

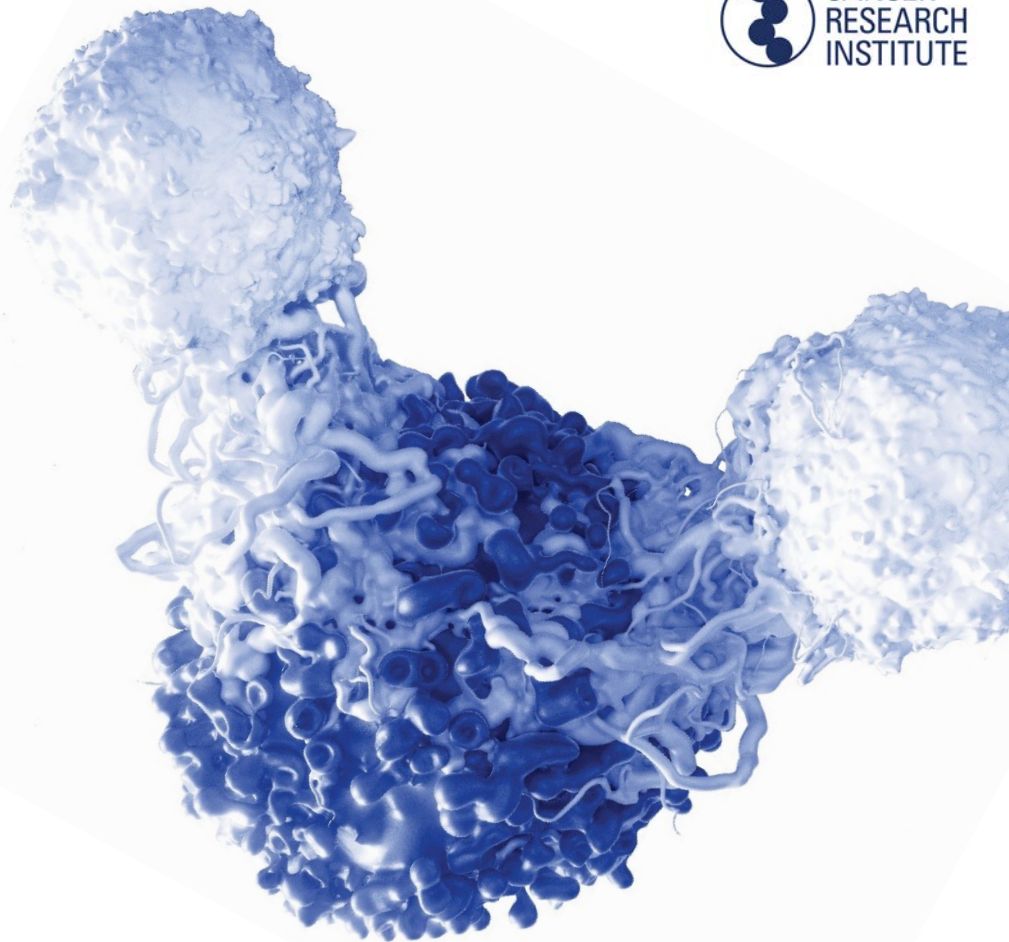
CANCER RESEARCH INSTITUTE

IMMUNOTHERAPY **PATIENT SUMMIT**

San Diego June 29, 2019

Brian Brewer
Cancer Research Institute

WELCOME



SPECIAL THANKS To our San Diego partners



Immunotherapy
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SCHOOL OF MEDICINE

Our Sponsors



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Thank you to those who helped promote the summit

- Addario Lung Cancer Foundation
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- Crush it for Curtis Foundation
- Colorectal Cancer Alliance
- FORCE
- Imerman Angels
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- Leukemia & Lymphoma Society
- LUNGevity
- Michelle's Place
- Moores Cancer Center at UC San Diego Health
- Pancreatic Cancer Action Network
- Patient Empowerment Network
- Rotary International
- San Diego Center for Precision Immunotherapy
- Sharp Center for Research
- Us TOO
- Young Survival Coalition

Scientific Experts

Tanya B. Dorff, M.D.

City of Hope

Roger S. Lo, M.D., Ph.D.

UC Los Angeles Health

Aaron M. Miller, M.D., Ph.D.

Moore's Cancer Center at UC San Diego Health

Rebecca A. Shatsky, M.D.

Moore's Cancer Center at UC San Diego Health

Patient Experts

Dan Engel

Melanoma

Janie Ferling

Melanoma

Gina Ferreira

Non-Hodgkin lymphoma

Gordon Levine

Colorectal Cancer

SCHEDULE OF EVENTS

9:00 am	Registration and networking
10:00 am	Program commences
	WELCOME Brian Brewer
10:15 am	HEAR FROM THE EXPERTS Immunotherapy Basics Aaron M. Miller, M.D., Ph.D.
	PANEL: RESEARCH UPDATES Moderator Aaron M. Miller, M.D., Ph.D.
	Panelists Tanya B. Dorff, M.D. Roger S. Lo, M.D., Ph.D. Rebecca A. Shatsky, M.D.
11:30 am	PATIENT PERSPECTIVE A message from Janie Ferling, melanoma survivor and patient advocate
12:00 pm	Lunch and networking

1:00 pm	LEARN ABOUT CLINICAL TRIALS Brian Brewer
1:15 pm	IMMUNOTHERAPY PATIENT PANEL Moderator Brian Brewer
	Panelists Dan Engel Gina Ferreira Gordon Levine
2:00 pm	Transition Break
2:15 pm	BREAKOUT SESSIONS Your choice of moderated, deeper-dive Q&A with our experts
	General Immunotherapy Aaron M. Miller, M.D., Ph.D.
	Breast Cancer Rebecca A. Shatsky, M.D.
	Melanoma Roger S. Lo, M.D., Ph.D.
	Prostate Cancer Tanya B. Dorff, M.D.
3:15 pm	Program closes
9:00 am – 4:00 pm	CLINICAL TRIAL NAVIGATOR APPOINTMENTS Appointments are available all day. If you didn't pre-register, but you are interested in scheduling an appointment, please visit the Clinical Trial Navigator desk for more information.

You will receive two emails after the summit:

1. **A survey** to share your feedback on the summit as well as insights into future programming.
2. **Information** from the summit day, including this presentation and instructions on how to use our [Clinical Trial Finder service](#).

Immunotherapy 101



Aaron M. Miller, M.D., Ph.D.

Assistant Professor of Medicine

Division of Hematology and Oncology

UC San Diego Health

Moore's Cancer Center



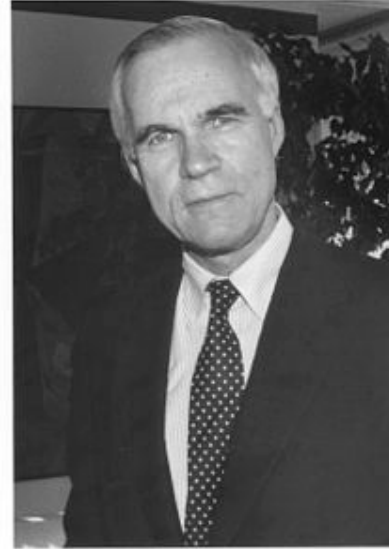
Origin & Revival of Immunotherapy



1890s:
William B. Coley

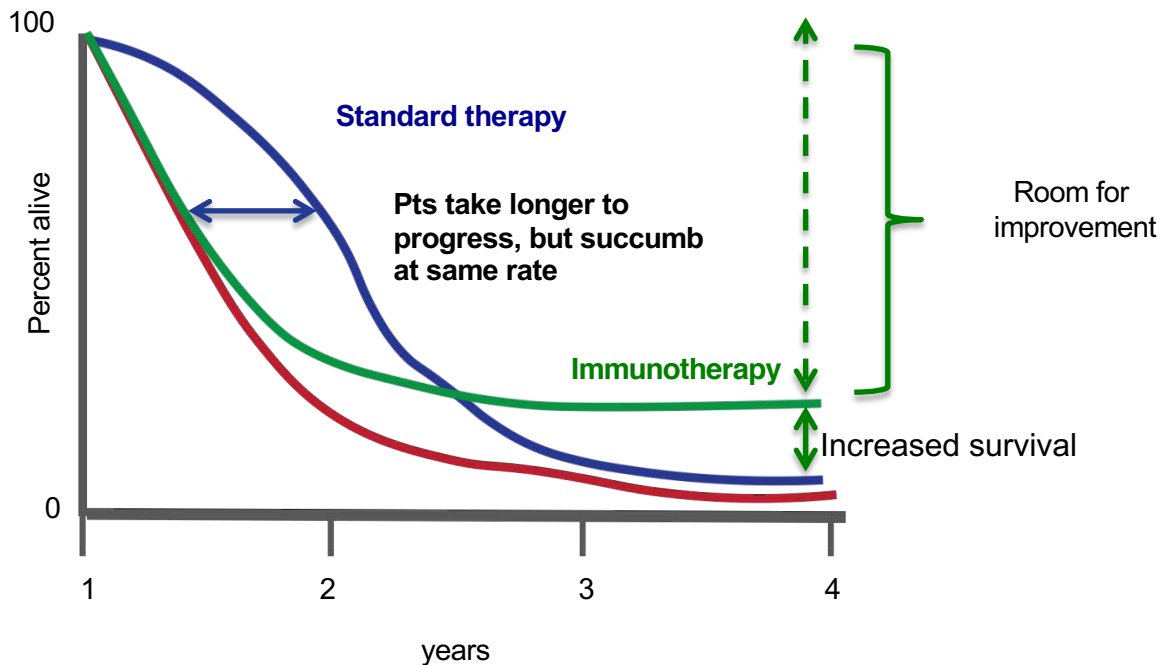


1900s:
Paul Ehrlich

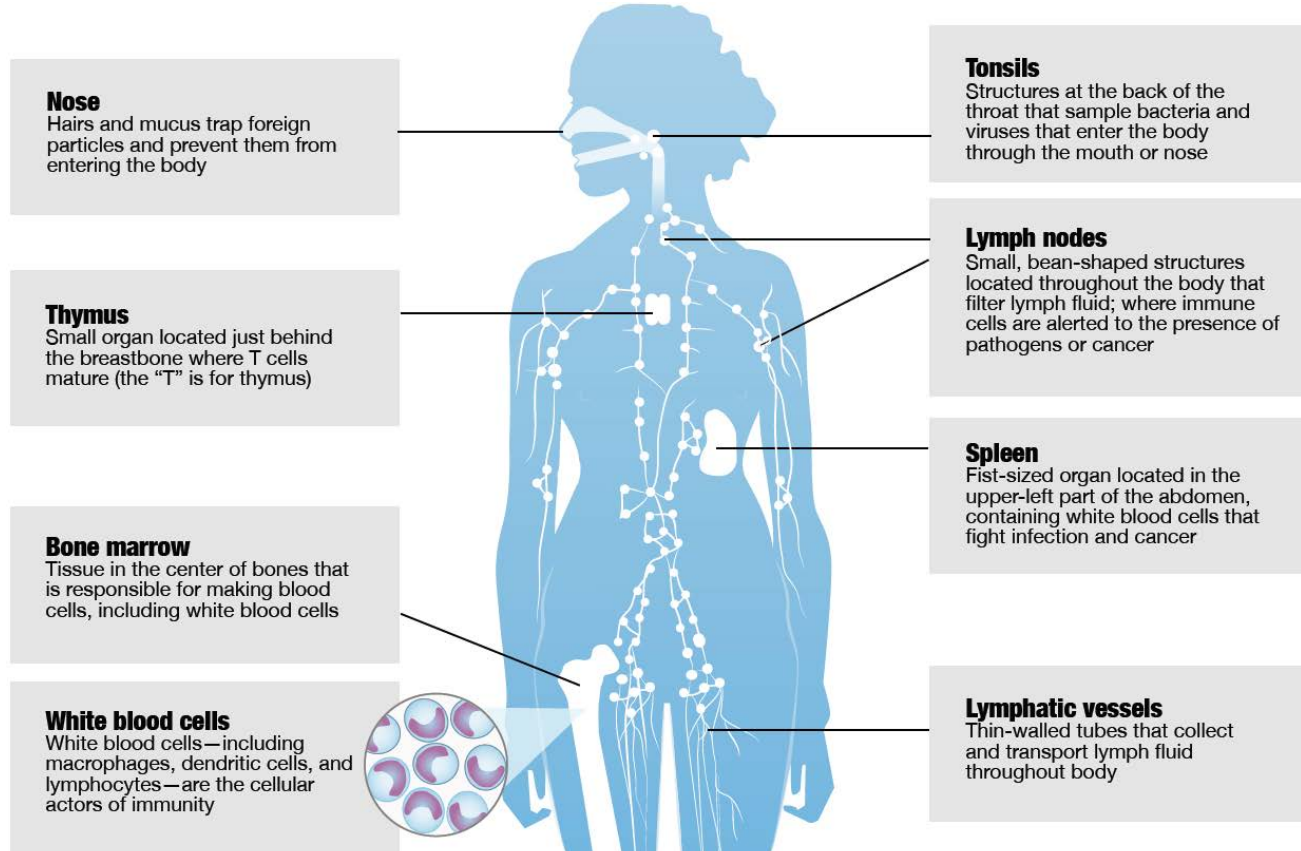


1960s:
Lloyd J. Old

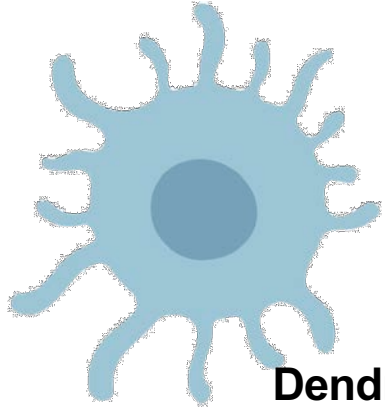
Immunotherapy: A Potential Cure?



