

Mark Sundrud, PhD

Associate Professor

Department of Immunology and Microbiology

Cracking the code of chronic inflammation

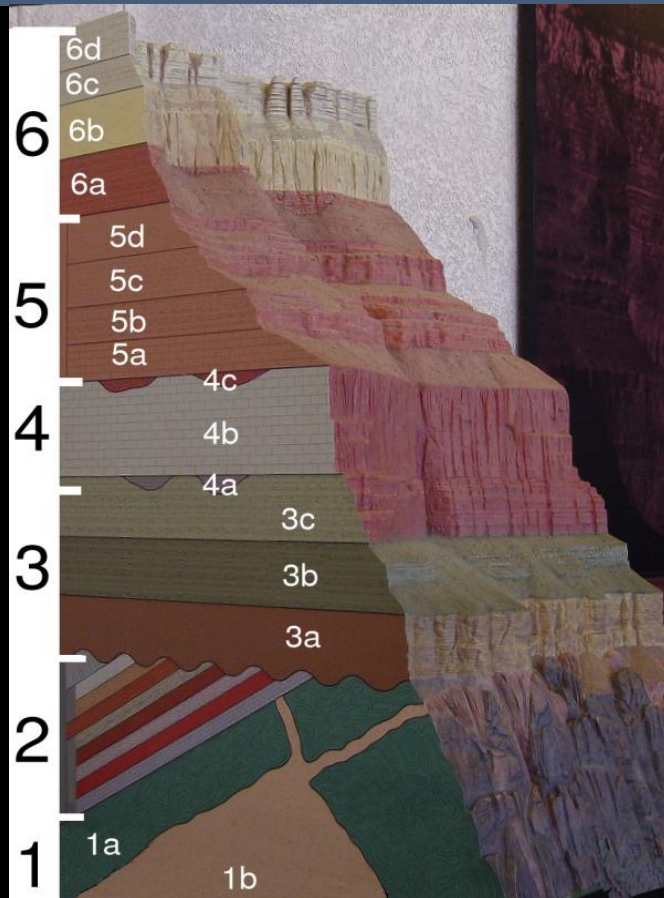


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Increase knowledge

Help people



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The Sundrud lab



The Sundrud Lab @
Scripps FL

<https://sundrudlab.com>

Mission

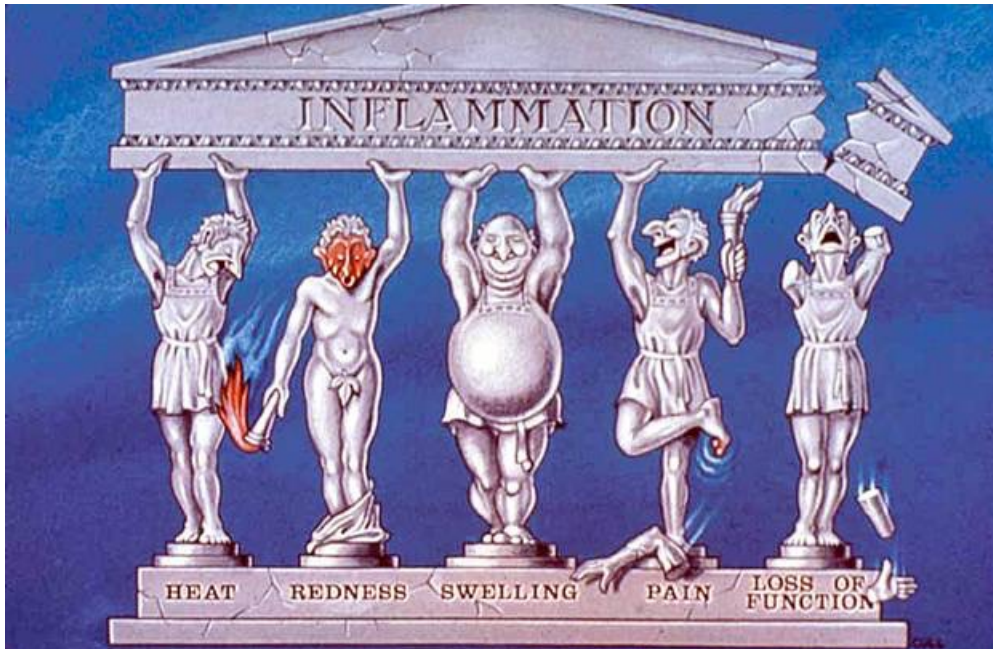
Define mechanisms that cause chronic inflammation (**increase knowledge**) to design safer and more effective therapies (**help people**)



