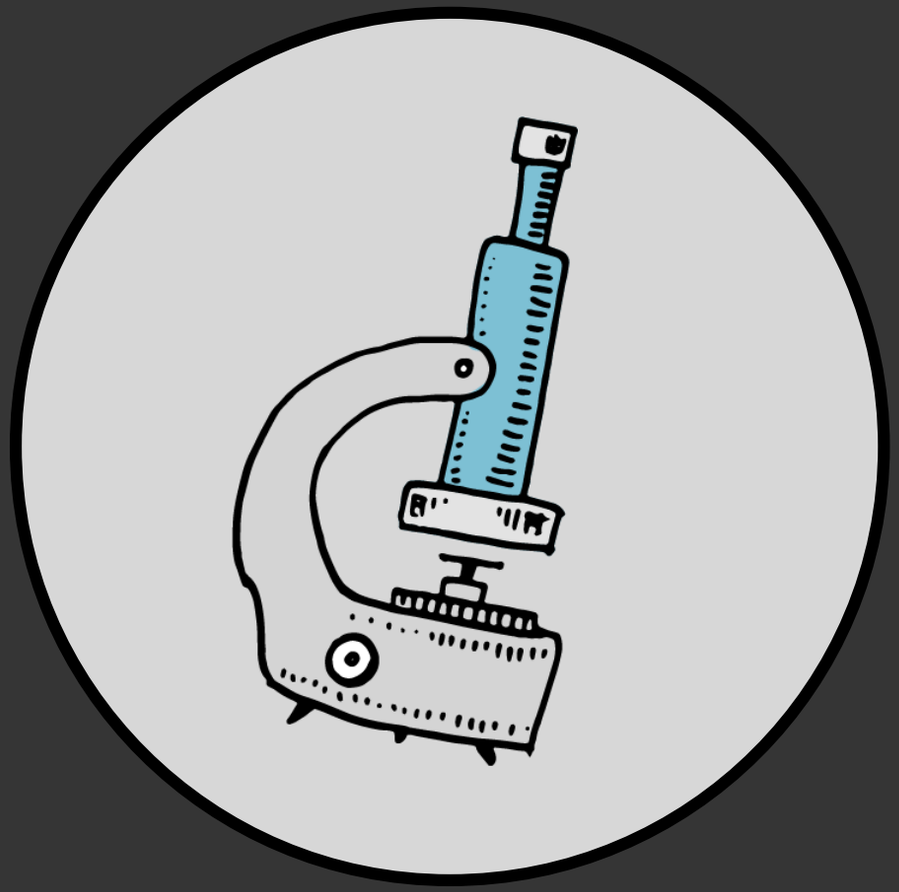

human
A Can we IP Vista from monocytes?
Lyse → how do we get
Buffy Coat
↳ protein conc.
IP
IP
Vista control
Beads
Leader
rVista
Vista 293
WT 293
1
2 probe w/ alphaphosphine
B PMA/ION
→ 2 Vista Abs

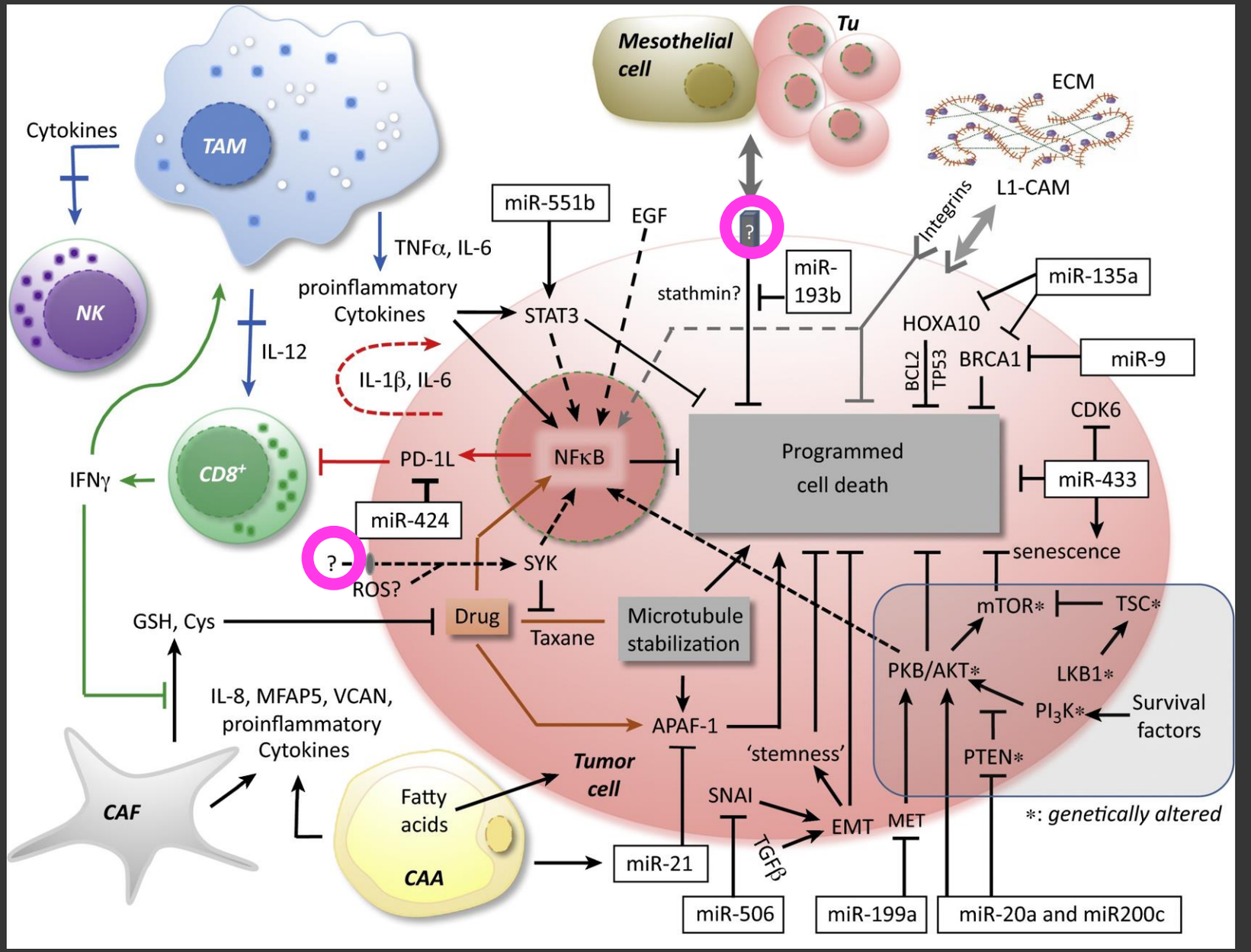

DNS lookup
Users
CNAME record: Custom domain to Application Gateway hostname
SSL
DNS
*Mapped to Application Gateway hostname
Resource group
Vnet-pci-paas
Custom domain
PIP*
DMZ
Application Gateway
NSG
nsg-appGateway
Web App Firewall (WAF)
subnet-WAF-appGateway
Web tier
NSG
nsg-ASE
App Service Environment
Web App
Pool 1
Pool 2
Application Insights
subnet-ASE
Back end
SQL
Azure SQL Database
Ops logs
Azure Automation
Azure Runbooks
OMS workspace
Log Analytics
Management
NSG
nsg-Bastion
Bastion host (jump box)
subnet-bastionhost
DevOps
Azure Load Balancer
KEY
Public
Logs/metrics
Encrypted
Azure Key Vault
Azure Active Directory
Azure Security Center
Azure Storage