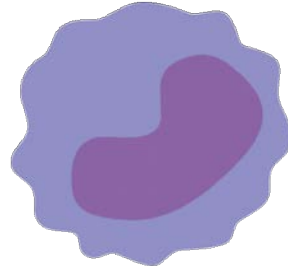
The Immune System At a Glance



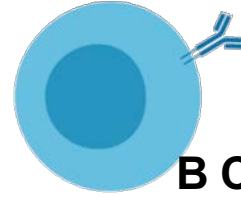
The Cells of the Immune System



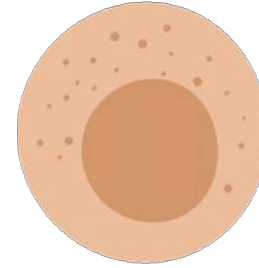
**Dendritic
Cell**



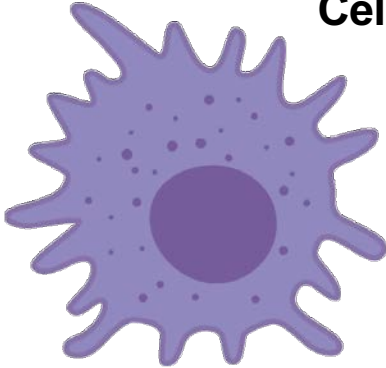
Monocyte



B Cell



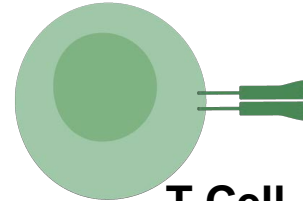
**Natural
Killer Cell**



Macrophage

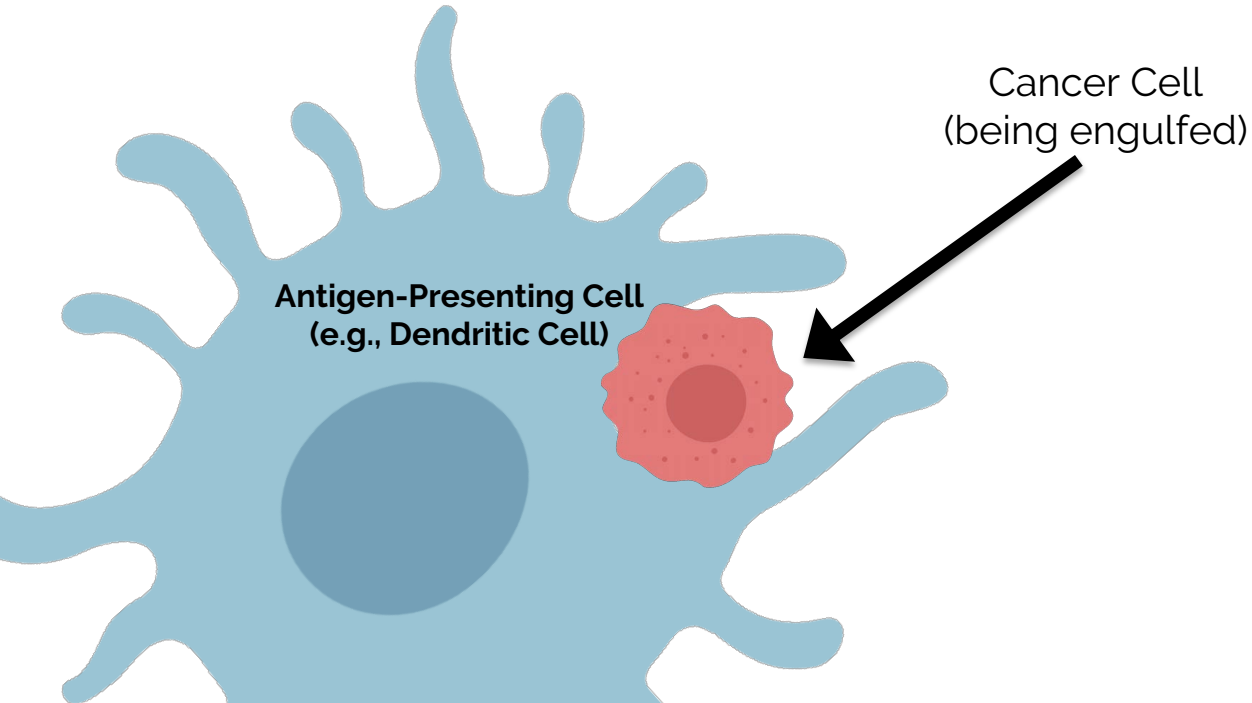


Neutrophil



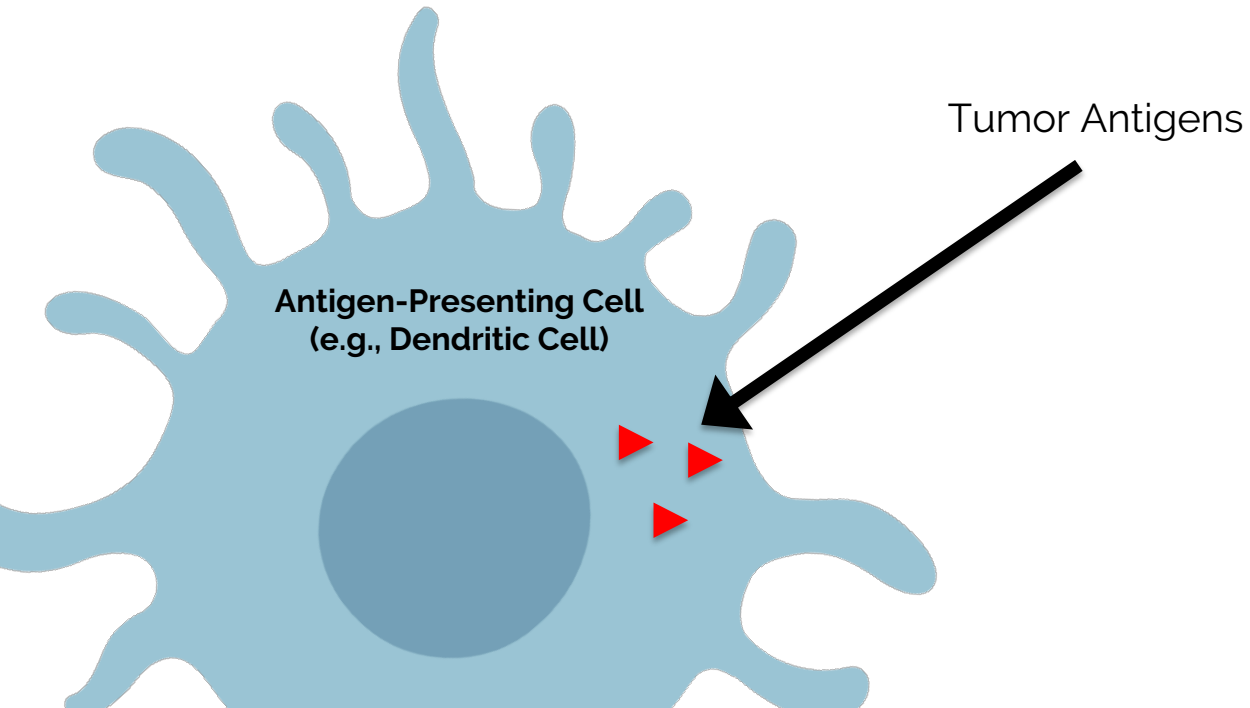
T Cell

Adaptive Immune Responses Against Cancer



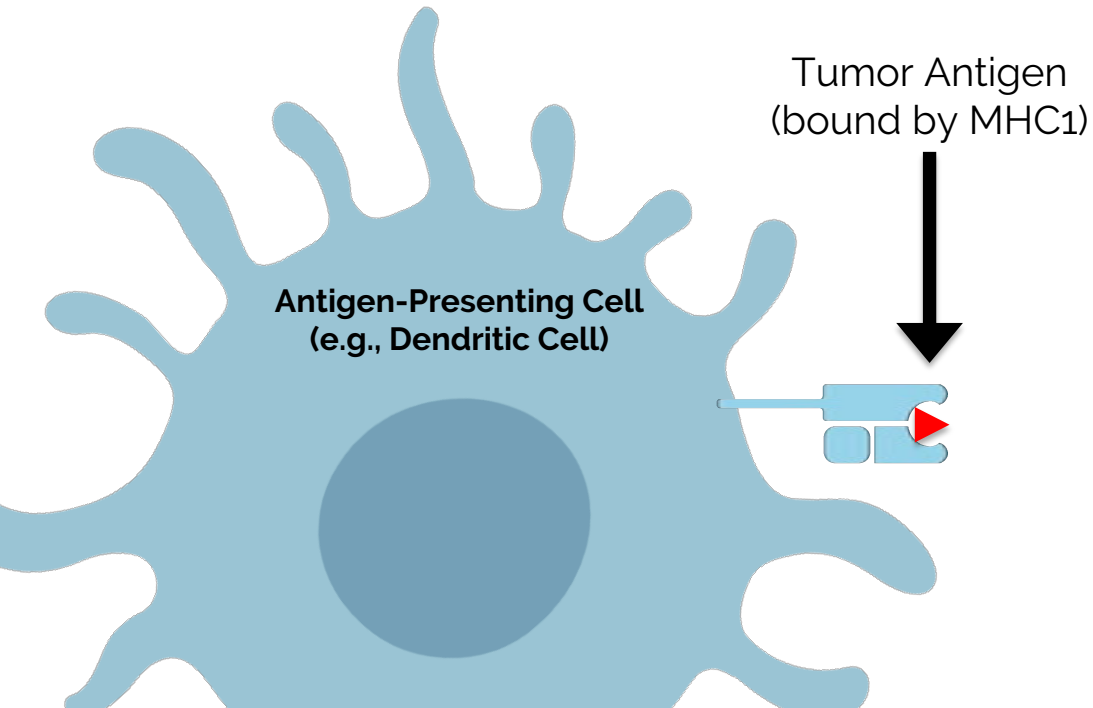
Adaptive Immune Responses Against Cancer

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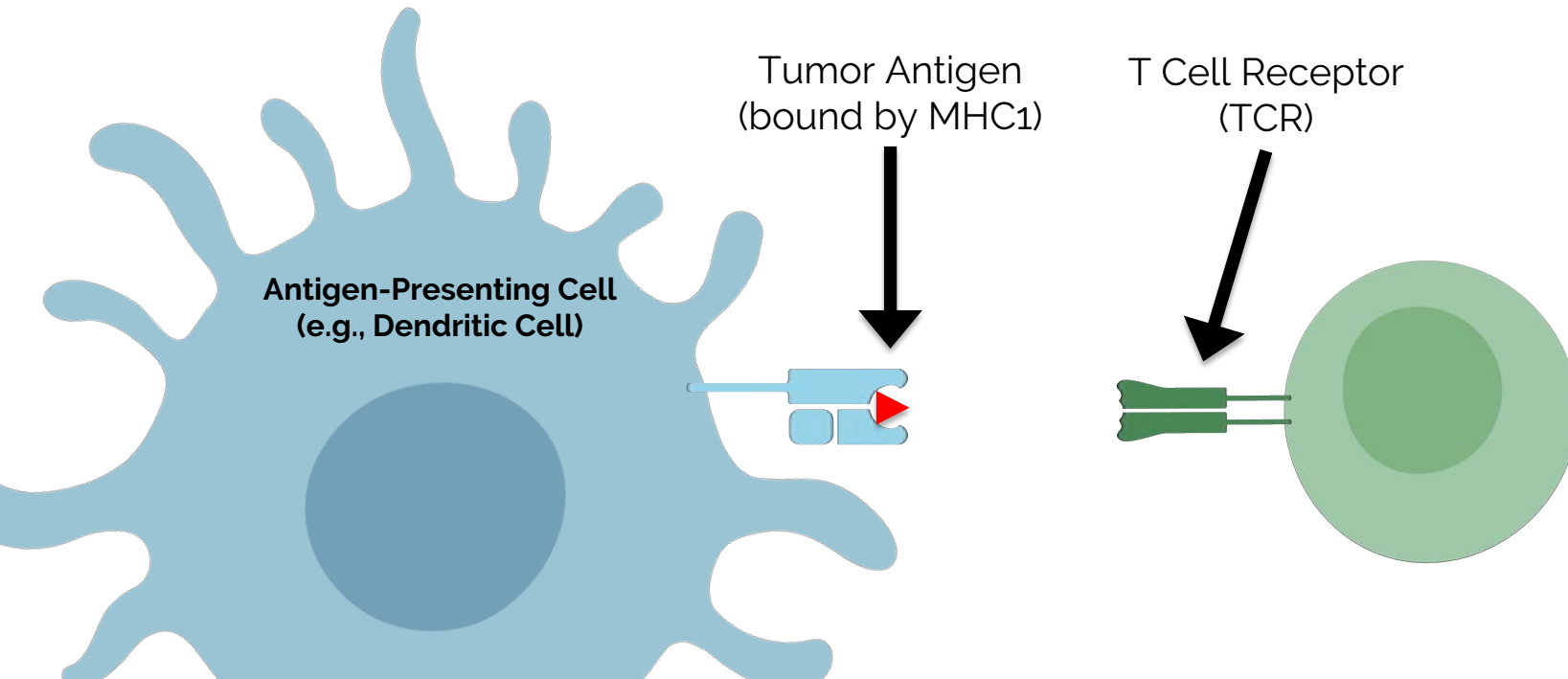
Adaptive Immune Responses Against Cancer

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RESEARCH



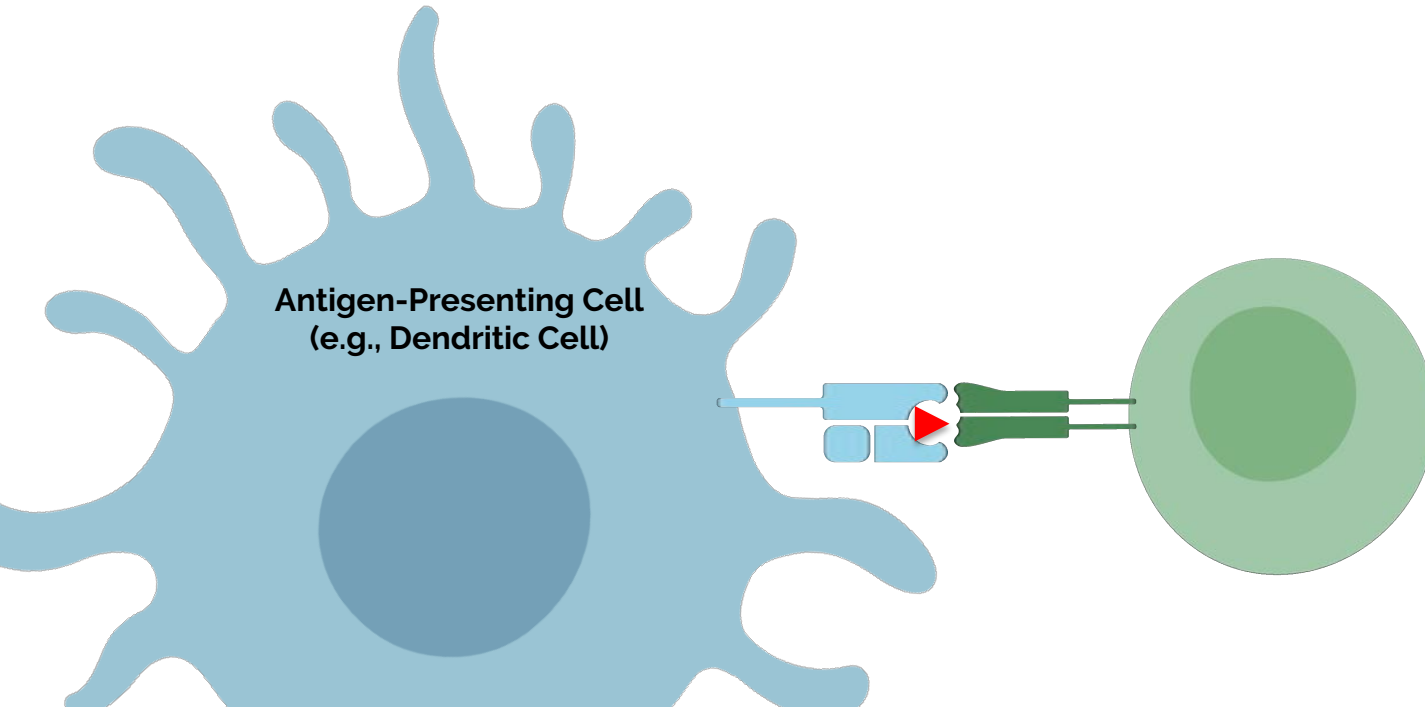
Adaptive Immune Responses Against Cancer