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What is Inflammation?

Celsus tetrad of inflammation
(literally meaning “to set on fire”)
- a.k.a., the 5 cardinal signs of inflammation



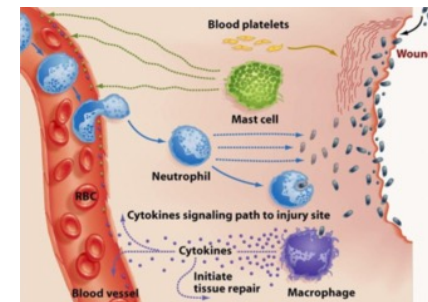
<https://www.healthcoach7.com/2015/02/26/dna-carrying-inflammation/>

In today's language:

Immune-mediated response
to damaged or infected tissue



http://dermaamin.com/site/images/clinical-pic/c/chilblain_lupus/

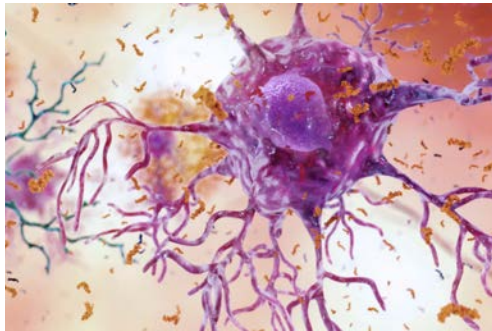
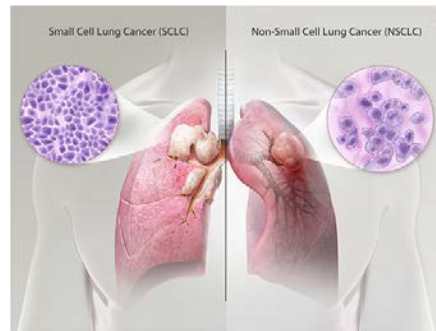


<https://quizlet.com/326138519/immuno-l26-anti-inflammatory-immunosuppressive-immunomodulatory-drug-strategies-edited-flash-cards/>