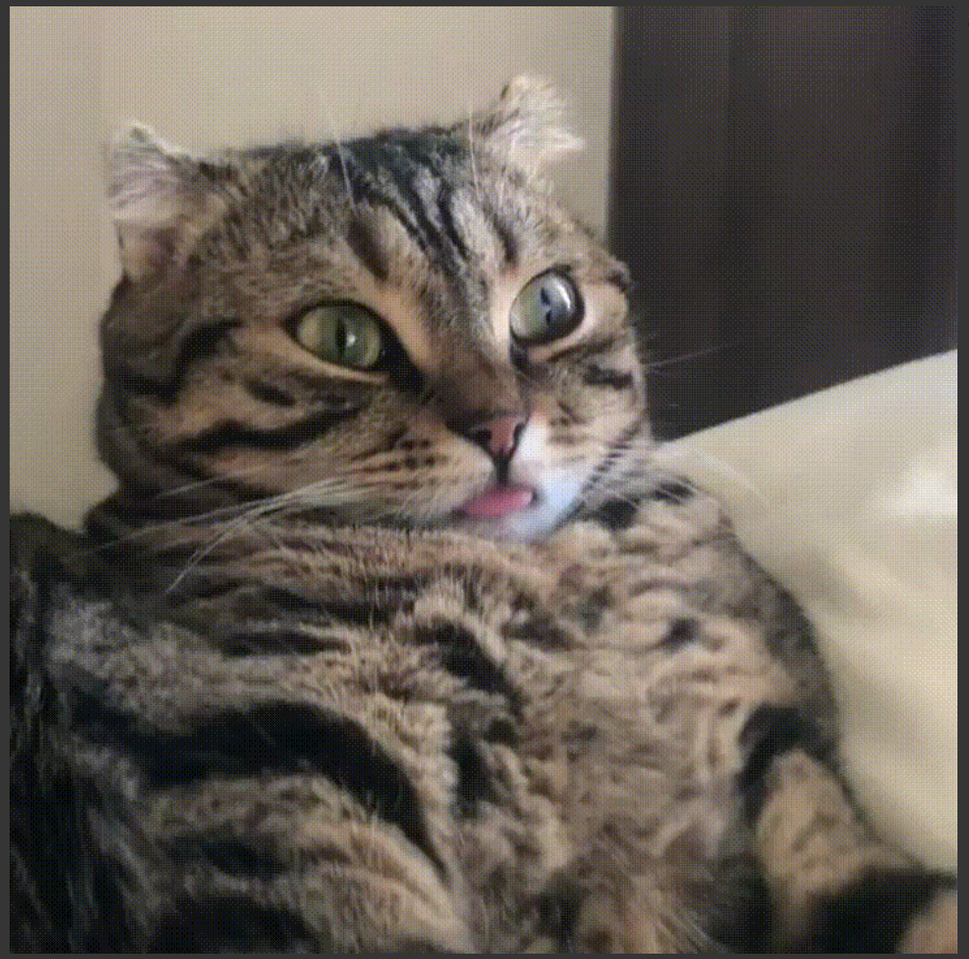

Cytokines
TAM
Mesothelial cell
Tu
ECM
L1-CAM
Integrins
miR-551b
EGF
TNFα, IL-6
proinflammatory Cytokines
stathmin?
miR-193b
miR-135a
HOXA10
BCL2
TP53
BRCA1
miR-9
CDK6
miR-433
senescence
NK
IL-12
IL-1β, IL-6
STAT3
NFκB
Programmed cell death
IFNγ
CD8+
PD-1L
miR-424
?
ROS?
SYK
GSH, Cys
Drug
Taxane
Microtubule stabilization
mTOR*
TSC*
LKB1*
PKB/AKT*
PI3K*
Survival factors
PTEN*
IL-8, MFAP5, VCAN, proinflammatory Cytokines
APAF-1
'stemness'
Tumor cell
CAF
Fatty acids
CAA
SNAI
EMT
MET
TGFβ
miR-21
miR-506
miR-199a
miR-20a and miR200c
*: genetically altered

Wow….
I miss
scientific documentation

Scientific Method




Mesothelial cell
Tu
ECM
L1-CAM
Integrins
Cytokines
TAM
NK
TNFα, IL-6
proinflammatory Cytokines
IL-12
IL-1β, IL-6
IFNγ
CD8+
miR-551b
EGF
?
stathmin?
miR-193b
STAT3
NFκB
PD-1L
miR-424
Programmed cell death
HOXA10
miR-135a
BCL2
TP53
BRCA1
miR-9
CDK6
miR-433
senescence
?
ROS?
SYK
Drug
Taxane
GSH, Cys
Microtubule stabilization
mTOR*
TSC*
LKB1*
PKB/AKT*
PI3K*
Survival factors
PTEN*
APAF-1
'stemness'
IL-8, MFAP5, VCAN, proinflammatory Cytokines
CAF
Tumor cell
Fatty acids
CAA
SNAI
EMT
MET
TGFβ
miR-21
miR-506
miR-199a
miR-20a and miR200c
*: genetically altered



8

Problem Statement

Smaller Steps

Find Tools

Execute

Confirm Output

Problem Statement:

Determine the receptor(s) for the VISTA protein

Smaller Steps:

1. Determine if VISTA protein binds certain types of cells
2. Interrogate the differences between those cell types
3. Run experiments to narrow down short list
4. Run experiments to confirm receptor identity
5. File patent & submit manuscript
6. Screen develop anti-VISTA-R antibodies
7. Confirm efficacy in cancer treatment

