

Let's end cancer.

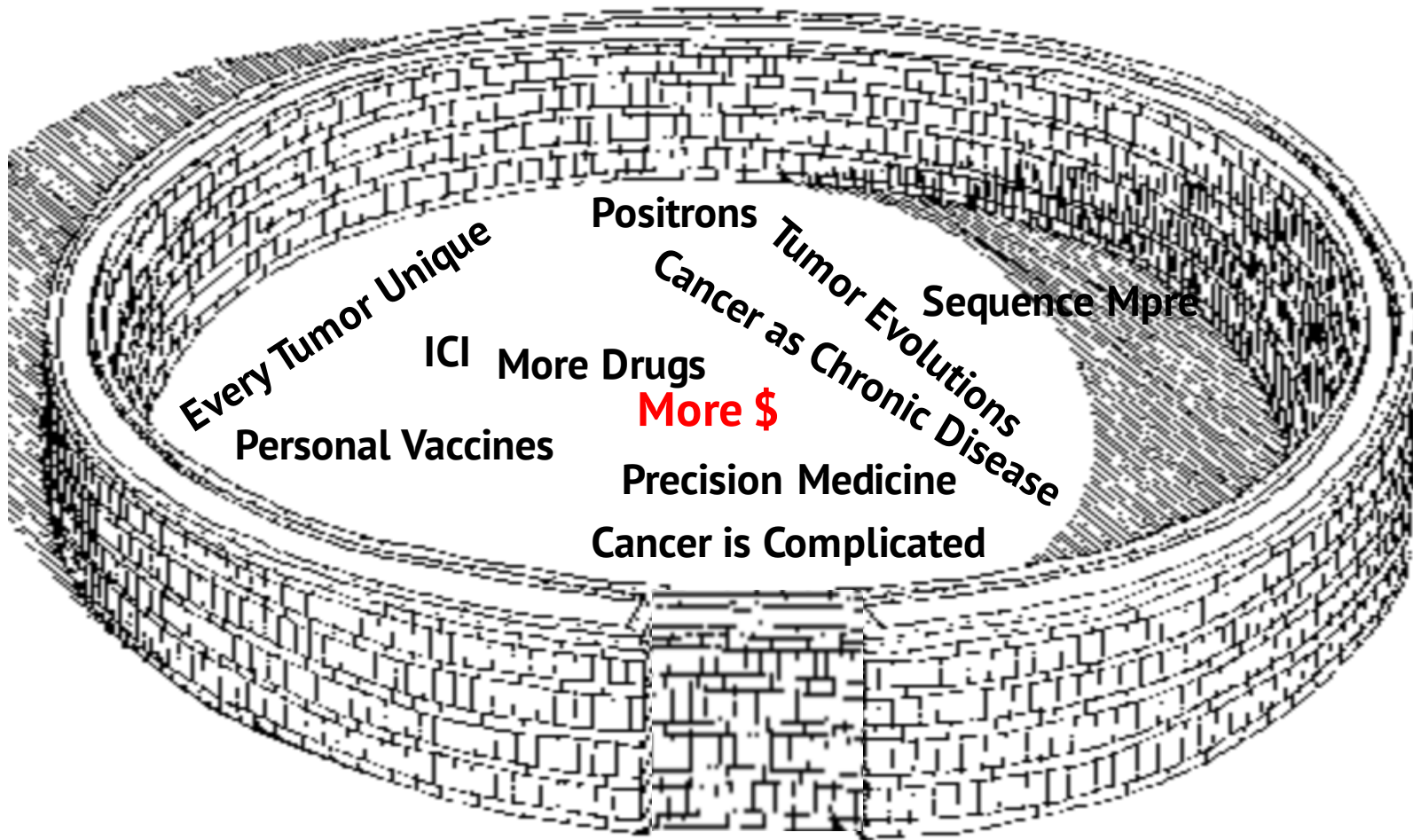


Healthcare & Pharmaceuticals