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RESEARCH



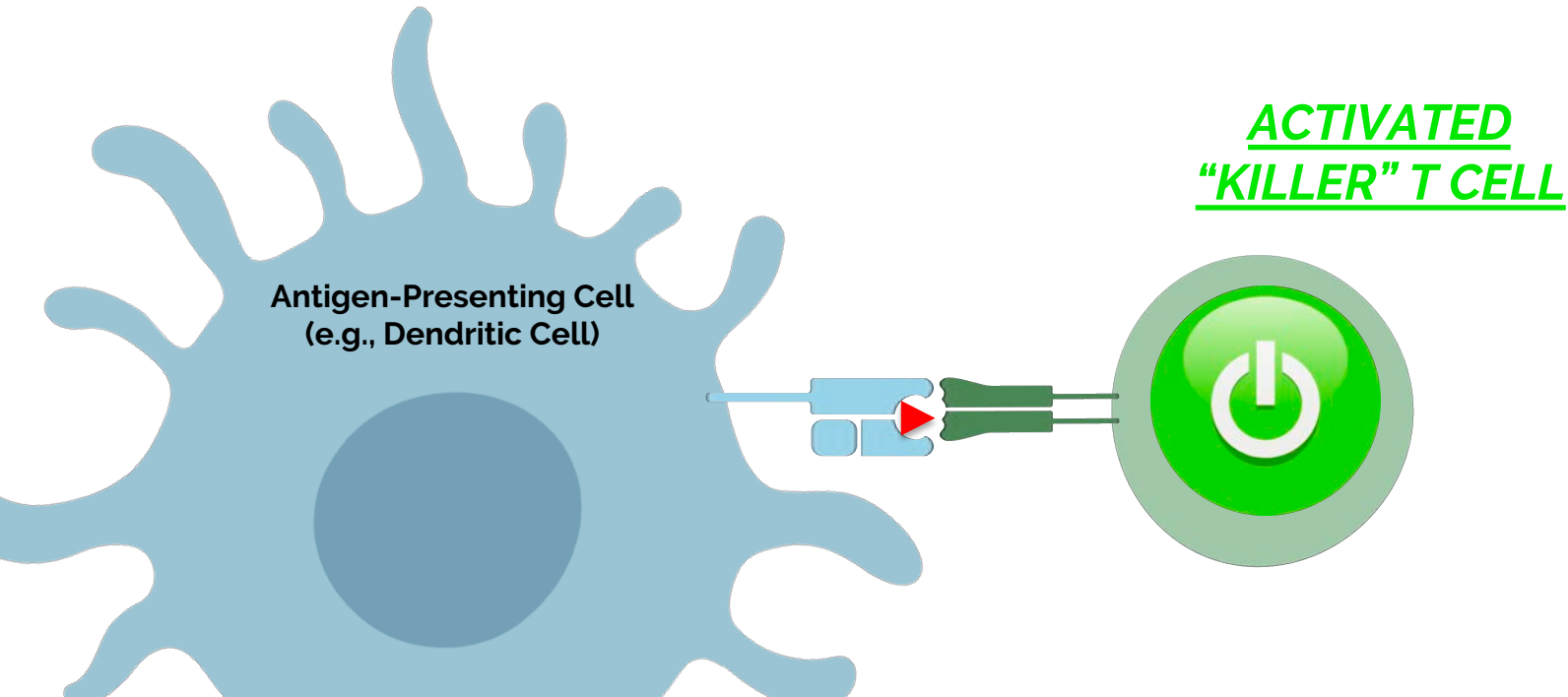
Adaptive Immune Responses Against Cancer

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Adaptive Immune Responses Against Cancer

CR
CENTRE
FOR
RESEARCH
IN
TUMOUR
BIOLOGY

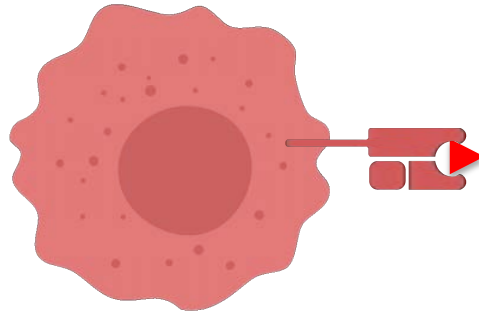


Adaptive Immune Responses Against Cancer

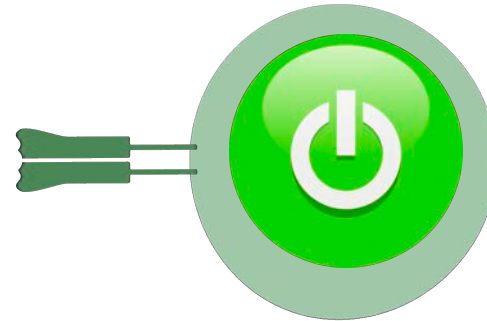
CR
YEARS IN
RESEARCH



Cancer Cell

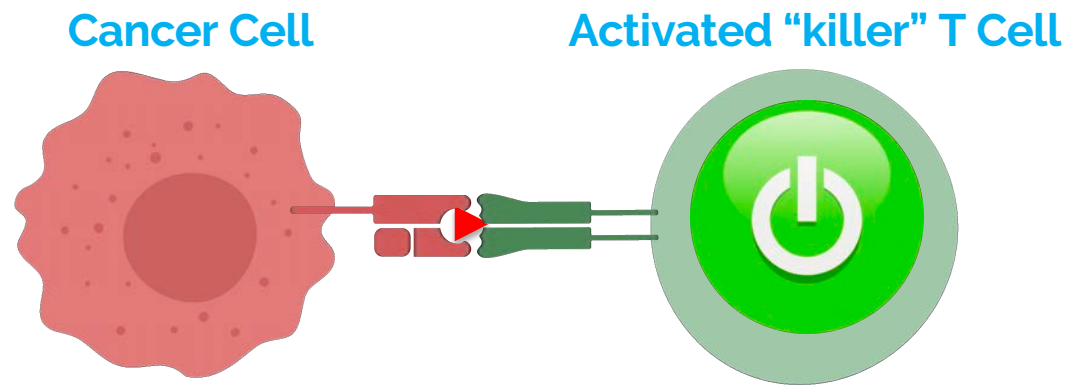


Activated "killer" T Cell



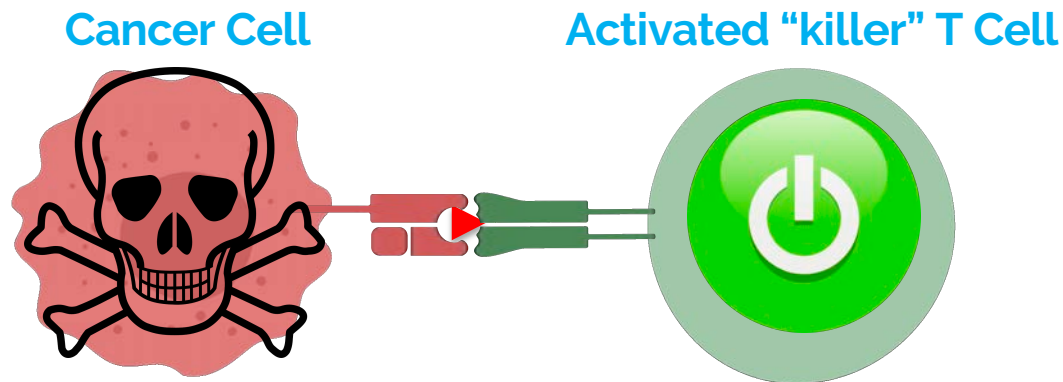
Adaptive Immune Responses Against Cancer

CR
YEARS IN
RESEARCH



Adaptive Immune Responses Against Cancer

CR
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RESEARCH



CANCER CELL ELIMINATED!

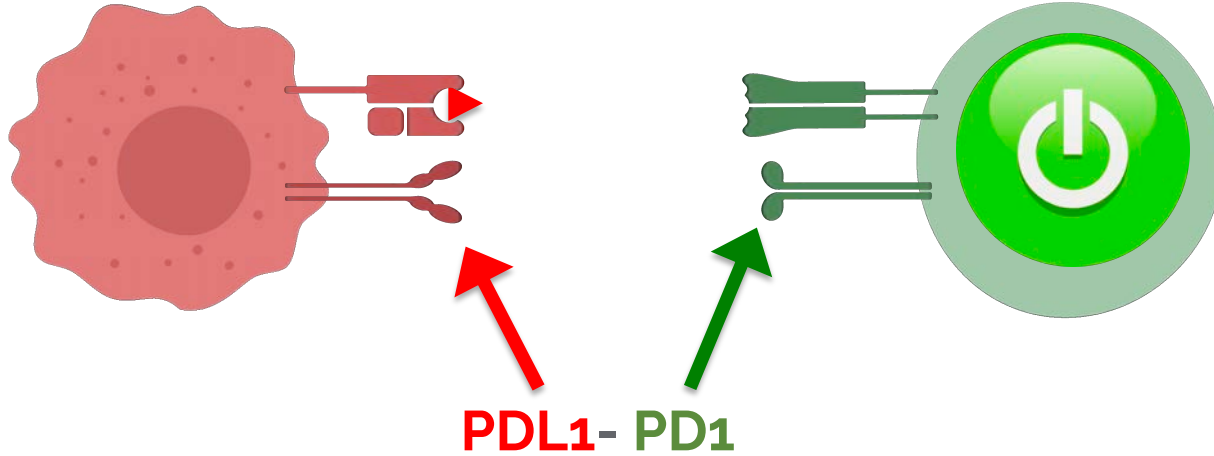
Immune Checkpoints Can Suppress Immune Responses

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BIORESEARCH



Cancer Cell

Activated "killer" T Cell



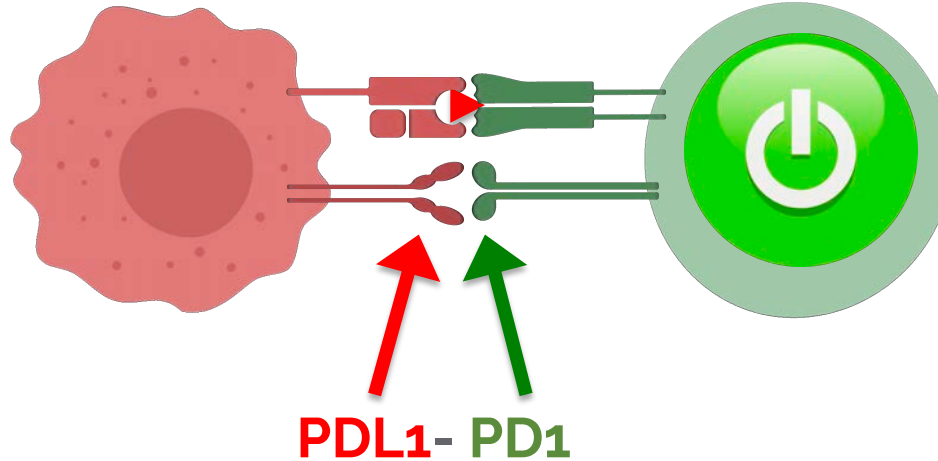
Immune Checkpoints Can Suppress Immune Responses

65
YEARS IN
RESEARCH



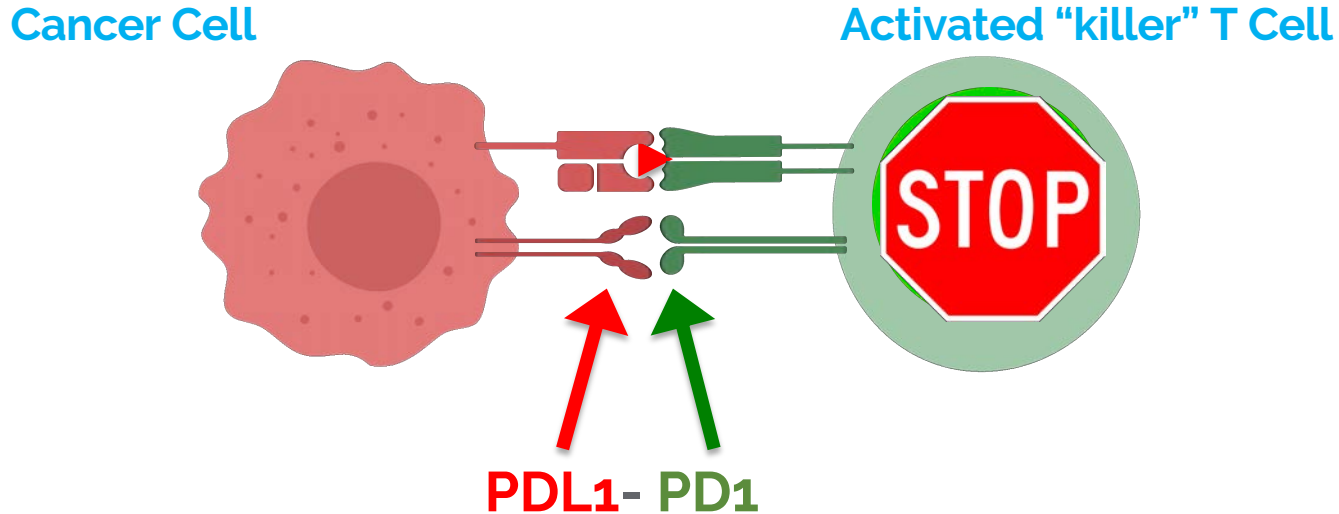
Cancer Cell

Activated "killer" T Cell



Immune Checkpoints Can Suppress Immune Responses

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YEARS IN
RESEARCH



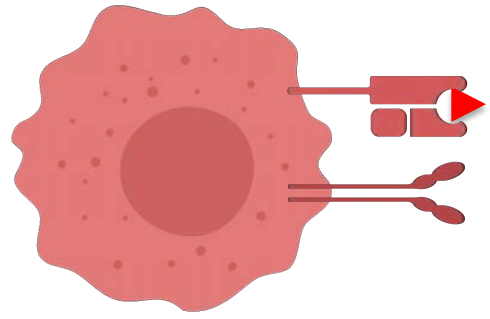
Normally, **PDL1**-**PD1** leads to T cell "exhaustion"