The first step to passing peer review

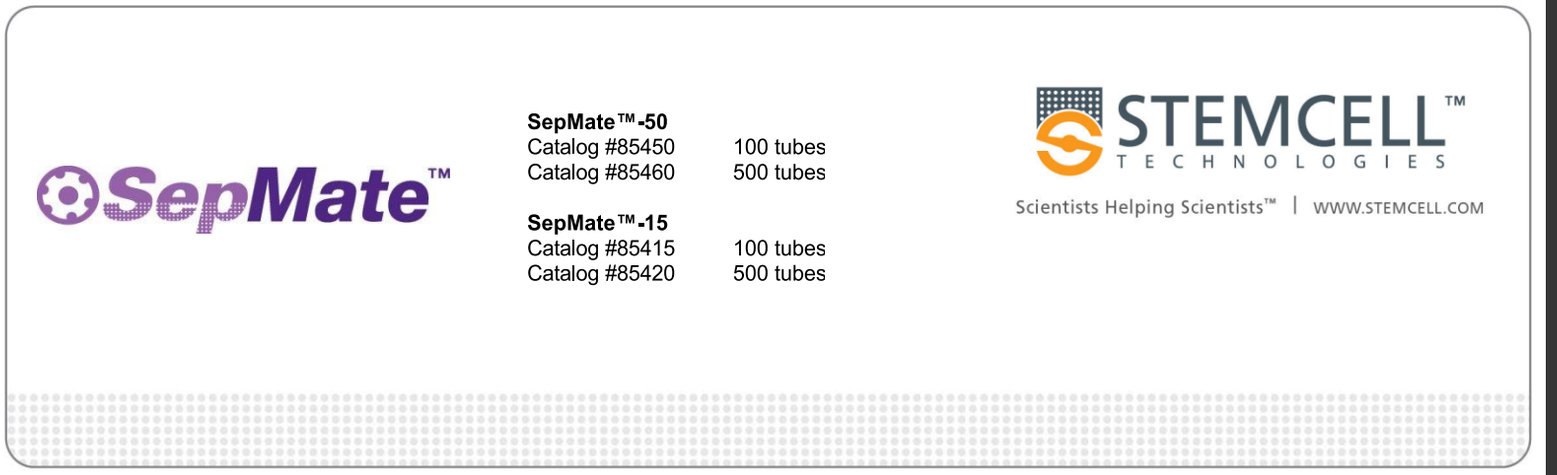
Copy and Pasting from Data Sheets

Science all the things

O RLY?

Not E. Holmes

a Data what?



Intended Use

SepMate™ is used to isolate mononuclear cells (MNCs, comprising lymphocytes and monocytes) from whole blood or bone marrow by density centrifugation.

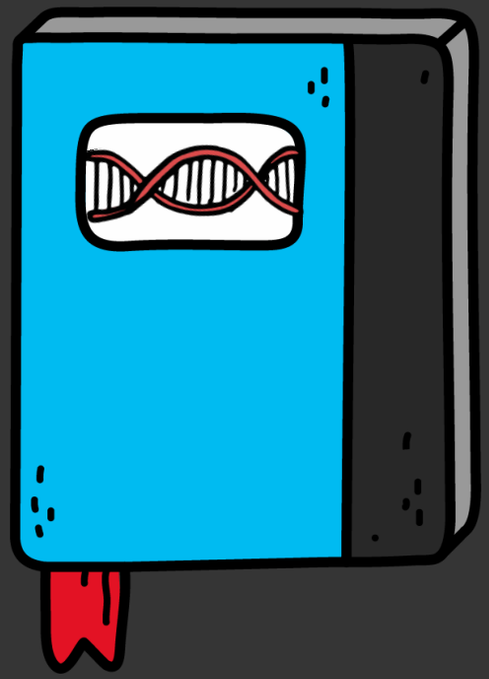
For in vitro diagnostic use.

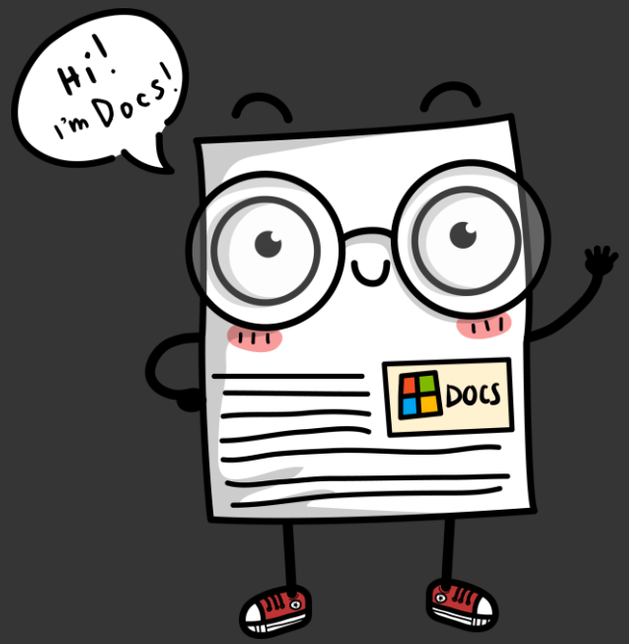
Product Description

MNCs are commonly isolated by density centrifugation. With this method, defibrinated or anticoagulant-treated blood is carefully layered on a density gradient medium and centrifuged for a short period of time. Differential migration during centrifugation results in the formation of layers containing different cell types. The bottom layer contains erythrocytes which have been aggregated by the density gradient medium and therefore sediment completely through the density gradient medium. The layer immediately above the erythrocyte layer contains mostly granulocytes, which at the osmotic pressure of the density gradient medium solution attain a density great enough to migrate through the density gradient medium layer. Because of their lower density, the MNCs are found at the interface between the plasma and the density gradient medium with other slowly sedimenting particles (platelets). The MNCs are carefully recovered from the interface and washed.

The specialized insert in SepMate™ minimizes mixing of the sample and the density gradient medium, thereby avoiding the need for careful layering and careful cell removal from the interface. Density gradient medium is pipetted through a central hole in the insert, partially filling the tube. Whole blood is then rapidly pipetted down the side of the tube to rest upon the density gradient medium. After centrifugation for 10 minutes with the brake on, the enriched cell layer is simply poured off into a new tube, while the density gradient medium, erythrocytes, and granulocytes are retained below the insert. The MNCs are washed and are then ready for use.

Data Sheet = Vendor Docs




Hi!
I'm Docs!
DOCS

Directions for Use

Ensure that sample, recommended medium (PBS + 2% FBS), density gradient medium (see Special Materials Required But Not Provided), and centrifuge are all at room temperature (15 - 25°C).

1. Add density gradient medium to the SepMate™ tube by carefully pipetting it through the central hole of the SepMate™ insert. Refer to Table 1 for required volumes. The top of the density gradient medium will be above the insert.

   NOTE: Small bubbles may be present in the density gradient medium after pipetting. These bubbles will not affect performance.

2. Dilute sample with an equal volume of PBS + 2% FBS. Mix gently.

   For example, dilute 5 mL of sample with 5 mL of PBS + 2% FBS.

3. Keeping the SepMate™ tube vertical, add the diluted sample by pipetting it down the side of the tube. The sample will mix with the density gradient medium above the insert.

   NOTE: The sample can be poured down the side of the tube. Take care not to pour the diluted sample directly through the central hole.

4. Centrifuge at **1200 x g** (see Notes) for **10 minutes** at room temperature, with the **brake on**.

   NOTE: For samples older than 24 hours, a centrifugation time of 20 minutes is recommended.

5. Pour off the top layer, which contains the enriched MNCs, into a new tube. Do not hold the SepMate™ tube in the inverted position for longer than 2 seconds.