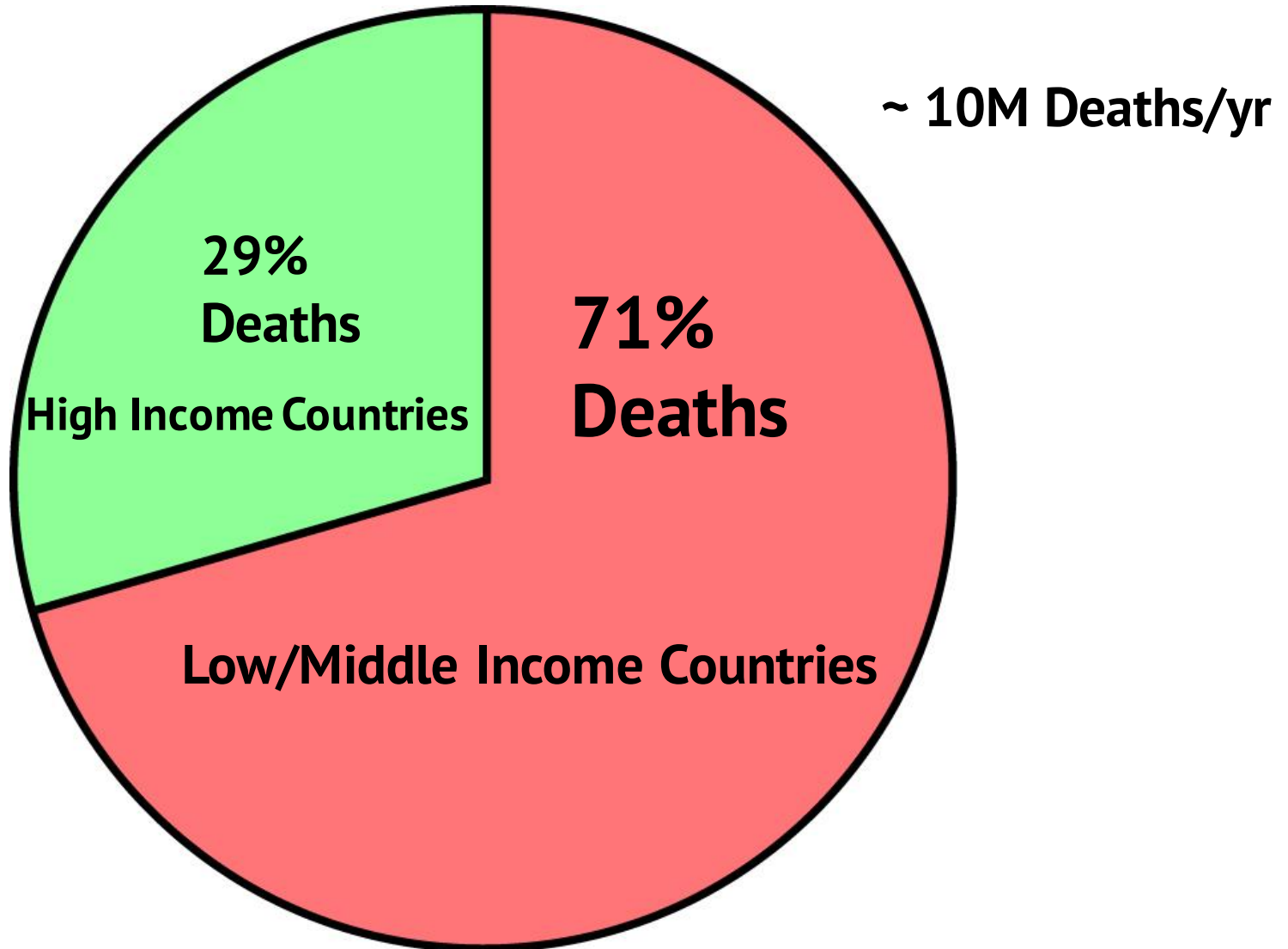
AstraZeneca shares fall as lung cancer drug trial data abstract disappoints