Checkpoint Immunotherapy Can Promote Anti-Cancer Activity

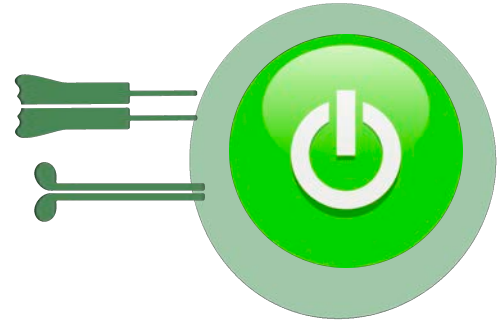
65
YEARS IN
RESEARCH



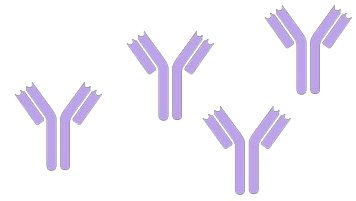
Cancer Cell



Activated "killer" T Cell



PD-1/PD-L1
Checkpoint Inhibitors

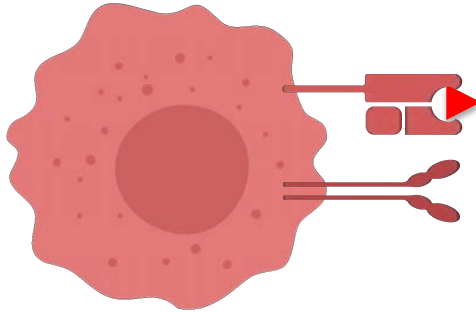


Checkpoint Immunotherapy Can Promote Anti-Cancer Activity

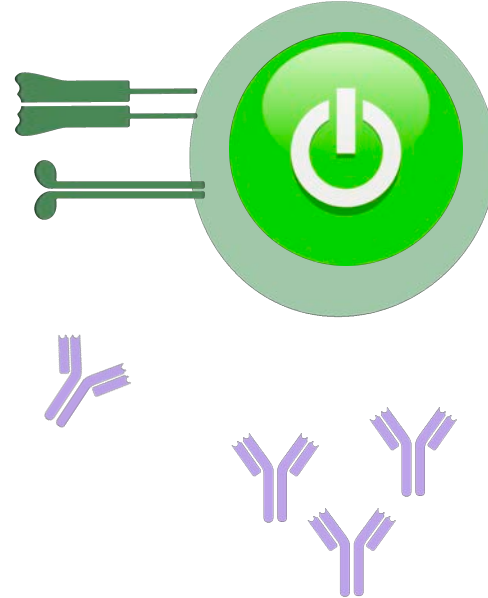
65
YEARS IN
ONCOLOGY



Cancer Cell



Activated "killer" T Cell

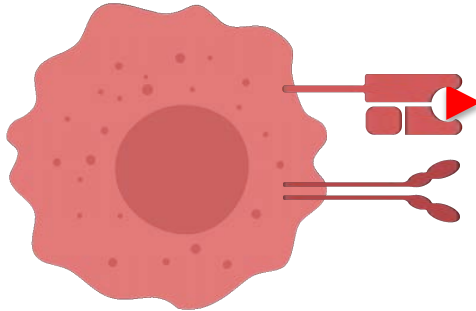


Checkpoint Immunotherapy Can Promote Anti-Cancer Activity

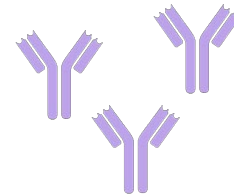
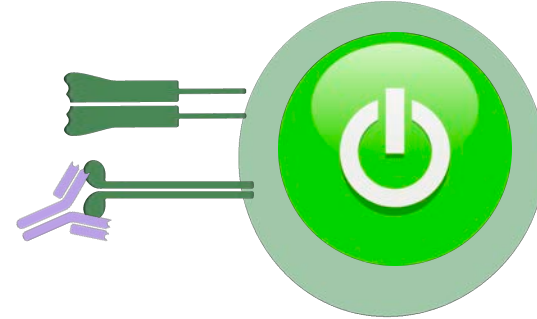
65
YEARS IN
RESEARCH



Cancer Cell

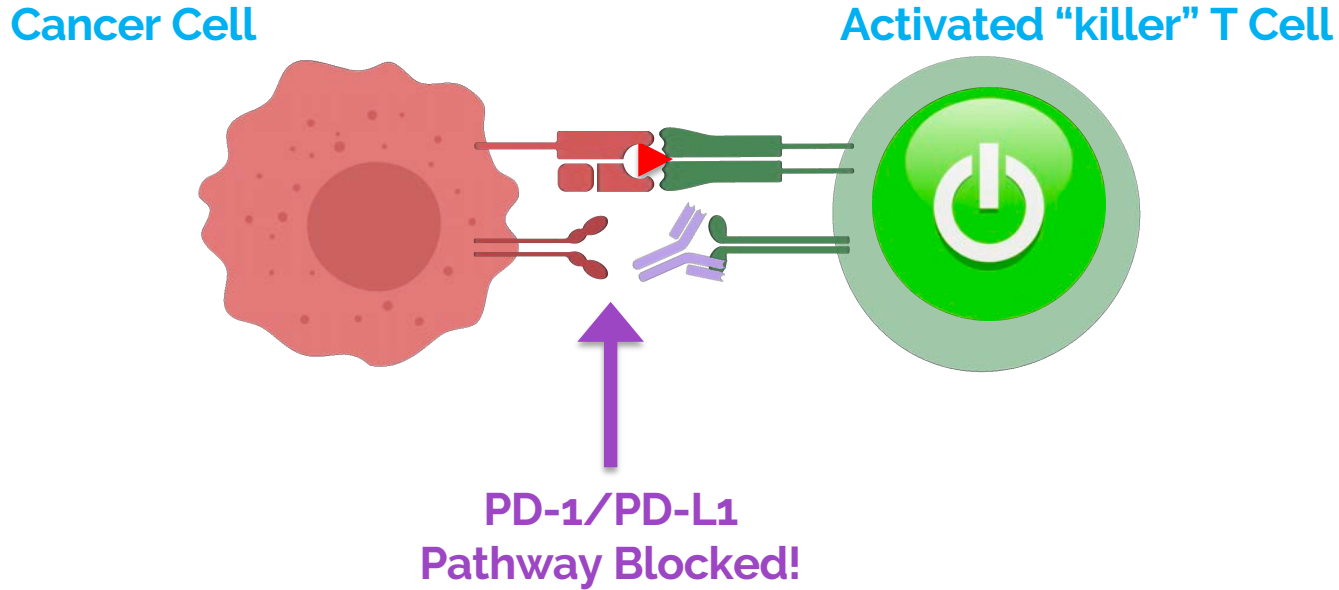


Activated "killer" T Cell



Checkpoint Immunotherapy Can Promote Anti-Cancer Activity

65
YEARS IN
BIORESEARCH



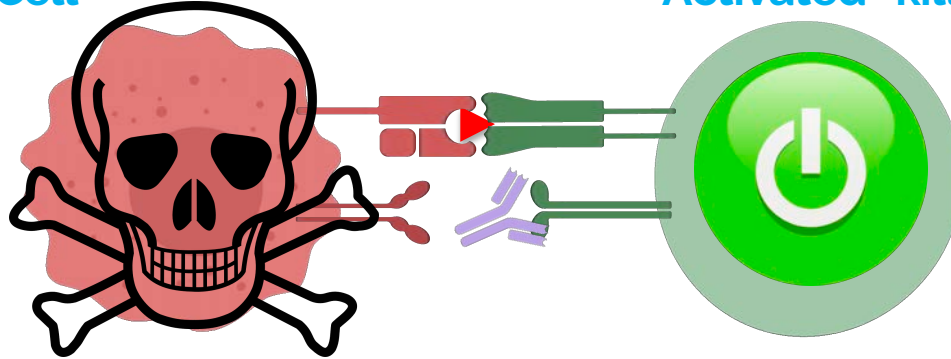
Checkpoint Immunotherapy Can Promote Anti-Cancer Activity

65
YEARS IN
RESEARCH



Cancer Cell

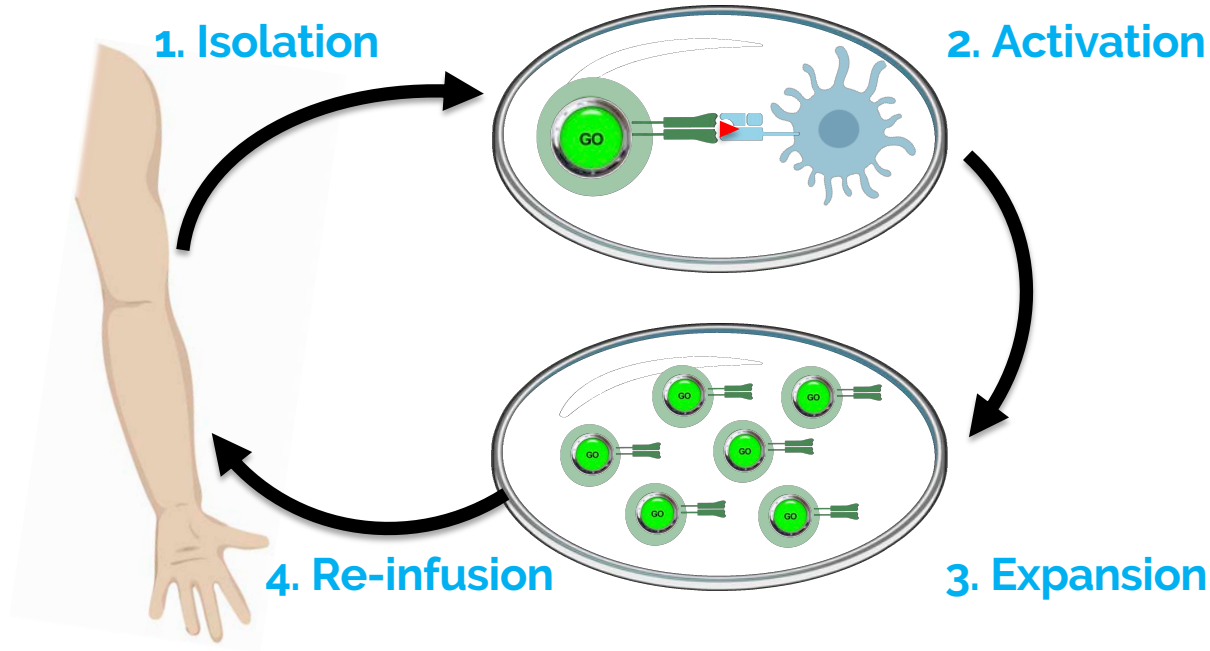
Activated "killer" T Cell



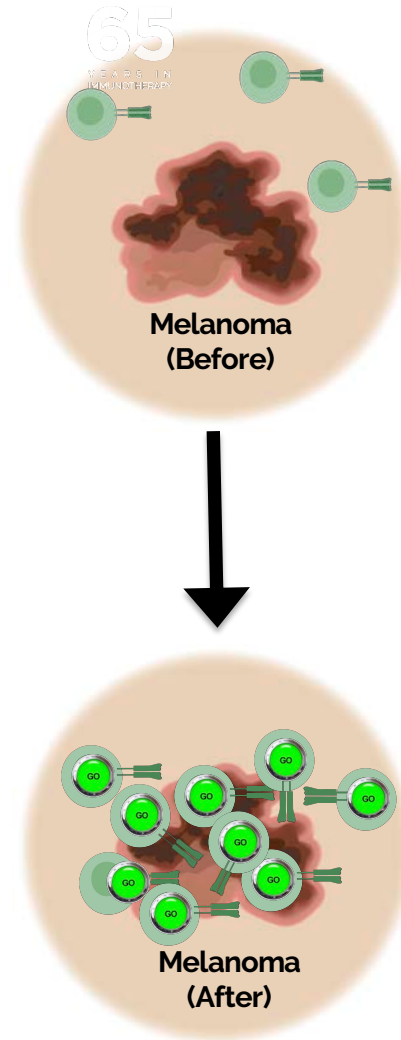
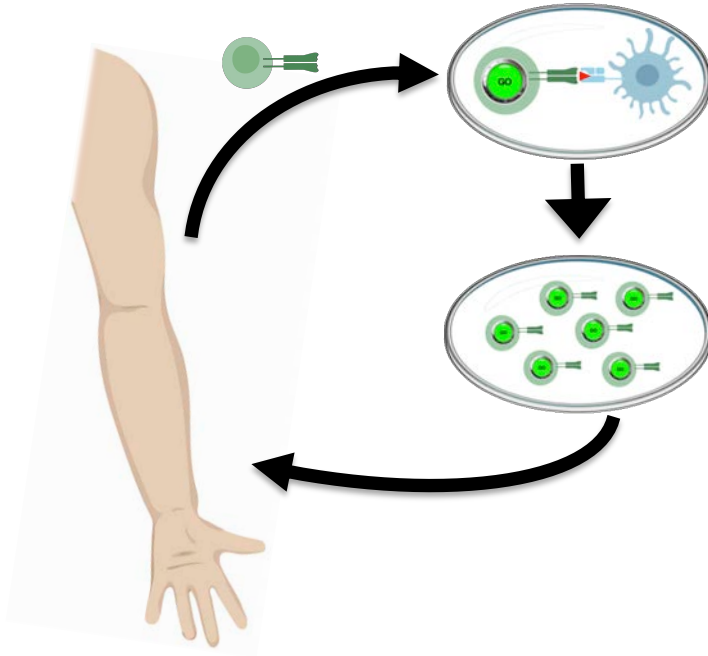
CANCER CELL ELIMINATED!