   NOTE: Some red blood cells (RBCs) may be present on the surface of the SepMate™ insert after centrifugation. These RBCs will not affect performance.

   NOTE: To reduce platelet contamination in the enriched MNCs, pipette off some of the supernatant above the MNC layer before pouring.

6. Wash enriched MNCs with PBS + 2% FBS. Repeat wash.

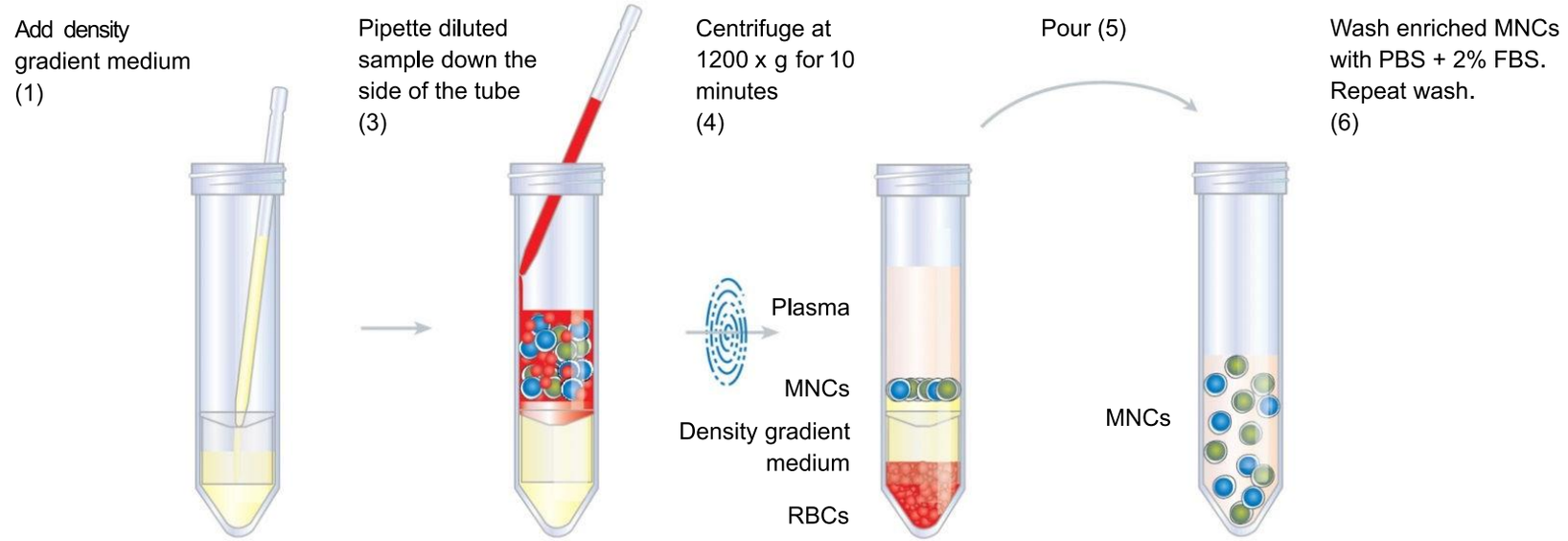
   NOTE: Centrifuging at 300 x g for 8 minutes at room temperature, with the brake on, is recommended.

   NOTE: To remove platelets from the enriched MNCs, perform one of the washes at 120 x g for 10 minutes at room temperature, with the brake off.

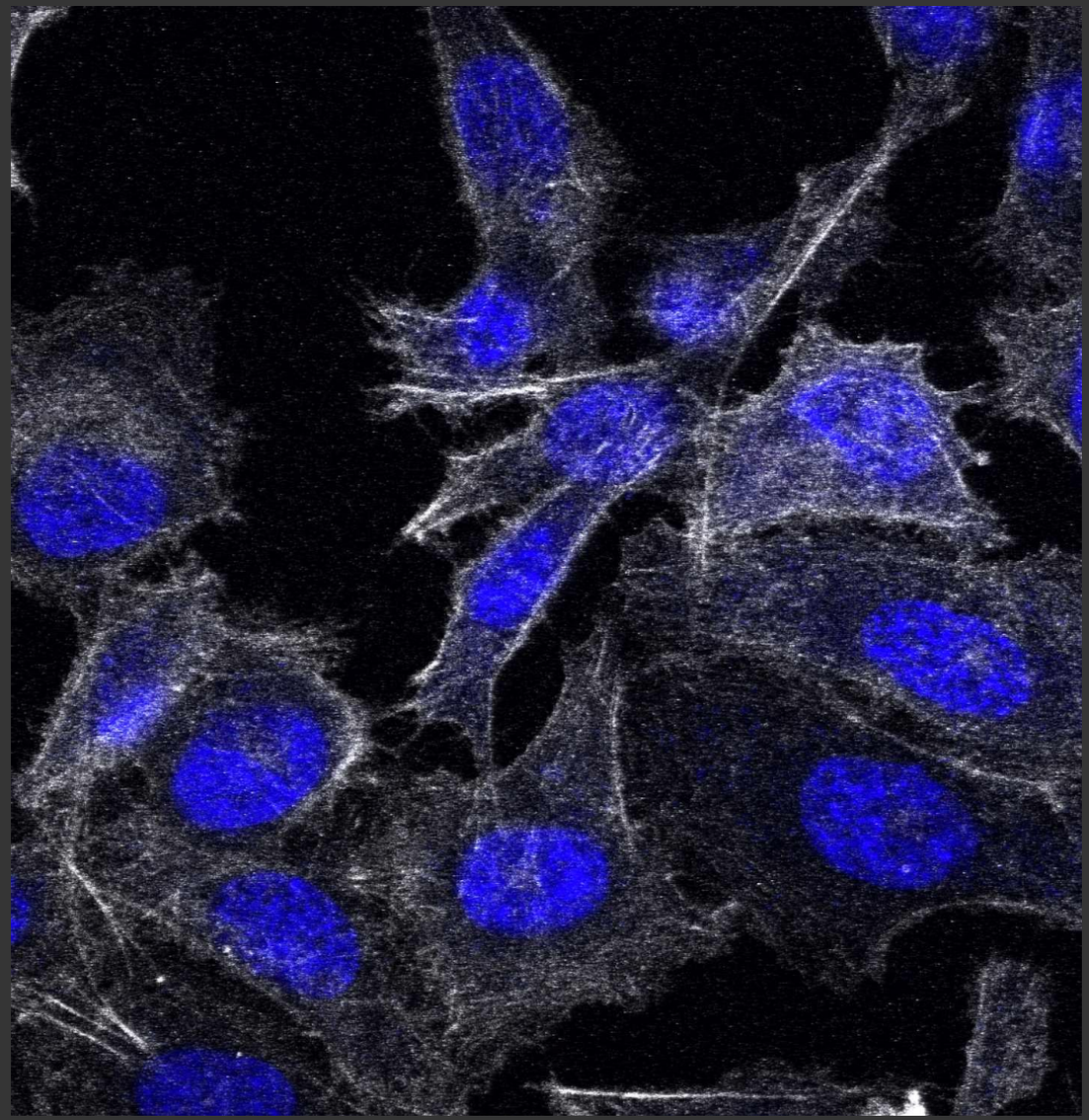
   NOTE: If the density gradient medium above the SepMate™ insert appears red after centrifugation (i.e. some RBCs have not pelleted), the SepMate™ tube can be spun at 1200 x g for another 10 minutes with the brake on. This step may be necessary when processing samples that are older than 24 hours.