- **\$2B Spend on Developing the Drug**
- **Clinical Goal Was 1.5 -2 Months Life Extension**
- **Only Saw 0.7 Months.**

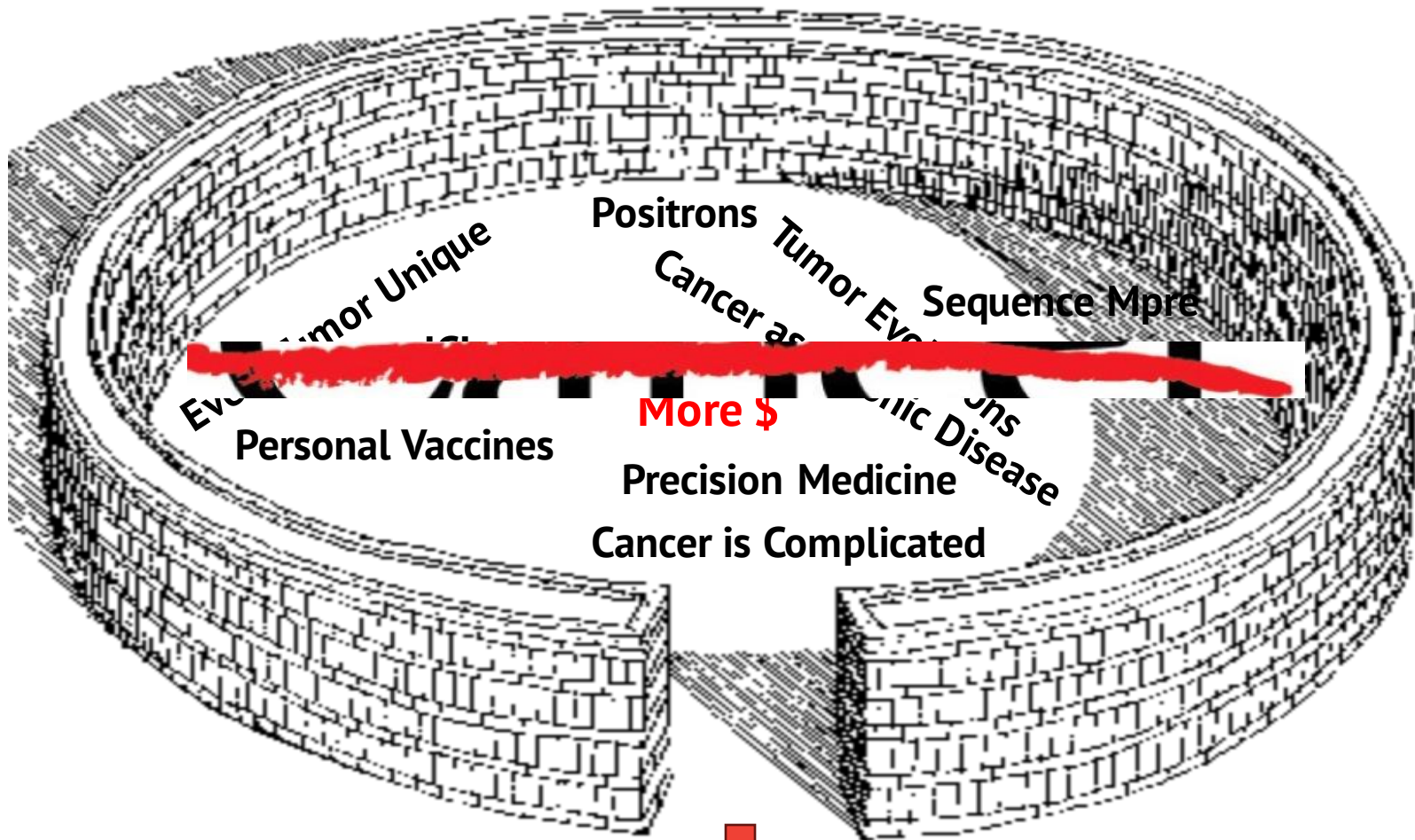
The Cancer Effort as Evidence of Godel's Incompleteness Theorem