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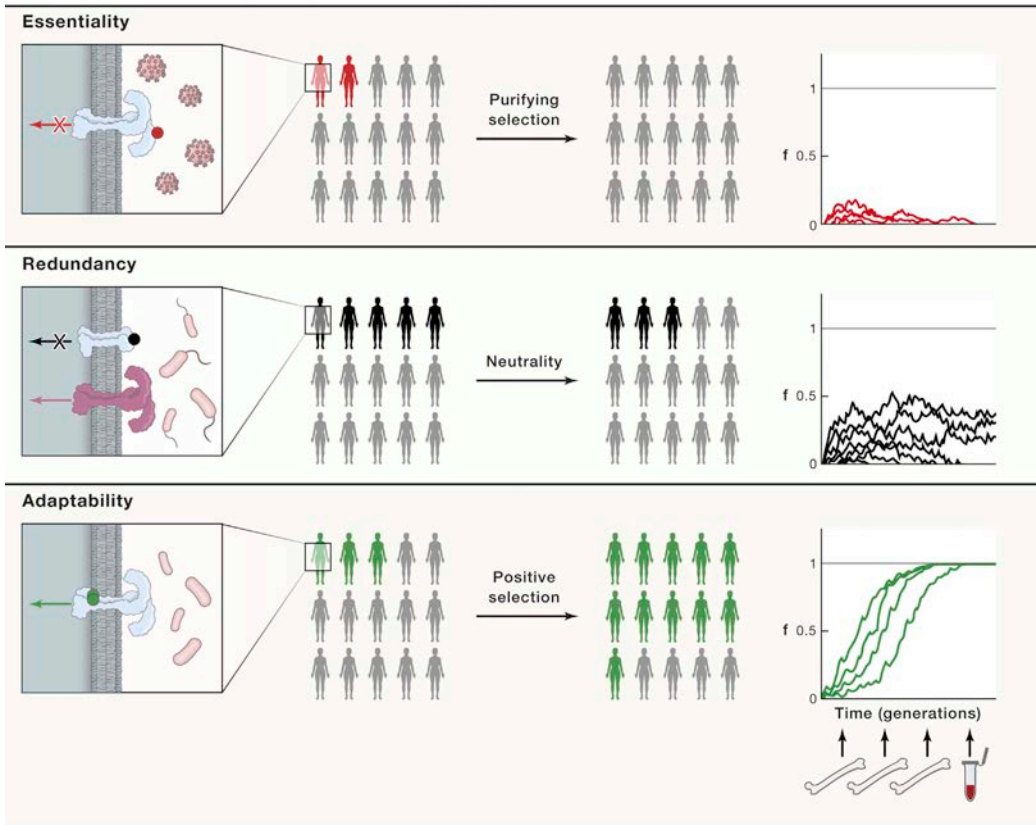
Inflammation – bad!



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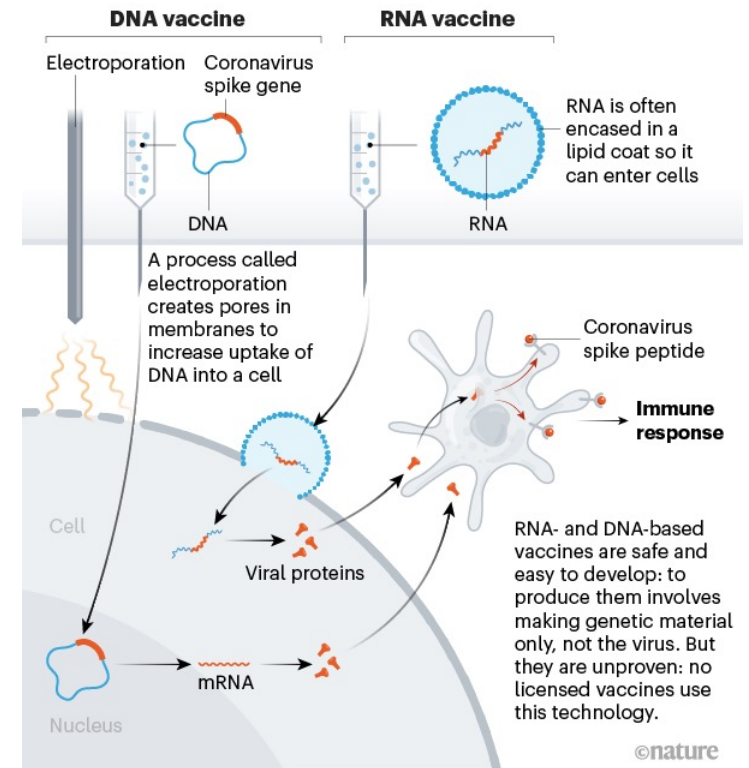
But... Inflammation is also good (essential, actually)