SepMate™ Procedure

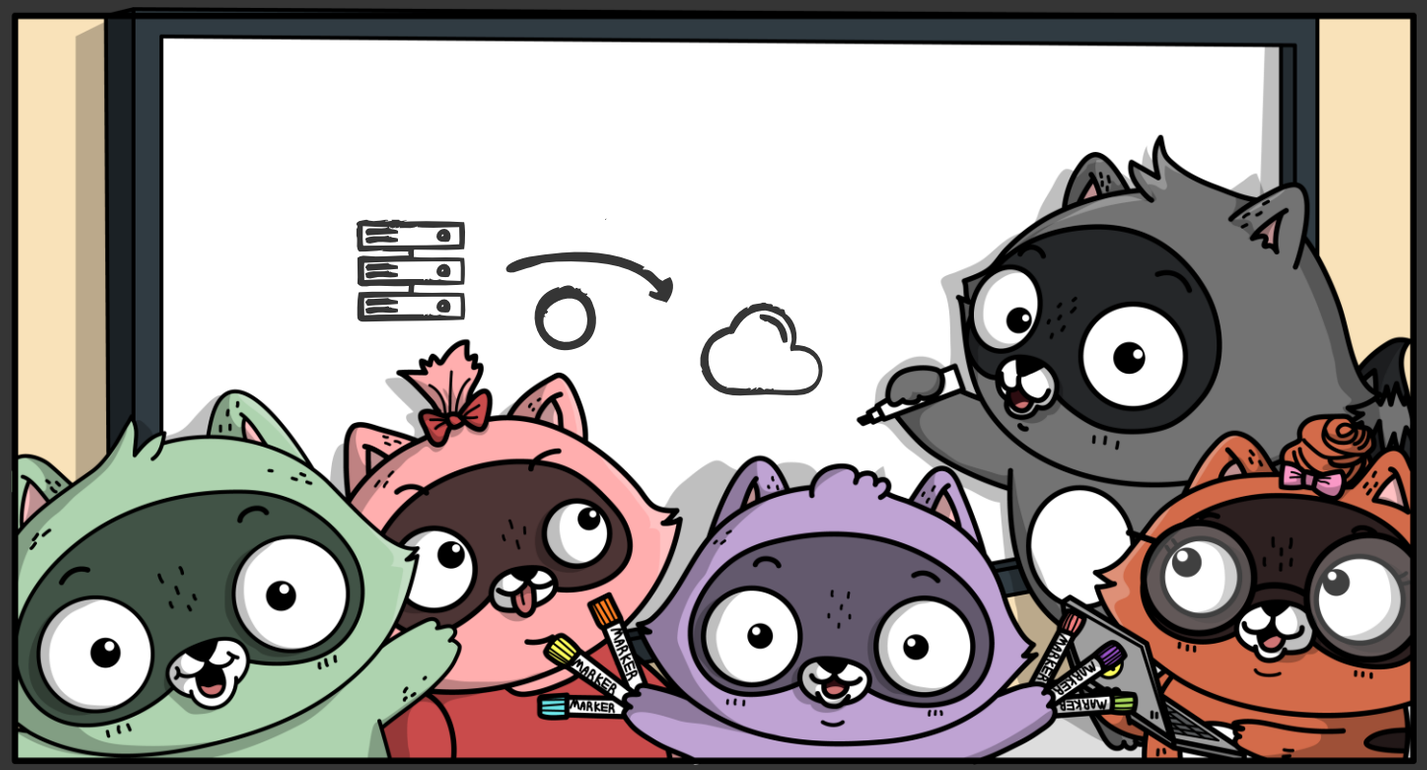
Numbers in brackets refer to steps under Directions for Use.



Great documentation shifts your concentration from how to why



Materials List
(aka Prerequisites)



MATERIALS

PBMC cultivation

- RPMI 1640 medium
- 100´ L-Glutamine stock solution (200 mM)
- Human AB Serum
- 24-well plate (e.g. Gas-permeable Culture Plate, # 150-000-362)

▲ Note: With the Gas-permeable Culture Plate (# 150-000-362), up to 2.5´107 PBMCs/well/mL can be stimulated as opposed to 1´107 PBMCs/well/mL in standard 24-well plates.