Adoptive T Cell Immunotherapy

65
YEARS IN
ONCOLOGY

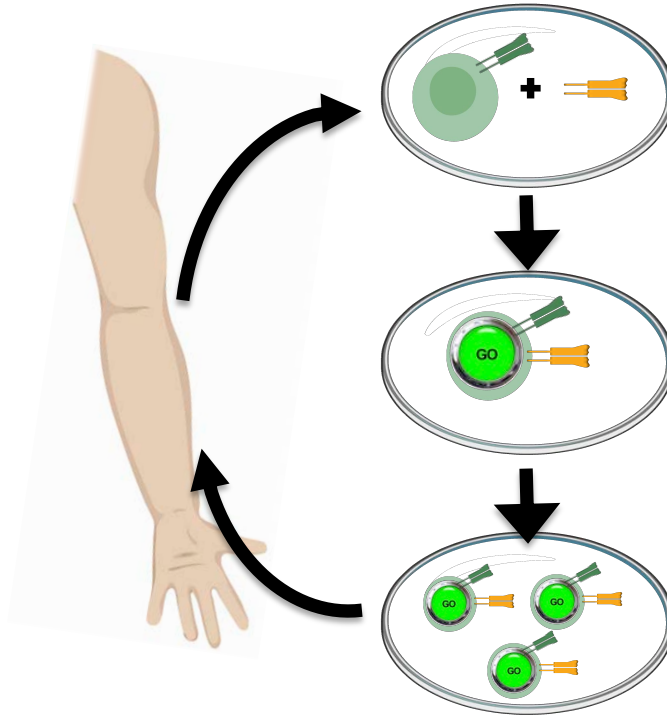


Adoptive T Cells In Action (Against Melanoma)



T Cell Receptor Engineering

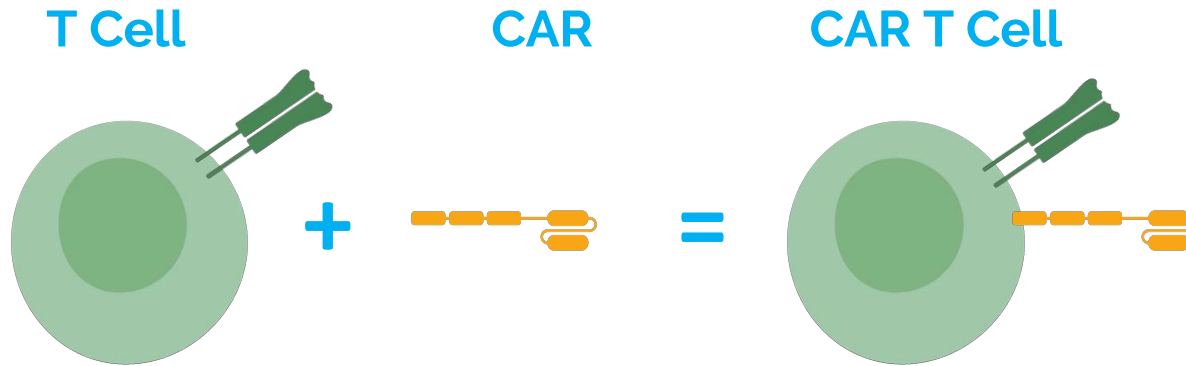
65
YEARS IN
BIOLOGICAL RESEARCH



Equip T cells with new,
cancer-targeting TCR

CAR T Cell Immunotherapy (Chimeric Antigen Receptor)

65
YEARS IN
RESEARCH

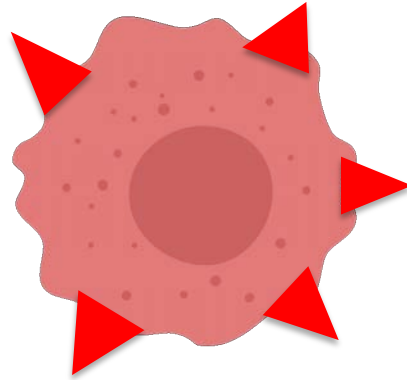


CAR T Cell Immunotherapy (Chimeric Antigen Receptor)

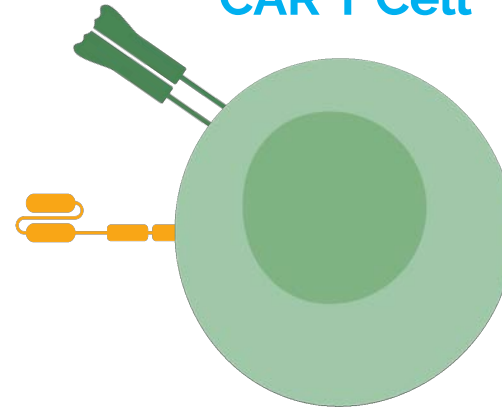
65
YEARS IN
ONCOLOGY



Cancer Cell



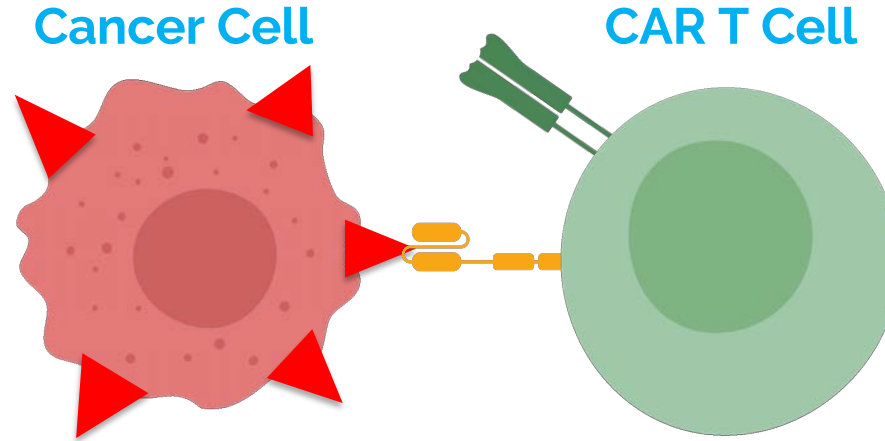
CAR T Cell



CARs enable MHC-independent targeting & killing!

CAR T Cell Immunotherapy (Chimeric Antigen Receptor)

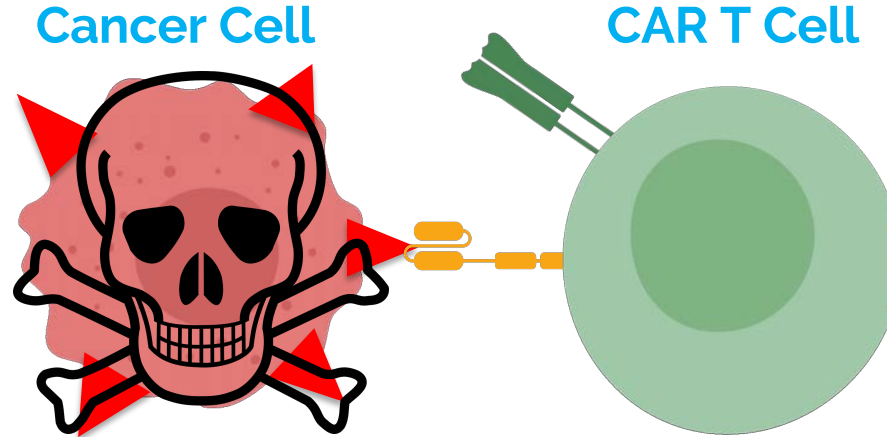
65
YEARS IN
ONCOLOGY



CARs enable MHC-independent targeting & killing!

CAR T Cell Immunotherapy (Chimeric Antigen Receptor)

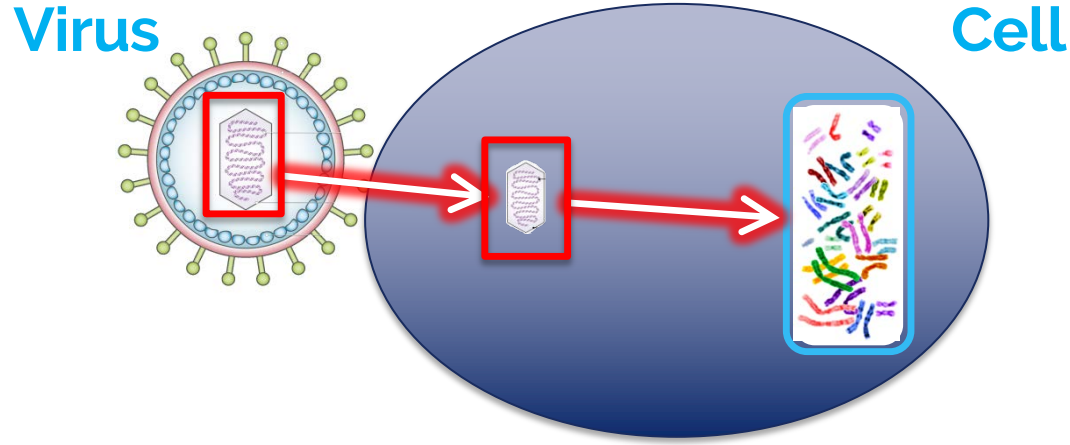
65
YEARS IN
ONCOLOGY



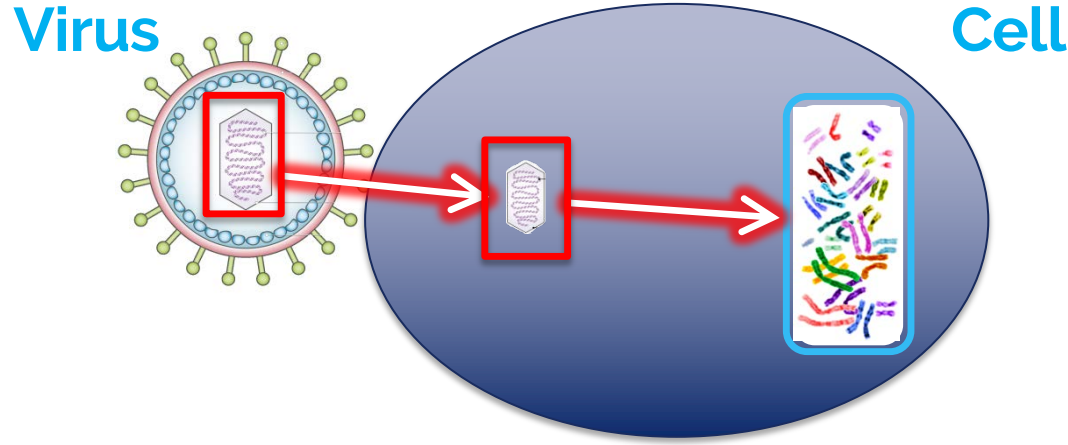
CARs enable MHC-independent targeting & killing!

Oncolytic Virus Immunotherapy

65
YEARS OF
RESEARCH



- Viruses can alter our cells' DNA, by inserting their own genetic material
- Impaired defenses make tumor cells more susceptible to infection

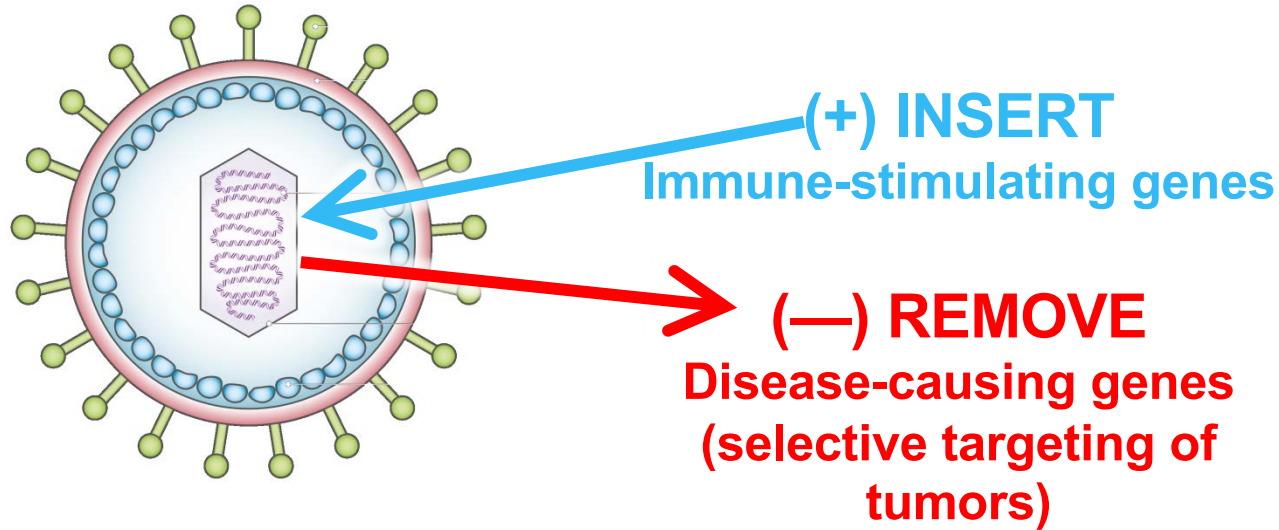


AFTER INJECTION:

- 1) Viruses cause tumor cells to “burst” & release antigens
- 2) Immune cells uptake & present tumor antigens
- 3) Stimulates adaptive, and potentially systemic, immune responses