1. Inflammation has enabled human evolution



2. Inflammation is the basis of vaccines

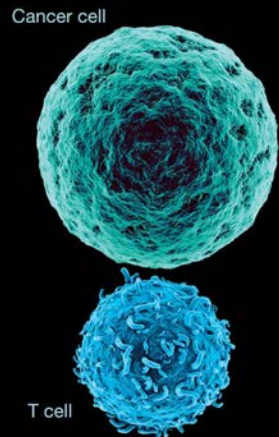
NUCLEIC-ACID VACCINES



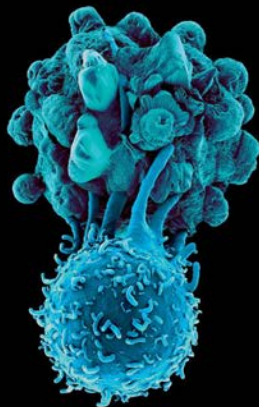
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Quintana-Murci, *Cell* 2019
Shuultz, Sackton, *eLife* 2019
Callaway, *Nature* 2020

Inflammation is also the basis for cancer immunotherapy



T cell approaches cancer cell.



T cell attacks cancer cell.



Cancer cell destroyed.

Tasuku Honjo



James Allison



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<https://www.northshore.org/kellogg-cancer-center/our-services/immunotherapy/>
<https://www.the-scientist.com/news-opinion/james-allison-and-tasuku-honjo-win-nobel-prize-64879>

Amin, JNCCN, 2020

Current approaches to treating inflammation have consequences

Inflammatory Bowel Disease



Type 1 (Juvenile) Diabetes



Rheumatoid Arthritis



- Infections
- Cancers

Psoriasis



How can inflammation be good and bad?

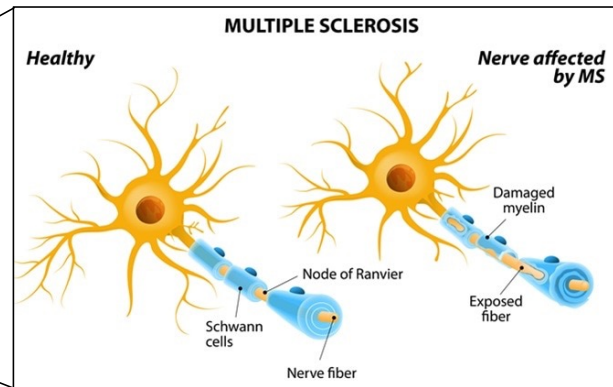
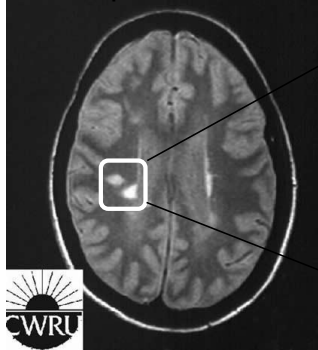


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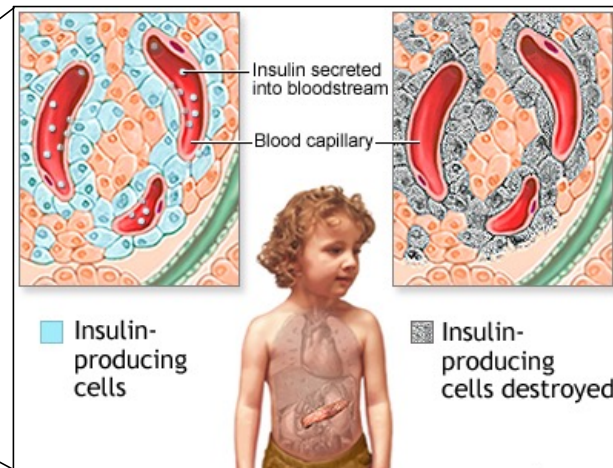
<https://www.youtube.com/watch?v=TCXpJFUzeQo>