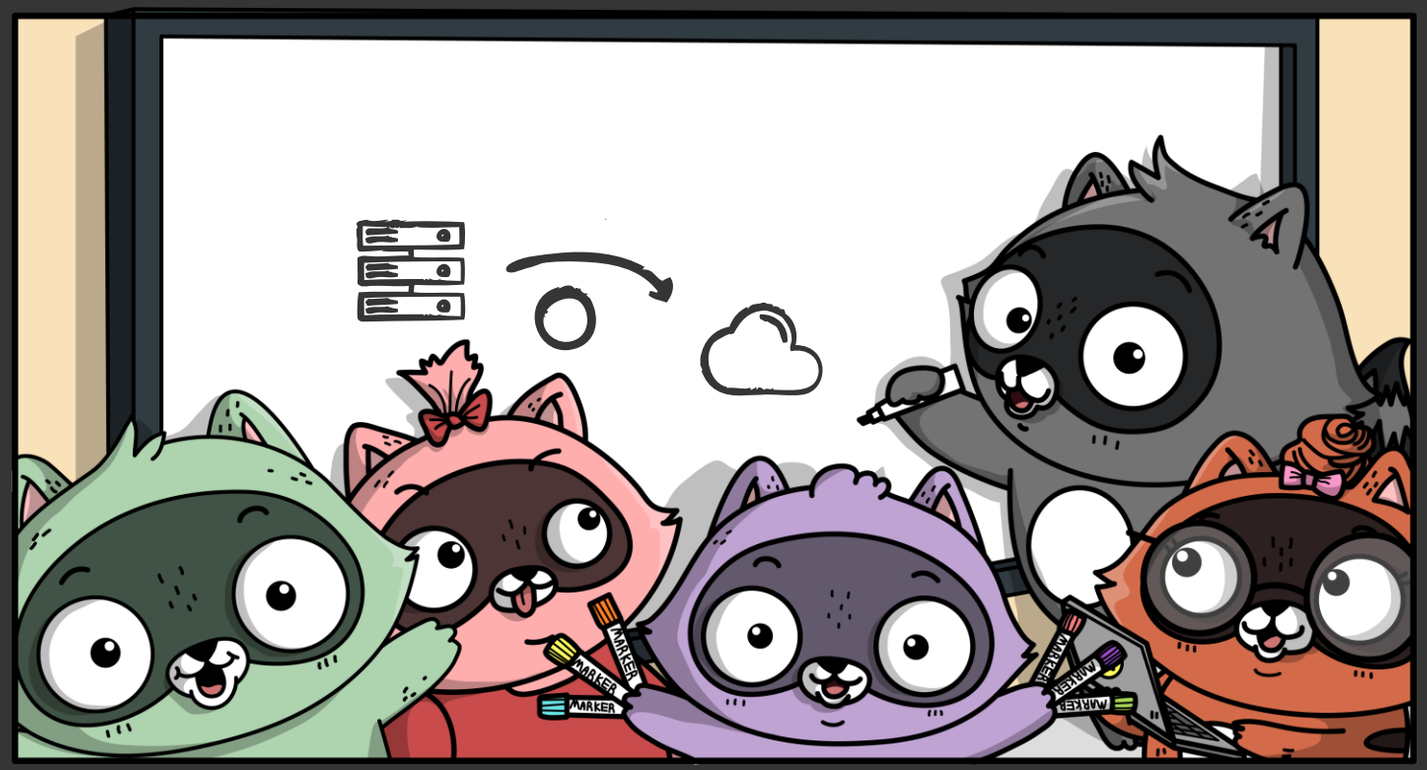
PREREQUISITES

The following prerequisites are required for a successful and properly secured use of Helm.

1. A Kubernetes cluster
2. Deciding what security configurations to apply to your installation, if any
3. Installing and configuring Helm and Tiller, the cluster-side service.

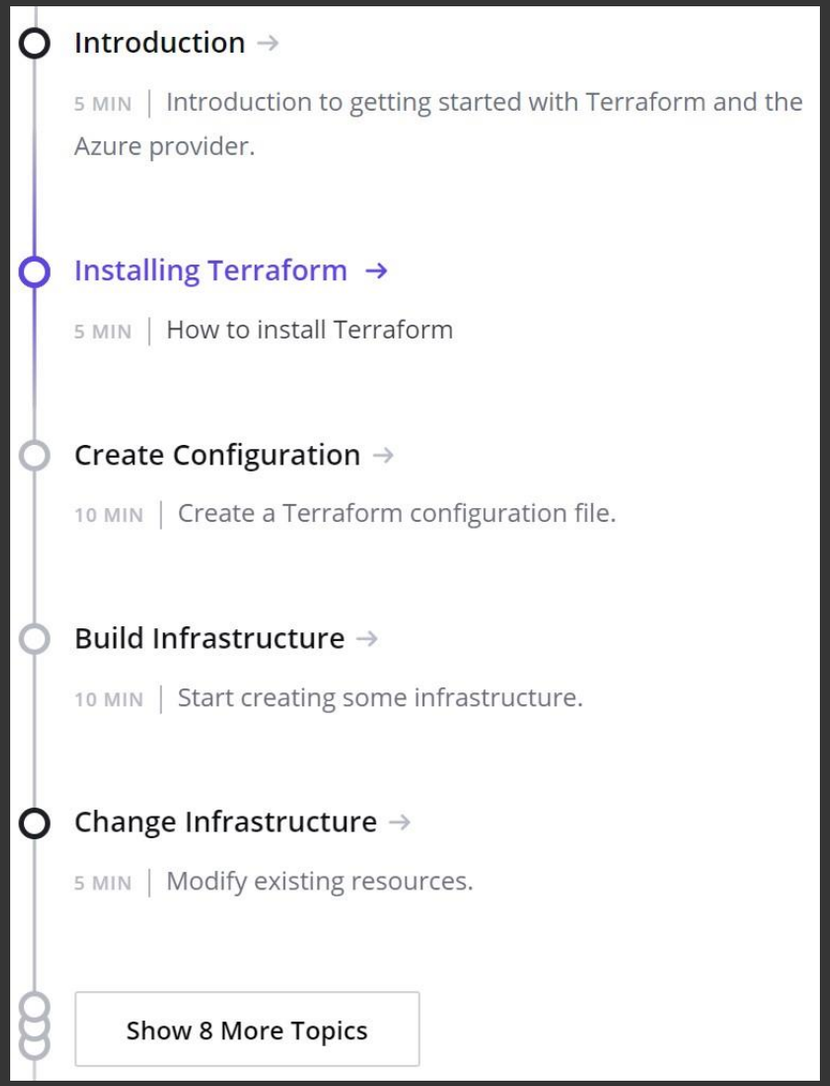
Material Lists are the homework assignments for your docs.

Diagrams



Workflow

6 h	PBMC stimulation
40 min	Magnetic and immune-fluorescent surface labeling
60 min	Magnetic enrichment and intracellular staining
	Flow cytometry analysis


Introduction →
5 MIN | Introduction to getting started with Terraform and the Azure provider.
Installing Terraform →
5 MIN | How to install Terraform
Create Configuration →
10 MIN | Create a Terraform configuration file.
Build Infrastructure →
10 MIN | Start creating some infrastructure.
Change Infrastructure →
5 MIN | Modify existing resources.
Show 8 More Topics

Diagrams increase the accessibility of your docs.

Dates

miltenyibiotec.com

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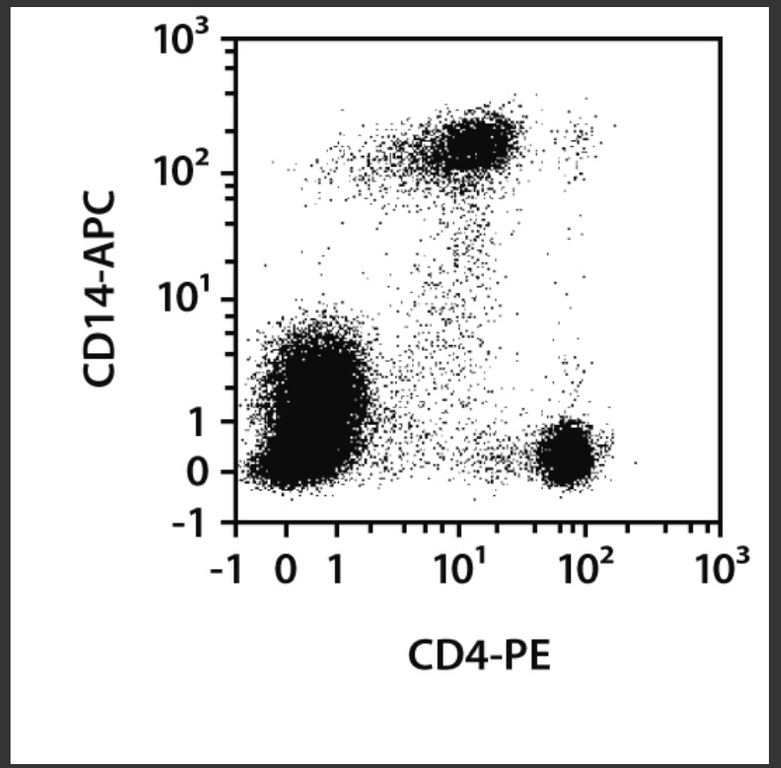
Create and configure an Azure Kubernetes Services (AKS) cluster to use virtual nodes using the Azure CLI