Cancer Should Be Addressed WORLD WIDE



Let's Focus on Preventing Cancer



**Broadly Preventative
Cancer Vaccine**

Ultimate Solution



A Vaccine to PREVENT Cancer in the First Place

Treat Cancer Like an Infectious Disease

**..To boldly Gogh where
no van has Goghged before...**

Specifications For a Preventative Cancer Vaccine:

1. Immunogenic NeoAntigens

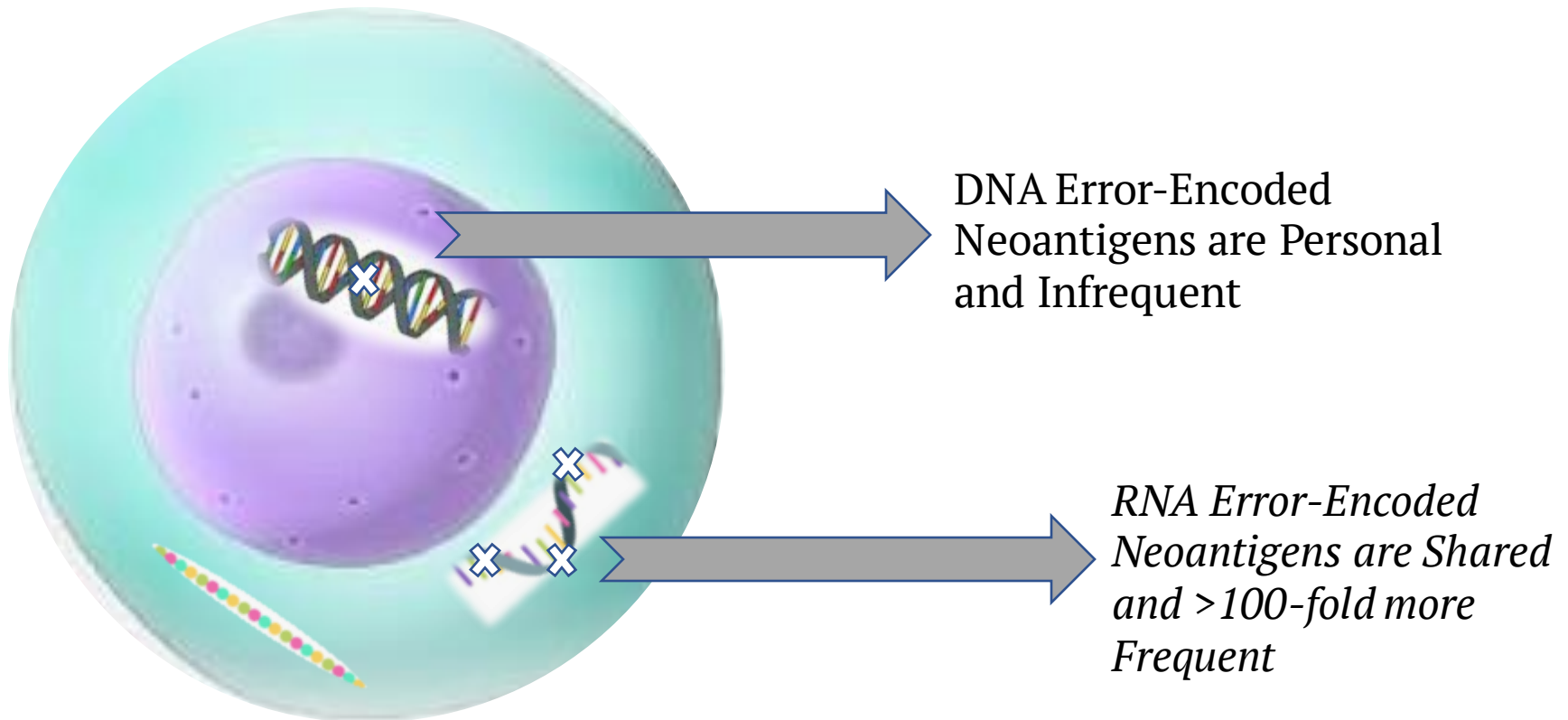
Self antigens have largely failed for 30 years.