1. Inflammatory responses can be misdirected (Autoimmunity)

Multiple Sclerosis

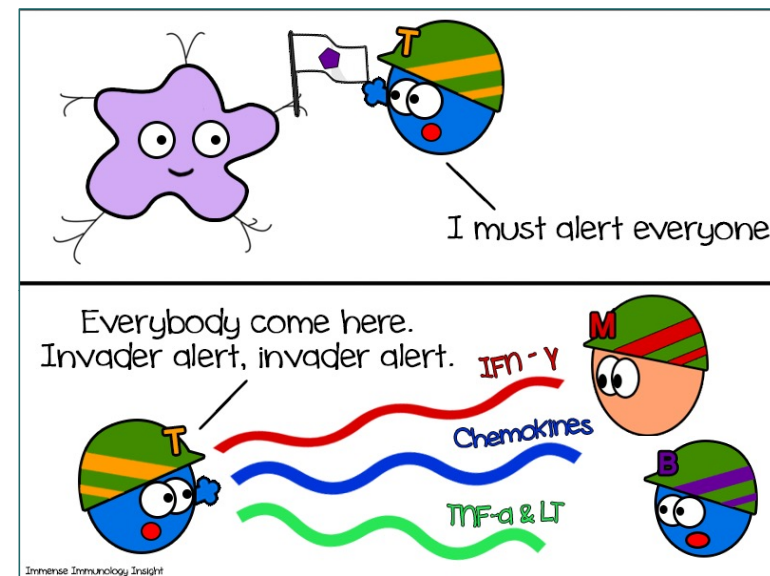
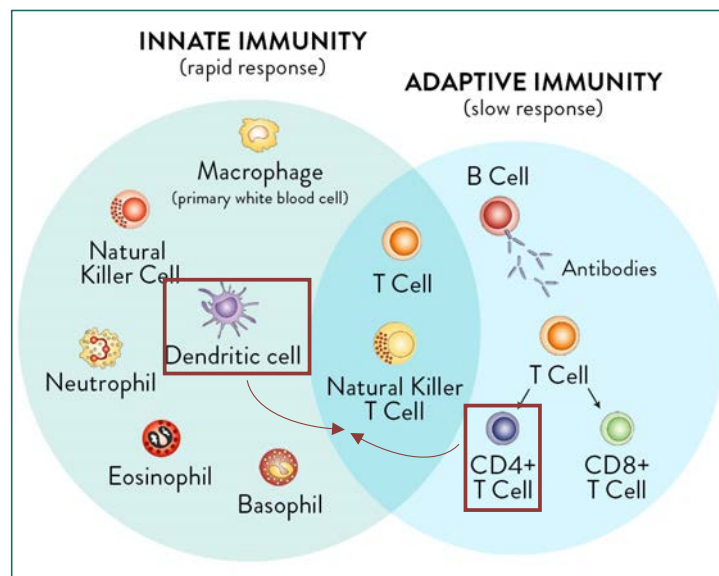