05/05/2019 • 9 minutes to read • +5

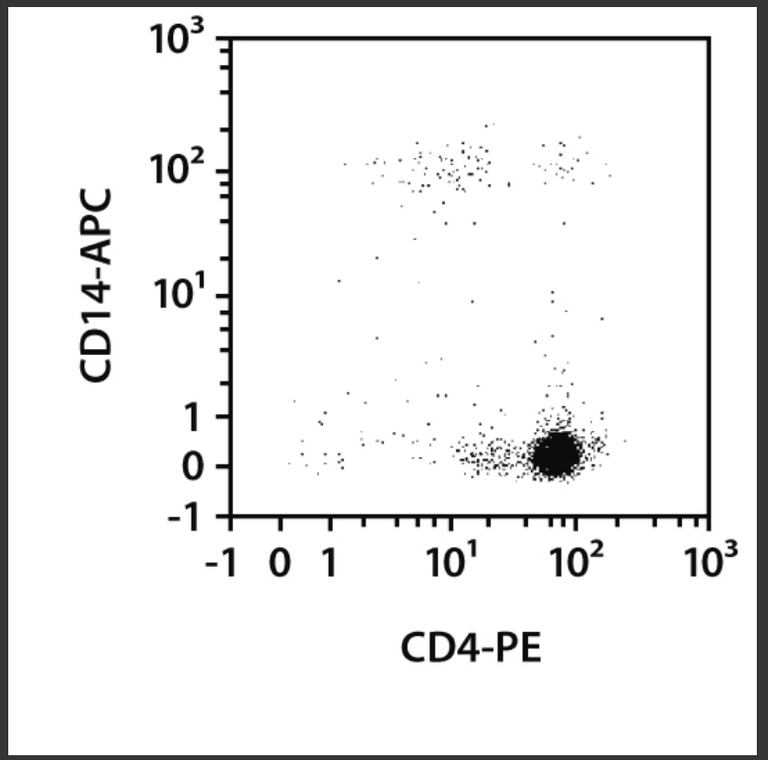
To rapidly scale application workloads in an Azure Kubernetes Service (AKS) cluster, you can use virtual nodes. With virtual nodes, you have quick provisioning of pods, and only pay per second for their execution time. You don't need to wait for Kubernetes cluster autoscaler to deploy VM compute nodes to run the additional pods. Virtual nodes are only supported with Linux pods and nodes.

Dates are a hint to users to expect differences between docs and real life.

Positive Controls
(aka Confirmations)

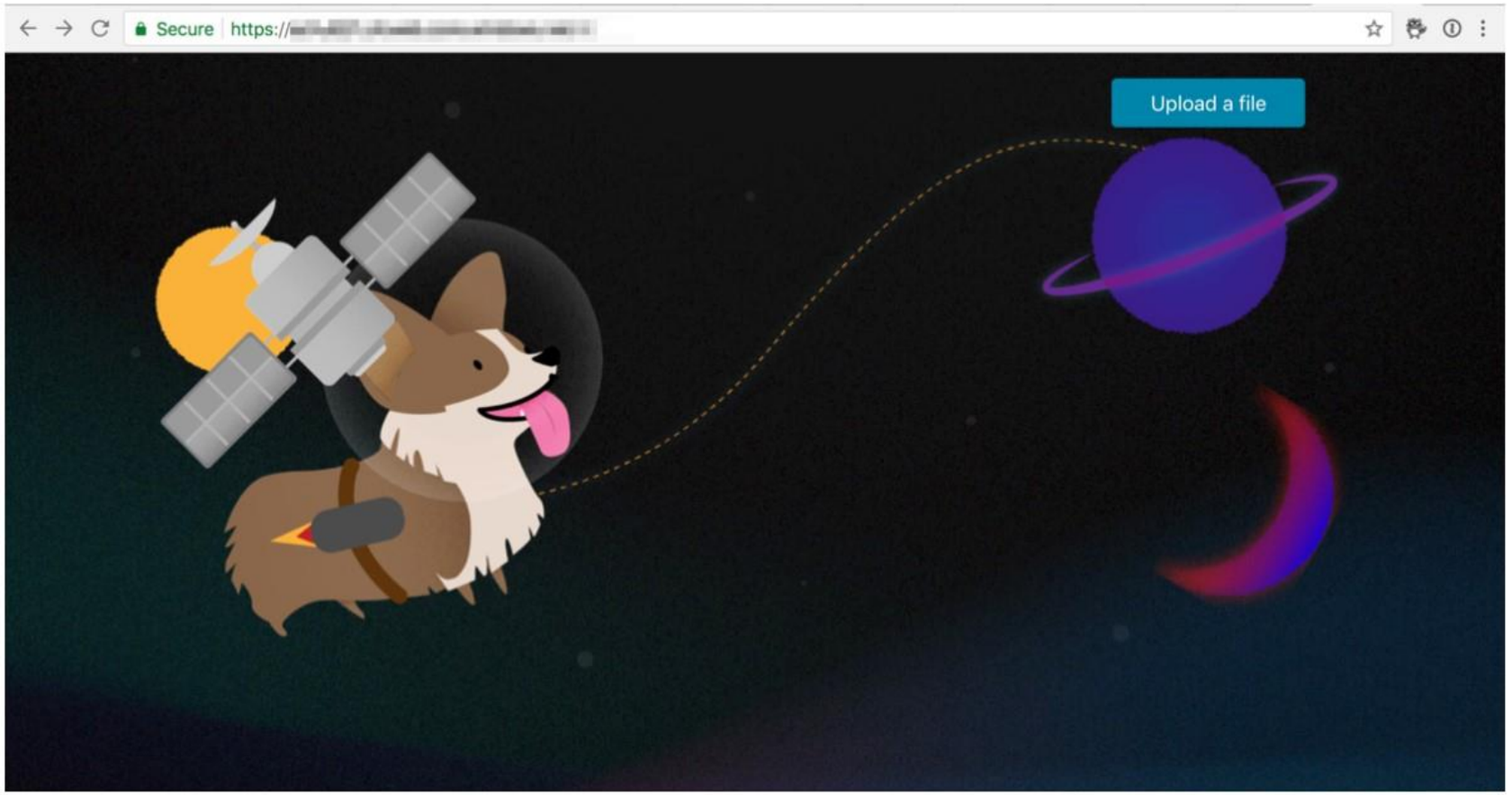


Before



After

4. Open the Storage static websites primary endpoint URL in a web browser to view the application.



Positive controls tell users they are heading the right way.