Reprogramming Oncolytic Viruses To Enhance Anti-Tumor Activity

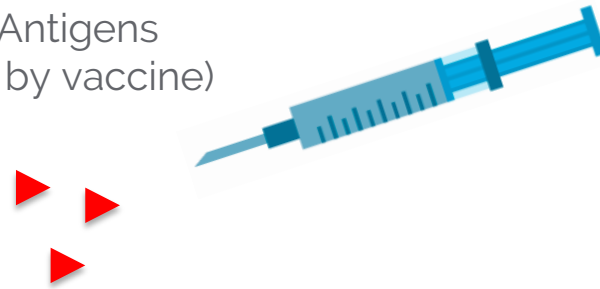
65
YEARS IN
ONCOLOGY



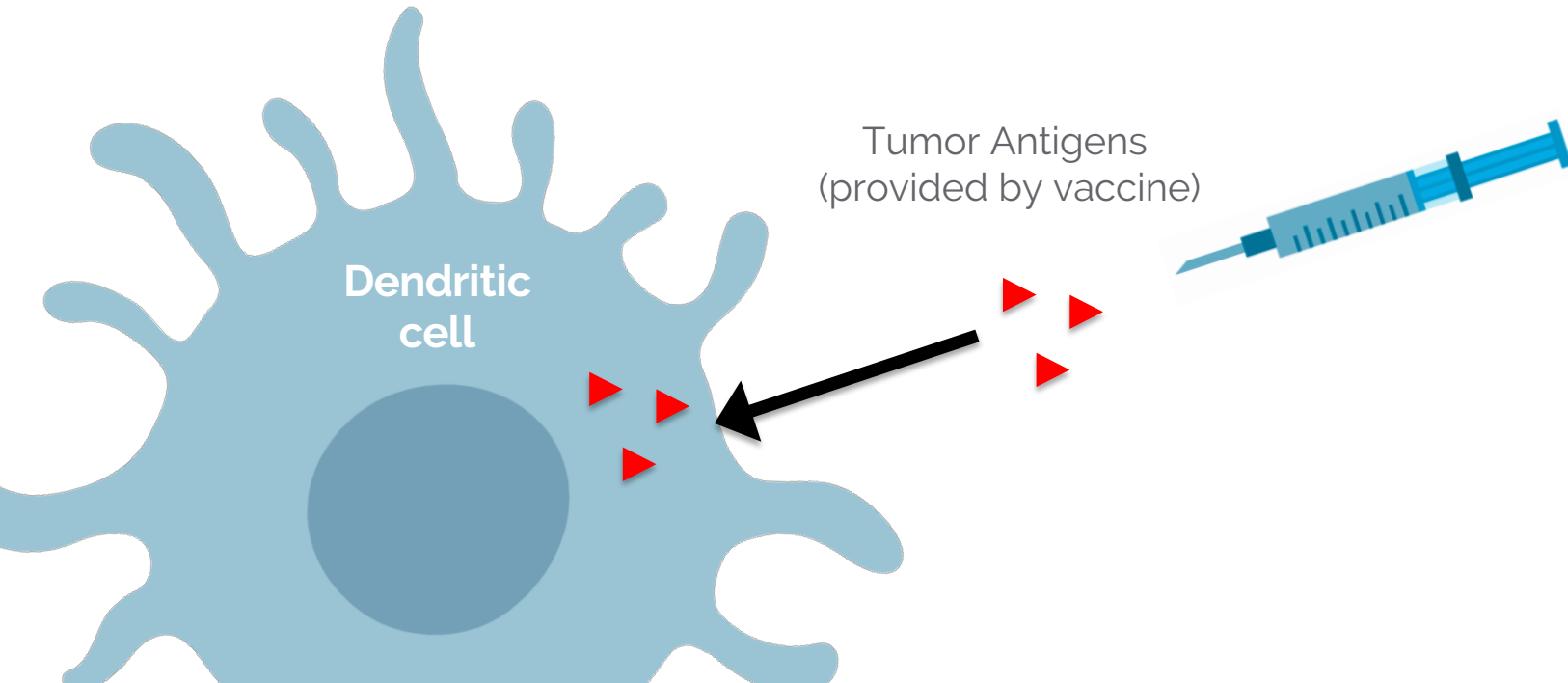
Cancer Vaccines

65
YEARS IN
WORLDWIDE

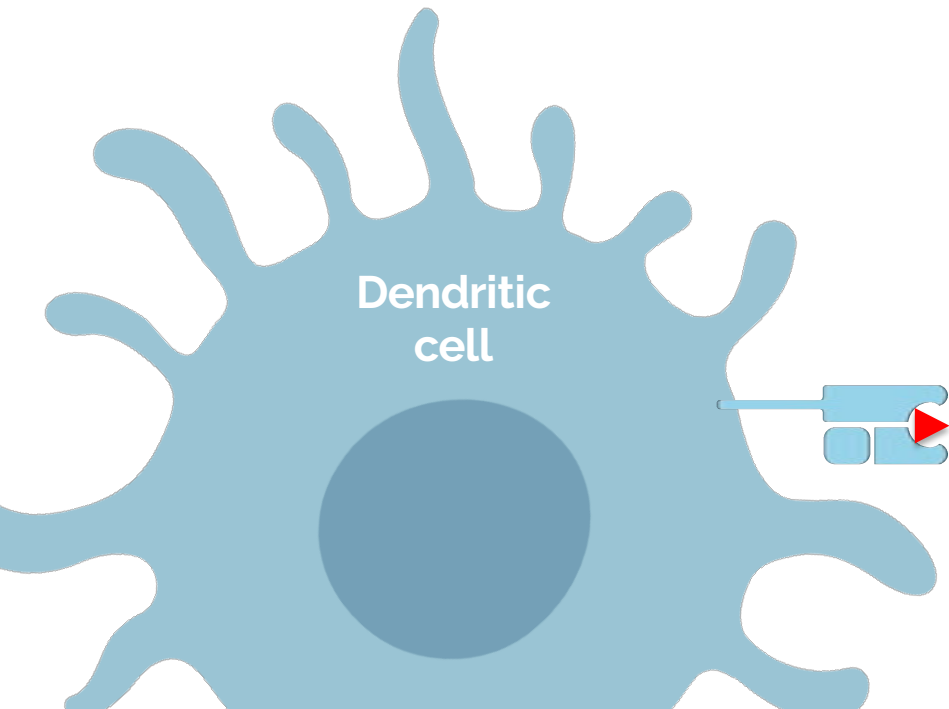
Tumor Antigens
(provided by vaccine)