Type 1 (Juvenile) Diabetes

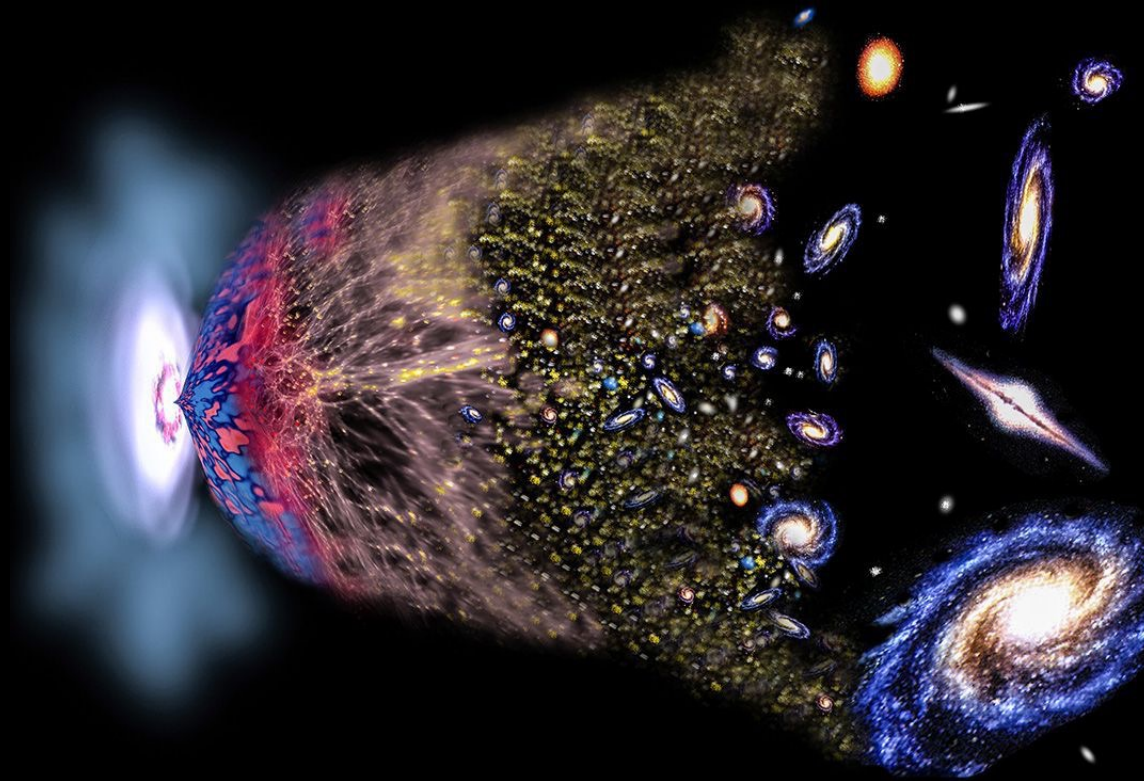


2. Not all inflammatory responses are the same

Type 1 responses	Type 2 responses	Type 3 responses
Intracellular pathogens (e.g., viruses, intracellular bacteria)	Multicellular parasites (e.g., parasitic worms)	Extracellular bacteria, fungi
Macrophage, NK, CTL	Basophil, Eosinophil	Neutrophil, Epithelial repair



T cell activation determines the outcome of inflammation

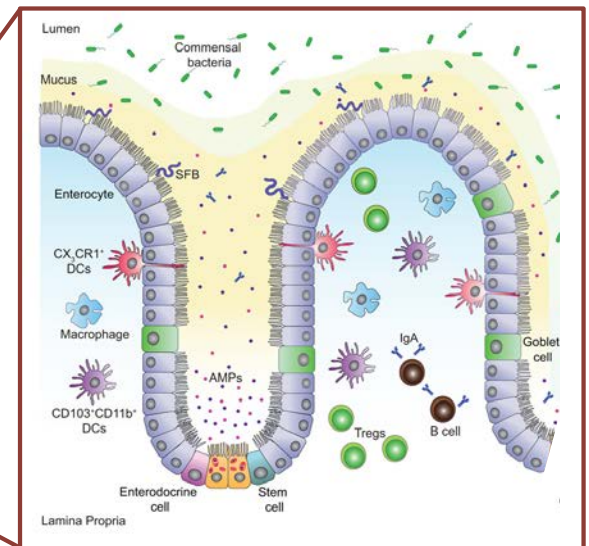
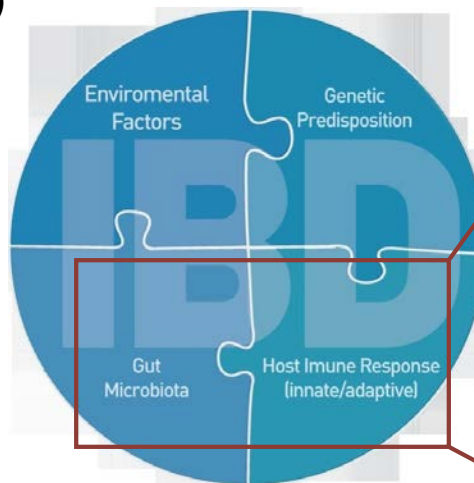
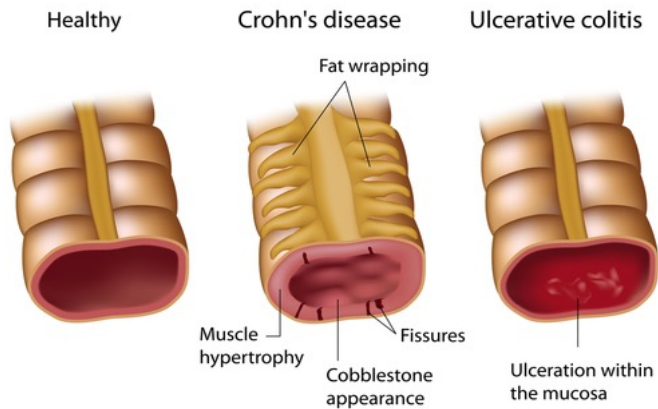