Rationale
(aka Uses)

Introduction

Due to the very low frequency of ag-specific T cells in peripheral blood the reliable detection, enumeration and phenotypical characterization require the processing of high cell numbers and highly specific analysis methods.

....

Combining magnetic cell enrichment and multiparameter flow cytometry analysis of CD154+ CD4+ T cells allow direct ex vivo detection and characterization of rare ag-specific T cells.

When to use them

Heatmaps look best when you have a lot of events to visualize, and where the spread of values is wide enough to see some differentiation, but not complete noise.

Any column representing a duration or size is a perfect fit, but any column you might run a percentile or average calculation on may benefit from being rendered as a heatmap as well.

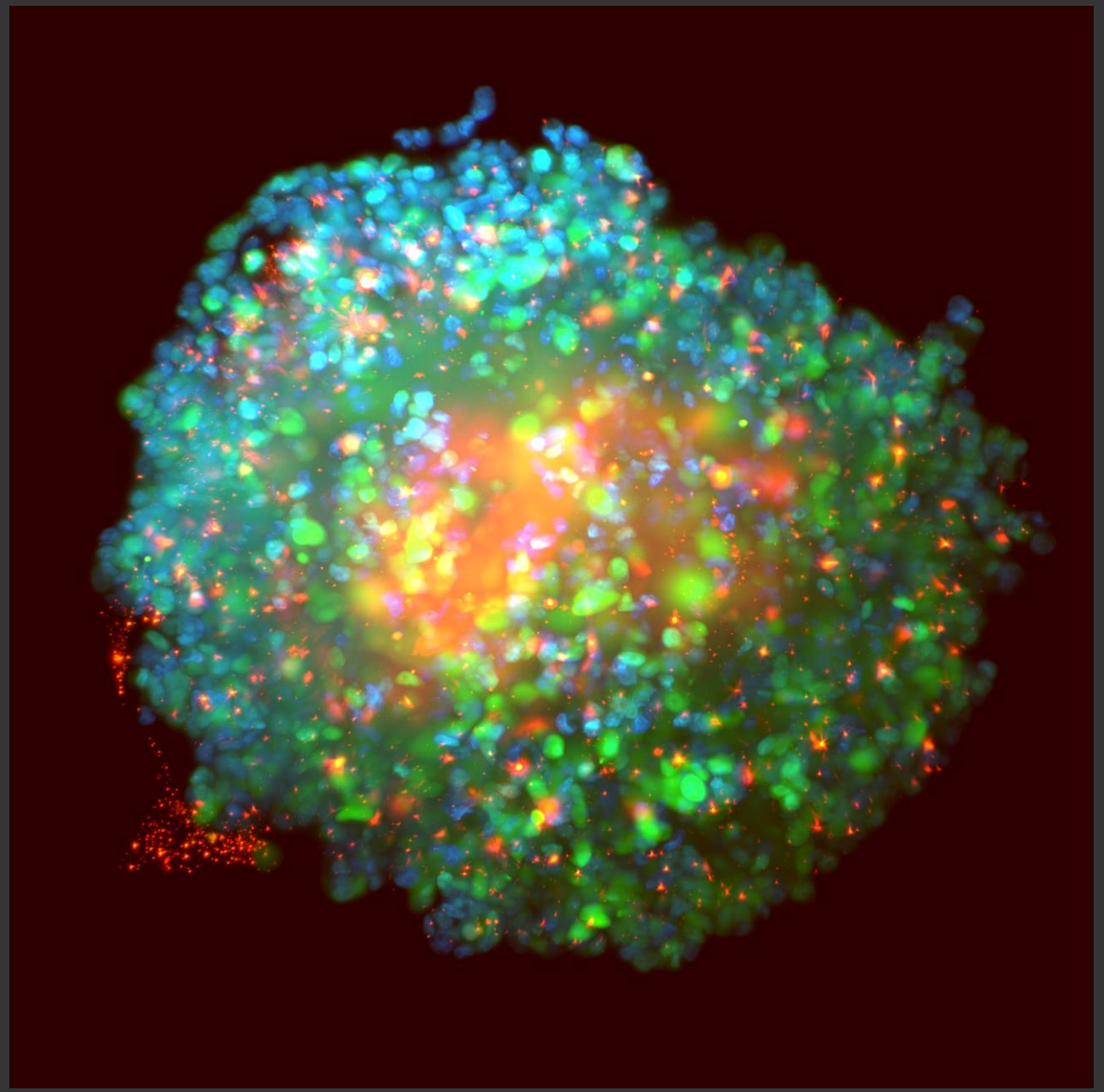
Rationale in your docs creates lasting impact.

Wow….
I miss
scientific documentation

Often missing from Docs

1. Materials List
2. Diagrams
3. Dates
4. Positive Controls
5. Rationale/Uses

Great documentation shifts your concentration from how to why



Microsoft

Acknowledgments

Jeremy Meiss @IAmJerdog
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Nitya Narasimhan @nitya
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Seth Juarez @sethjuarez
Chloe Condon @ChloeCondon
Aysegul Yonet @AysSomething
Tori Wieldt @ToriWieldt

Kelly McMichael @kellyshalk
Prashant Sridharan @CoolAssPuppy

Dr. Byron Hann
Dr. Mark Merchant
Dr. Warren Fiskus
Dr. Kapil Bhalla
Dr. Andy Rankin

Document Like a Scientist

Karissa Peth
@karissapeth

References

1. Image: https://giphy.com/gifs/computer-gif-artist-code-fedryX7dMGMe6lgqDm via Giphy
2. Image: Prasad Adusumilli, https://www.mskcc.org/car-cell-therapy via Memorial Sloan Kettering Cancer Center
3. Christopher J. Nirschl, and Charles G. Drake Clin Cancer Res 2013;19:4917-4924
4. Image: https://www.mibioresearch.com/services/flow-cytometry/ from Mi Bioresearch
5. Image: https://stackoverflow.blog/2010/12/17/introducing-programmers-stackexchange-com/ from Stack Overflow blog
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13. Text: https://helm.sh/docs/using_helm/#prerequisites from Helm
14. Diagram: https://learn.hashicorp.com/terraform?track=azure#azure from HashiCorp
15. Image: https://docs.microsoft.com/en-us/azure/functions/tutorial-static-website-serverless-api-with-database-old from Microsoft Docs
16. Images: https://www.miltenyibiotec.com/US-en/resources/macs-handbook/human-cells-and-organs/human-cell-types/cd4-t-cells-human.html from MiltenyiBiotec
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18. Text: https://docs.honeycomb.io/working-with-your-data/heatmaps/#when-to-use-them from Honeycomb docs
19. Image: https://docs.microsoft.com/en-us/azure/functions/tutorial-static-website-serverless-api-with-database-old?tutorial-step=1 from Microsoft docs
20. Image: https://commons.wikimedia.org/wiki/File:PC3_prostate_cancer_cells,_confocal_image,_63x.jpg via Wikimedia Commons
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