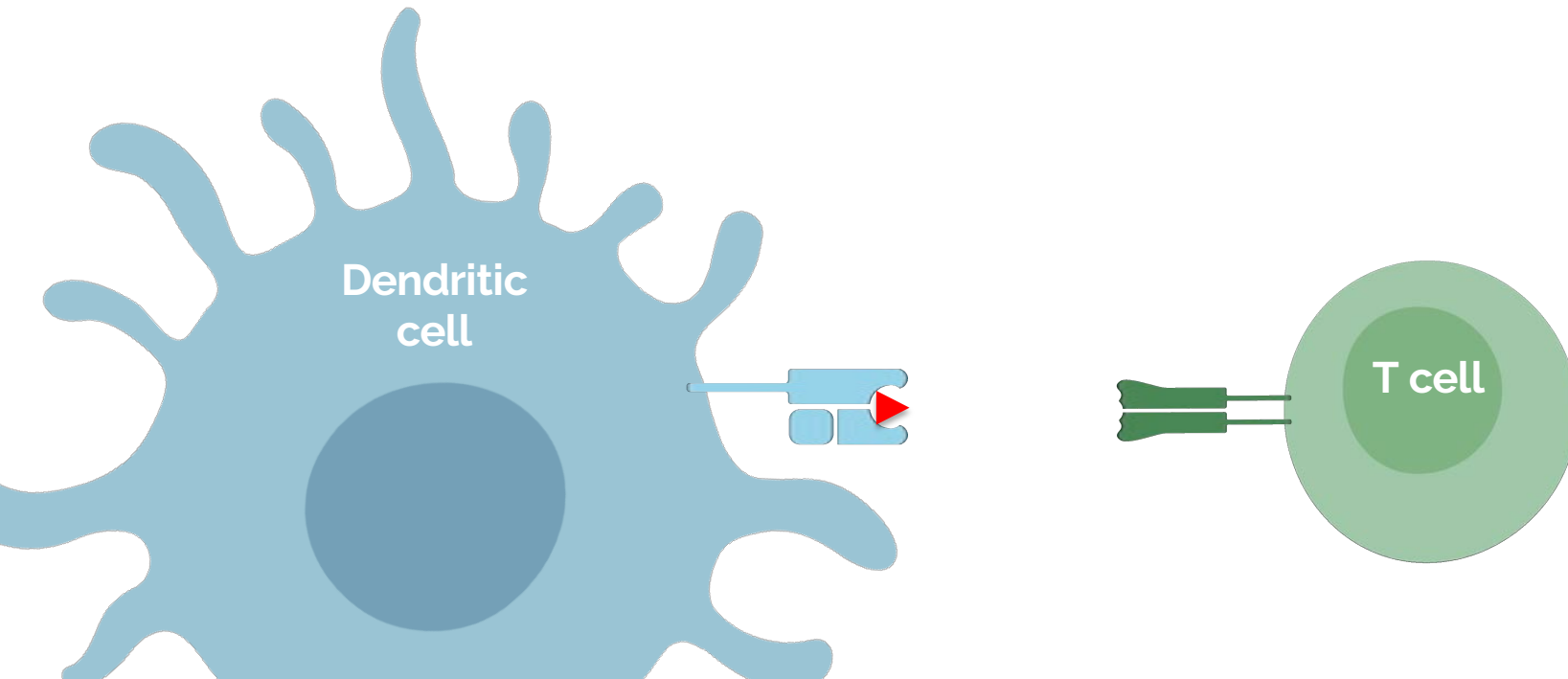
Cancer Vaccines

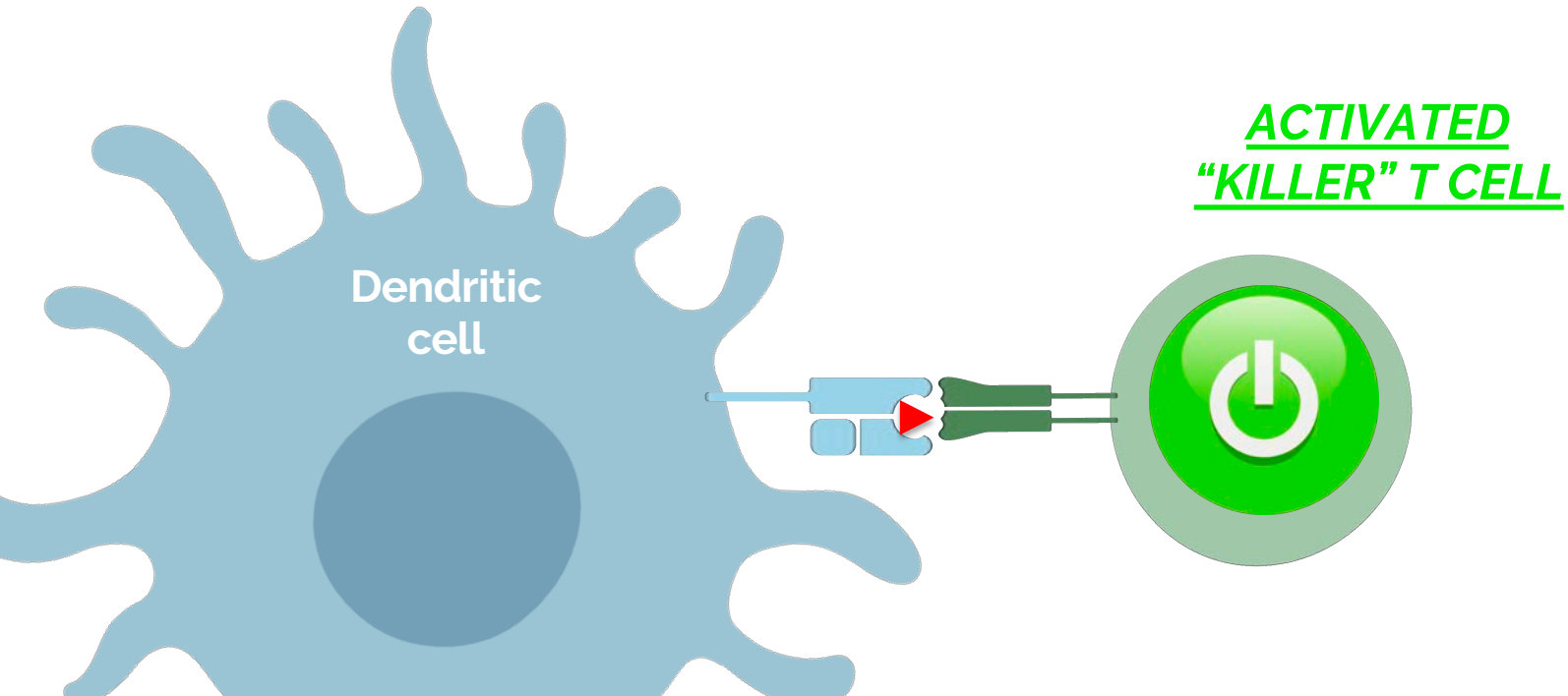


Cancer Vaccines



Cancer Vaccines



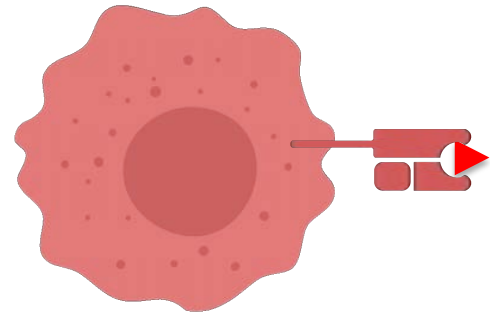


Vaccine-Induced Elimination of Cancer Cells

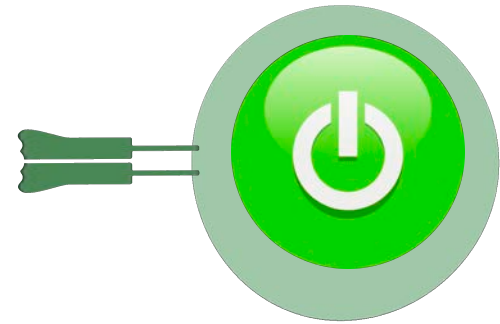
CR
YEARS IN
RESEARCH



Cancer Cell

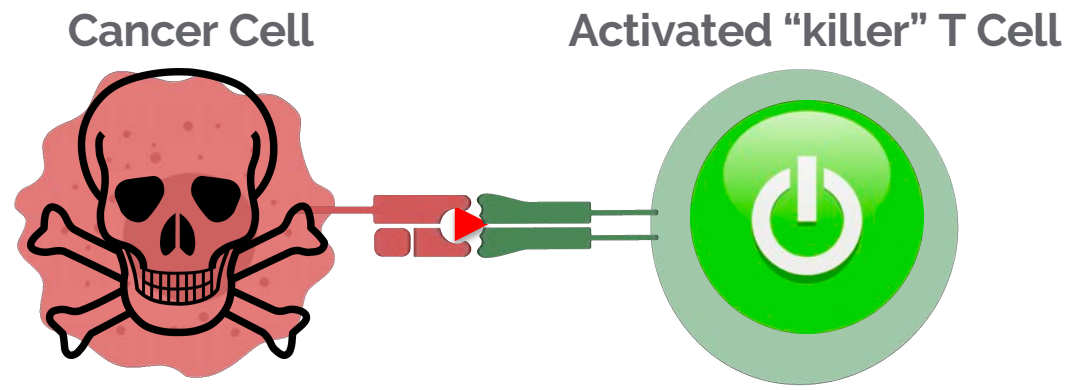


Activated "killer" T Cell

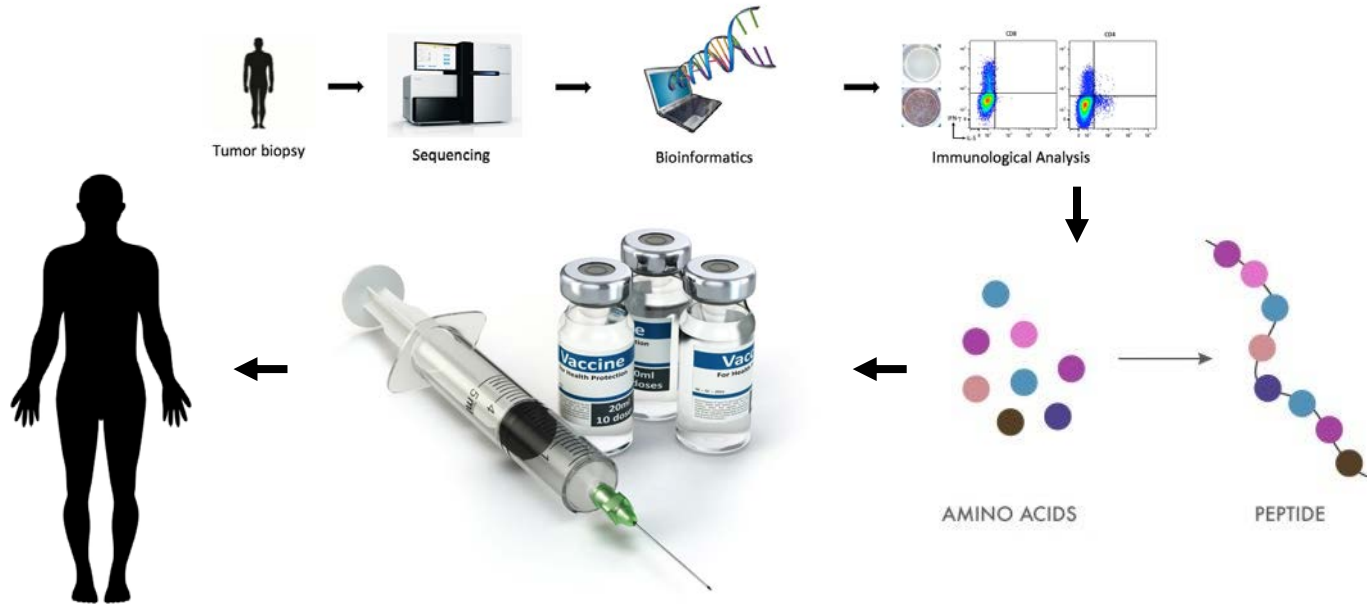


Vaccine-Induced Elimination of Cancer Cells

CELLS
YEARS 17
WILLIAM BAKER



Personalized Neoantigen Vaccine Trial



Challenges in Cancer Immunotherapy

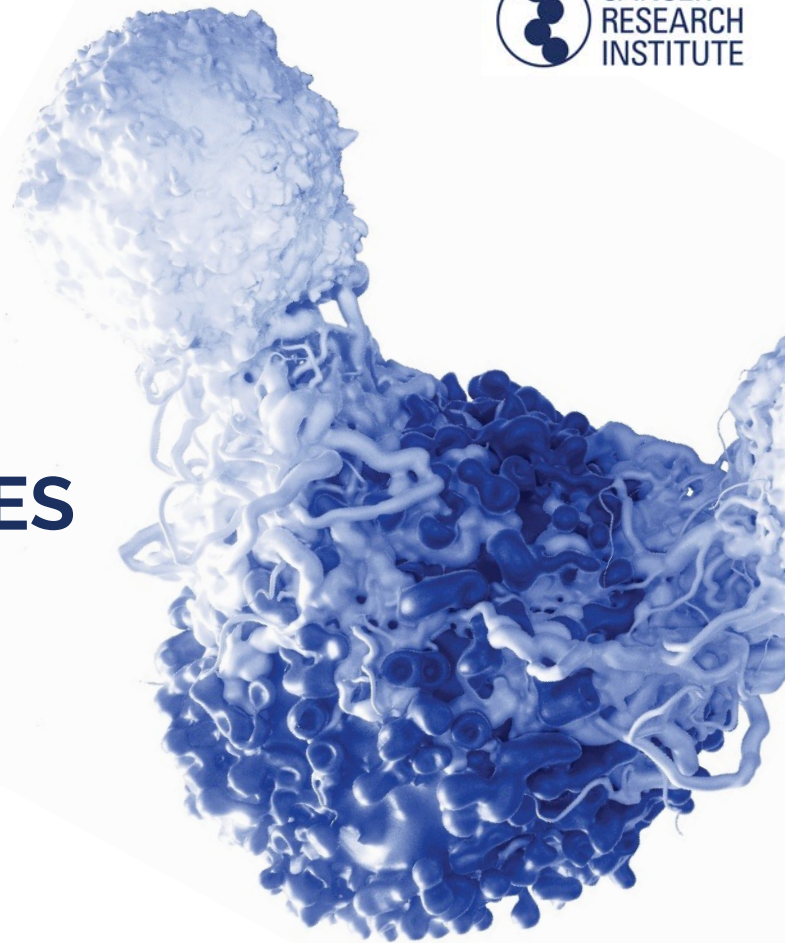
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YEARS IN
RESEARCH



- Discovering and validating new biomarkers to help doctors predict which patients will respond to which immunotherapies
- Determining the best way to combine immunotherapies with each other as well other treatments to extend immunotherapy's benefits for more patients
- Learning how to decouple side effects of immunotherapy from benefit

Panel Discussion

LATEST RESEARCH UPDATES



Moderator

Aaron M. Miller, M.D., Ph.D.

Panel

Tanya B. Dorff, M.D.

Prostate Cancer

Roger S. Lo, M.D.

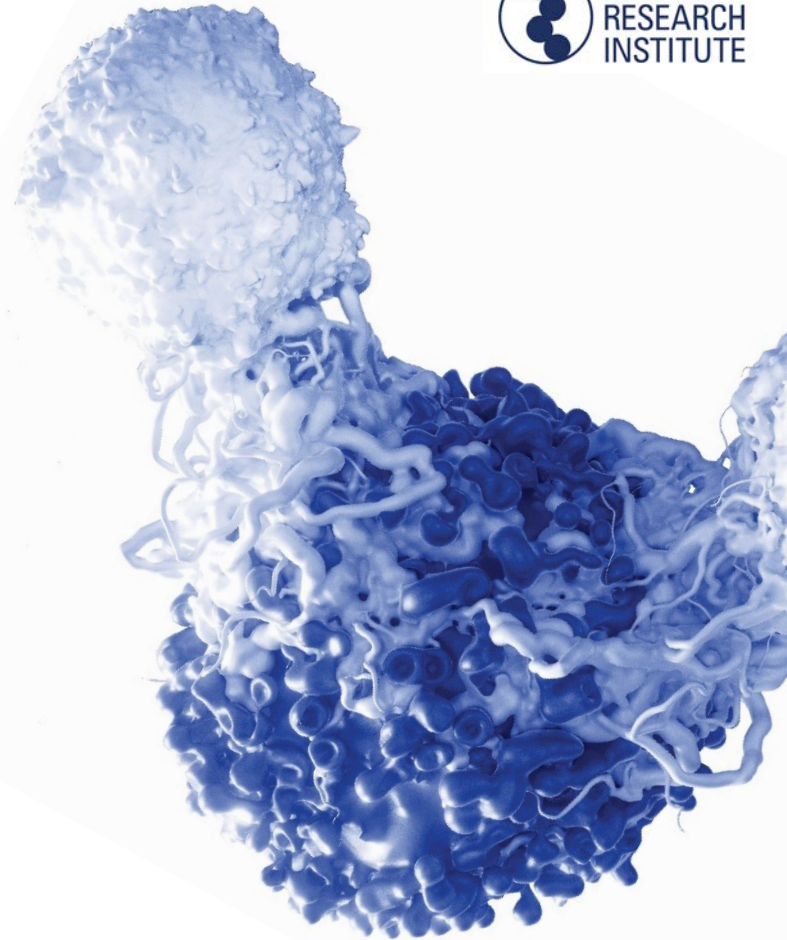
Melanoma

Rebecca A. Shatsky, M.D.