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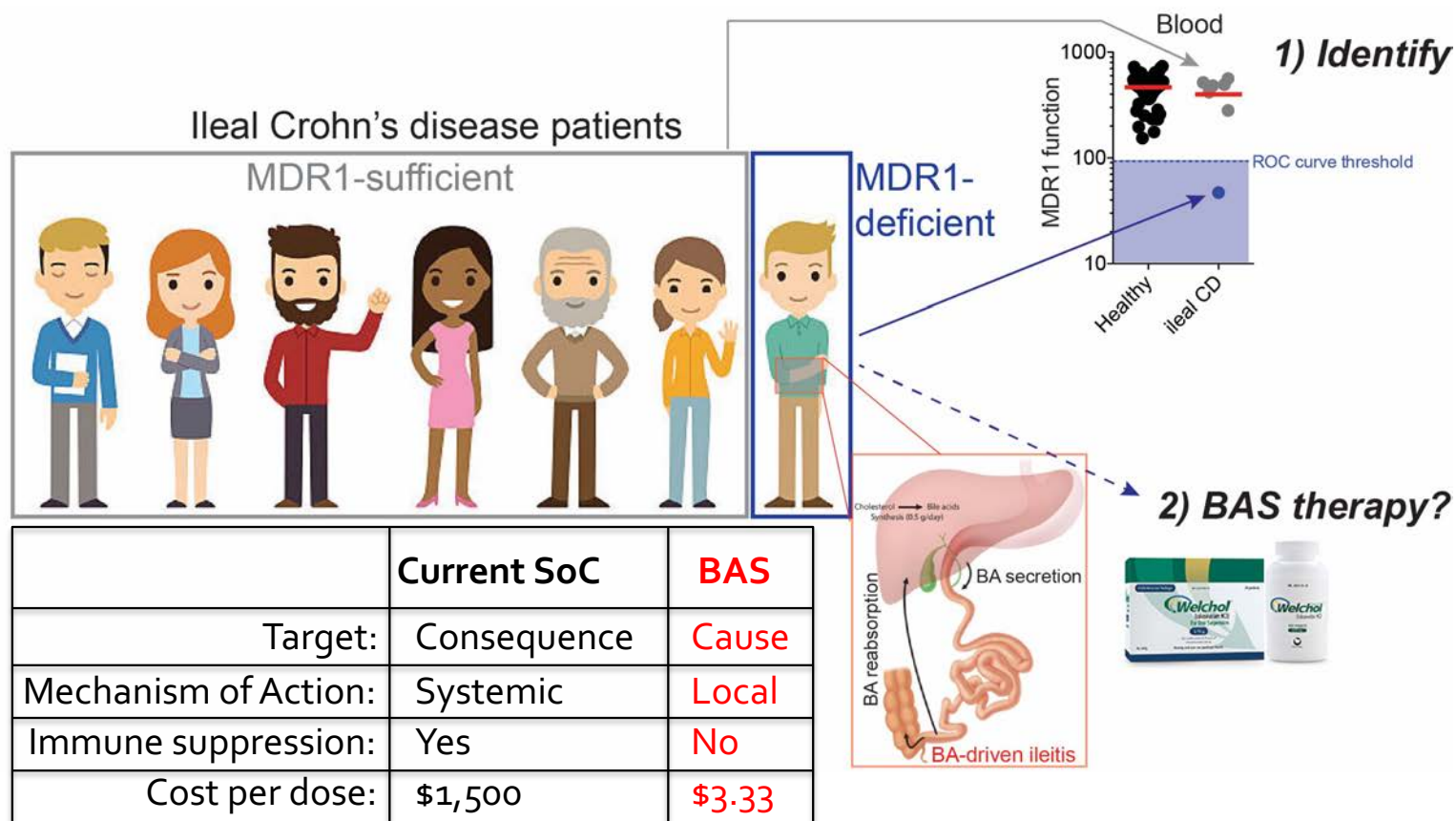
<https://www.smithsonianmag.com/smithsonian-institution/what-astronomers-are-still-discovering-about-big-bang-theory-180949794/>

Deciphering T cell dysfunction in chronic inflammation

Inflammatory Bowel Diseases (IBDs)

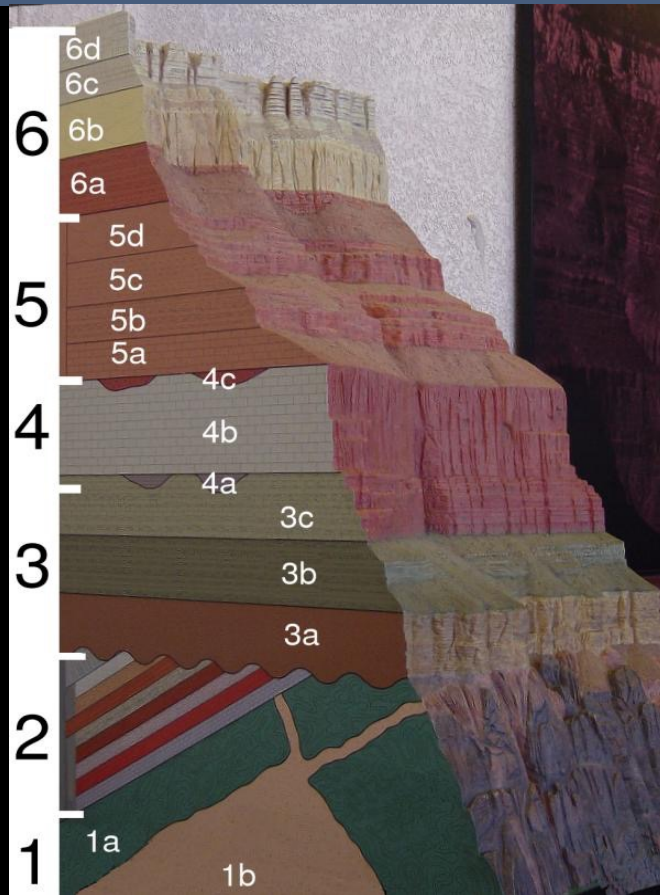


A precision medicine approach to treating Crohn's disease



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The Sundrud Lab: Probing the biology of T cells to treat the untreatable



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Acknowledgements

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Contact us

Sundrudlab.com



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UPCOMING LECTURE



Michalina Janiszewska, PhD

Assistant Professor
Department of Molecular Medicine

Mapping the Secret Complexity of Tumors to Defeat Aggressive Cancers

Wednesday, April 21, 2021

1:00 PM PT/4:00 PM ET

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