Breast Cancer

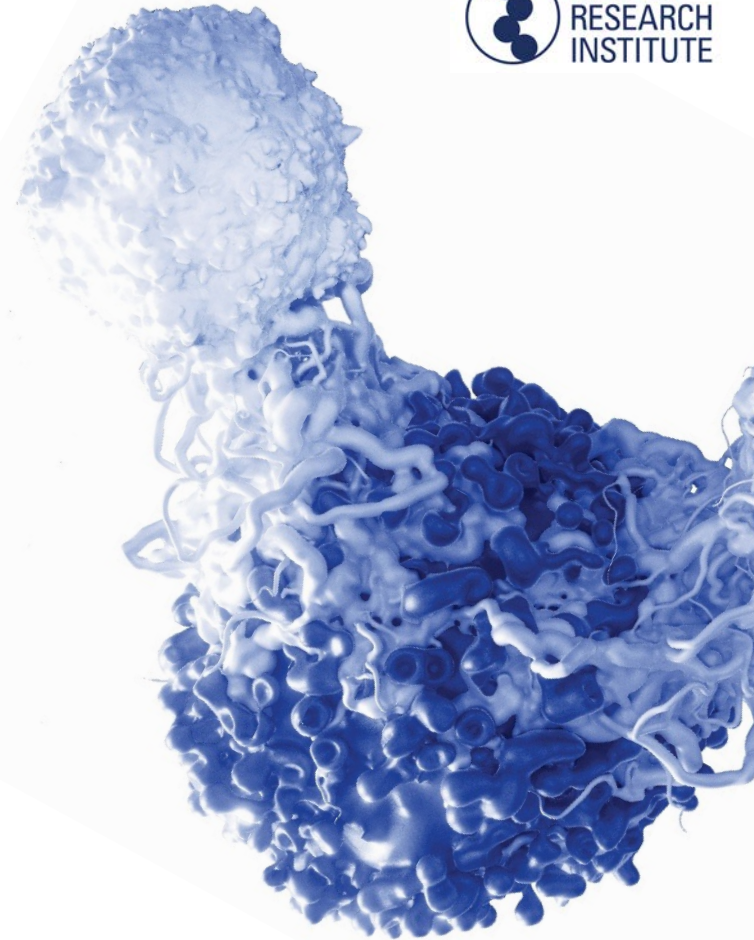
Janie Ferling
Surviving Melanoma

PATIENT PERSPECTIVE



Lunch and Networking

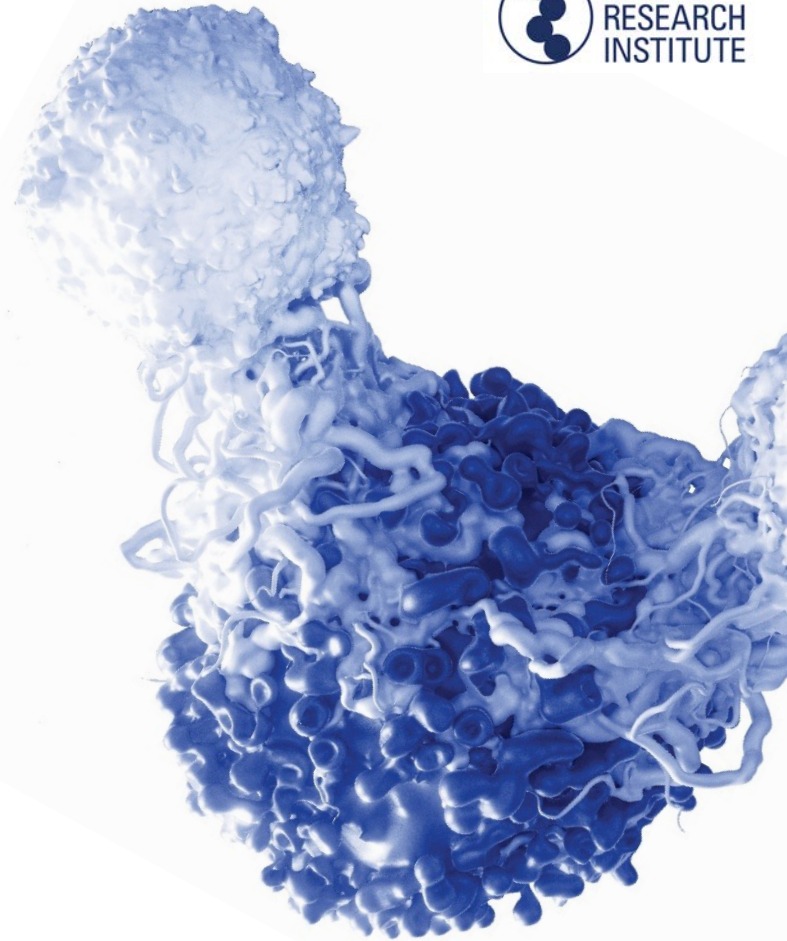
Level 1 | Room 141/143/145



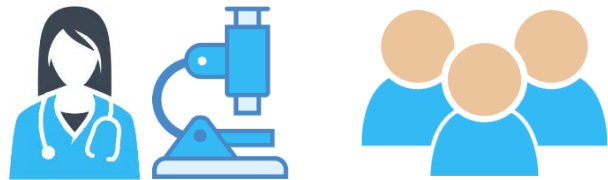
Brian Brewer

Cancer Research Institute

LEARN ABOUT CLINICAL TRIALS

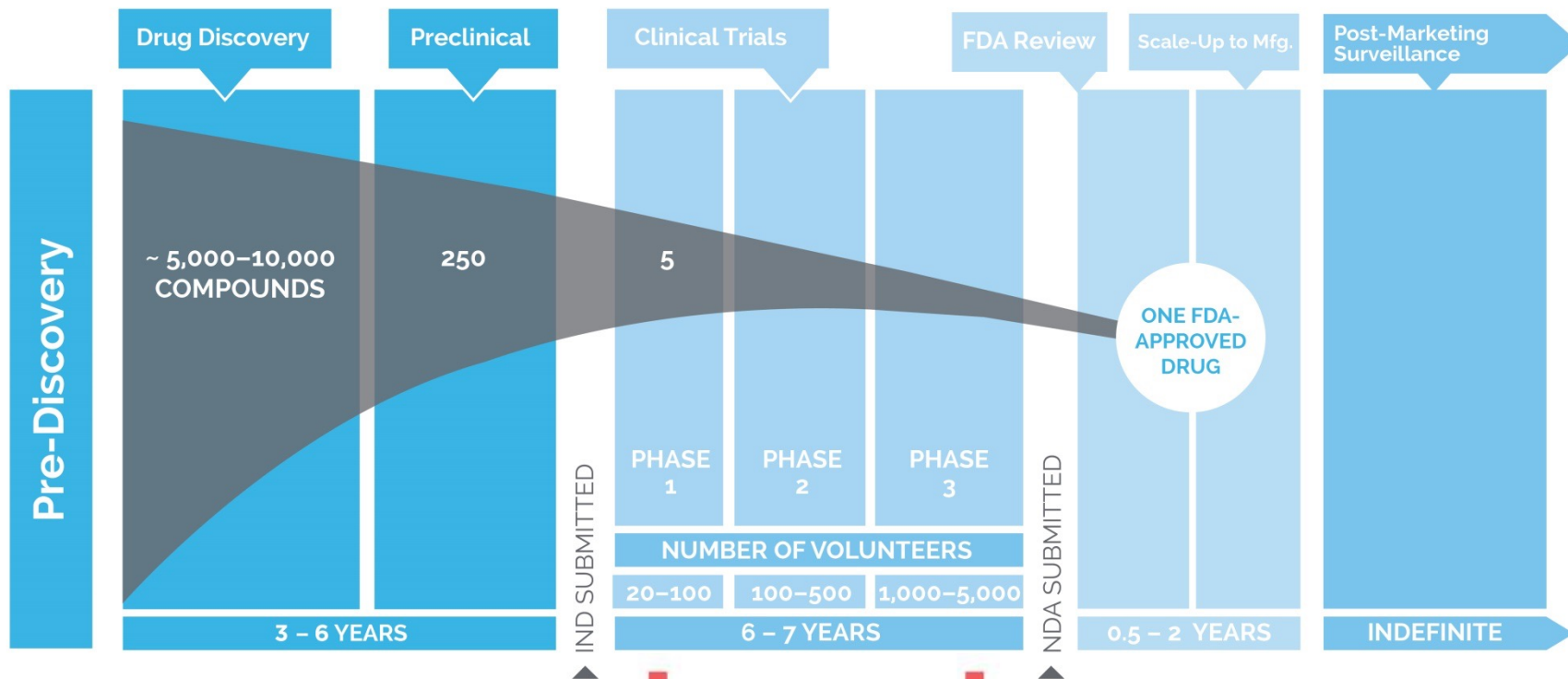


What Are Clinical Trials?



- Research studies that involve people
- Designed to answer specific questions about new and existing treatments
- Aim to improve treatments and the quality of life for people with disease

Getting from Discovery to Approval



What Are Clinical Trial Phases?

Phase 1



Is the treatment safe?

Purpose:

- First study in humans
- Find best dose, delivery method, and schedule
- Monitor for side effects
- Determine safety

Number of people: 20-100

Phase 2



Does it work?

Purpose:

- Look for effect on specific type(s) of cancer
- Continue monitoring for side effects and safety

Number of people: 100-500

Phase 3



Does it work better?

Purpose:

- Compare new treatment (or new use of a treatment) with current standard treatment
- Determine risk vs. benefit

Number of people: 1,000-5k+

Pros and Cons of Clinical Trials



Potential Advantages	Potential Disadvantages
Access to best possible care	Unknown side effects or risks
Receiving new drugs before they're widely available	Unknown benefits—drugs may not work as intended
Close monitoring by medical team	Not all patients may benefit
Chance to play active role in healthcare and research	Frequent tests and clinic visits
Help future generations	Possible need to travel to trial sites

Patient Resource, "Understanding Clinical Trials: A Guide for Patients and Their Families"

Questions to Ask Before Volunteering



- Why is this trial being done?
- Why is it believed that the treatment being studied may be better than the standard treatment?
- What are my other options (standard treatments, other trials)?
- How did patients do in any previous studies of this treatment?
- How will the doctor know if treatment is working?
- How long will the trial last?

Questions to Ask Before Volunteering



- Can I continue to receive this treatment after the trial ends?
- What kinds of procedures or tests are involved?
- What impact with the trial have on my daily life?
- Will I have to travel for treatment? Will I be compensated?
- How often will I need to travel to receive treatment?
- Will I be hospitalized as part of the trial?
- What costs (if any) will be my responsibility to pay?

Getting into a Clinical Trial Isn't Always a Given



Trials are designed to ask specific questions, and must adhere strictly to entry criteria to ensure data is accurate and meaningful.

This also helps ensure patients who could be made worse by treatment are not exposed to the risk.

Common criteria include:

- **cancer type or stage**
- **treatment history**
- **genetic factors**
- **age**
- **medical history**
- **current health status**



I might only get placebo
("sugar pill") instead of treatment.



Placebos are rarely used and never given
in the absence of some form of treatment.



Trials are only for people who have run out of treatment options (a “last resort”).



Clinical trials are designed for people with cancer of all types and stages.



I need to travel to a large hospital or cancer center to participate in a clinical trial.



Trials take place at local hospitals, cancer centers, and doctors' offices in all parts of the country, in both urban and rural areas.



My health insurance doesn't cover the cost of care in a clinical trial.



Doctor visits, hospital stays, and certain testing procedures may be covered by insurance. Research costs are typically covered by the trial sponsor.

Clinical Trials: Myth versus Fact



Signing a consent form “locks” me into staying in a trial.



Fact: You are free to change your mind for any reason about participating in a trial anytime before or during a trial.



I will be made to feel like a
“guinea pig” experiment.



Fact: The overwhelming majority of trial participants say they were treated with dignity and respect, and report having had a positive experience in a trial.

Clinical Trials: Myth versus Fact



MYTH

Clinical trials aren't safe.

FACT

Fact: Safeguards including an Institutional Review Board, Data and Safety Monitoring Board, and an ongoing informed consent process ensure patients' rights and safety are protected.

Informed consent = having all the facts before and during a trial

- Study purpose
- Length of time of the study
- Predictable risks
- Possible benefits
- Expectations
- Patient's rights
- Treatment alternatives
- Patient health monitoring
- Safeguards in place
- How to withdraw from study

**Be bold in asking for details.
It's YOUR treatment plan.**

How Can I Find a Clinical Trial?

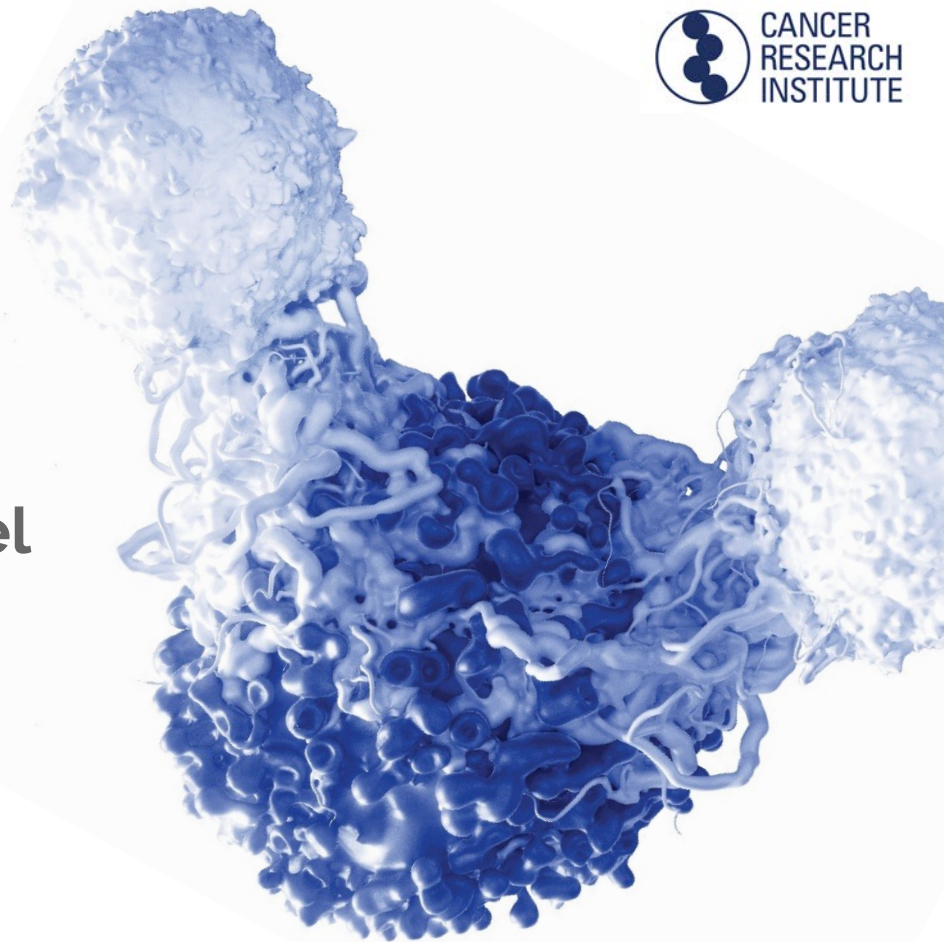


- Ask your doctor
- Ask another doctor if necessary...
- Contact a patient advocacy organization
 - Seek assistance from a clinical trial navigator, if offered
 - CRI Clinical Trial Finder: 1 (855) 216-0127
- Search online
 - <https://www.cancerresearch.org/patients/clinical-trials>
 - <https://clinicaltrials.gov/>



Panel Discussion

Immunotherapy Patient Panel



Moderator

Brian Brewer

Panel

Dan Engel

Melanoma

Janie Ferling

Melanoma

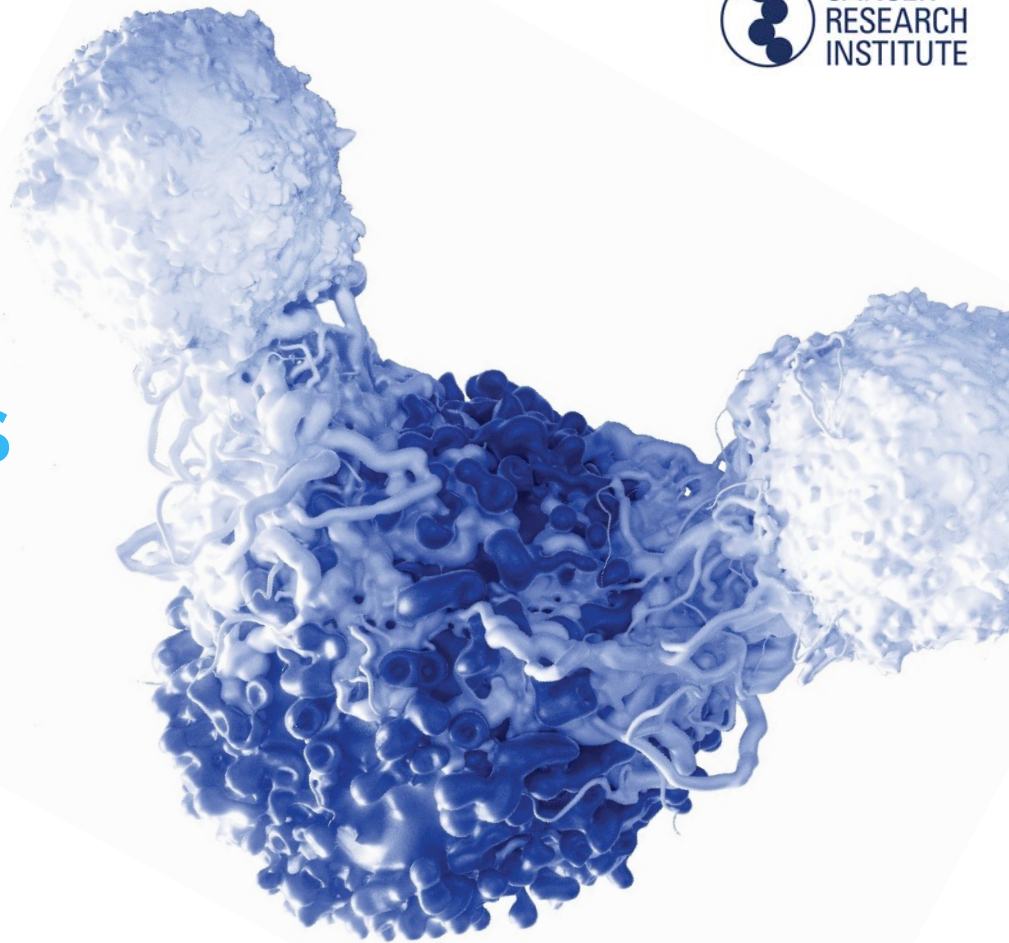
Gina Ferreira

Non-Hodgkin lymphoma

Gordon Levine

Colorectal Cancer

BREAKOUT SESSIONS



Breakout Session Rooms



General Immunotherapy

Aaron M. Miller, M.D., Ph.D.

Level 1

Auditorium

Breast Cancer

Rebecca A. Shatsky, M.D.

Level 1

Room 141/143/145

Melanoma

Roger S. Lo M.D.

Level 2

Room 215

Prostate Cancer

Tanya B. Dorff, M.D.

Level 2

Room 223

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Thank you to those who helped promote the summit

- Addario Lung Cancer Foundation
- All of Us Research Program UCSD
- American Cancer Society
- Crush it for Curtis Foundation
- Colorectal Cancer Alliance
- FORCE
- Imerman Angels
- Latinas Contra Cancer
- Leukemia & Lymphoma Society
- LUNGevity
- Michelle's Place
- Moores Cancer Center at UC San Diego Health
- Pancreatic Cancer Action Network
- Patient Empowerment Network
- Rotary International
- San Diego Center for Precision Immunotherapy
- Sharp Center for Research
- Us TOO
- Young Survival Coalition

Thank You!



You will receive two emails after the summit:

1. **A survey** to share your feedback on the summit as well as insights into future programming.
2. **Information** from the Summit day, including this presentation and instructions on how to use our [Clinical Trial Finder service](#).



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