2. Shared NeoAntigens

> 10% frequency across tumor types and patients

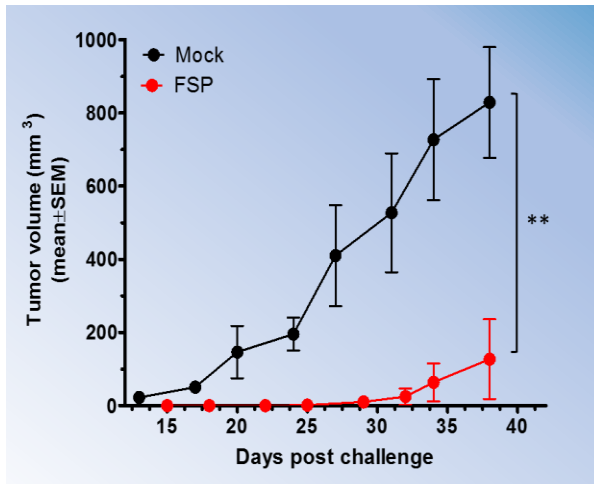
Discovery: RNA-Error Derived Neoantigens (REDN)

Tumor cell

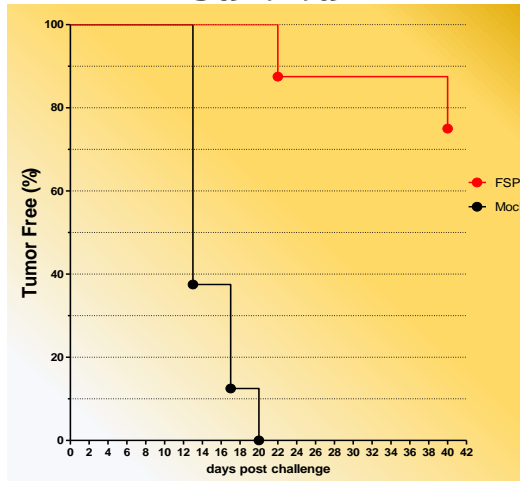


Our Pre-Clinical, Published Studies Show REDNs are Shared and Protective in Cancer Models

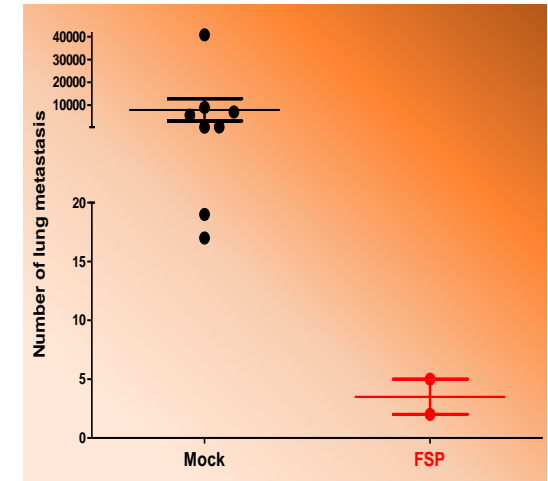
Slow Tumor Growth



Increase Tumor-Free Survival



Prevent Metastasis



A pool of 3 shared REDNs (FSP) protect in 2 different mouse models of cancer

Challenge:

*To Create Off the Shelf Therapeutic and Preventative Vaccines and Diagnostics, thousands of tumor samples would need to be screened to identify those REDNs that are **Broadly Shared and Immunogenic***

Calviri has Bioinformatically PREDICTED All REDNs that Human and Dog Tumors Can Produce

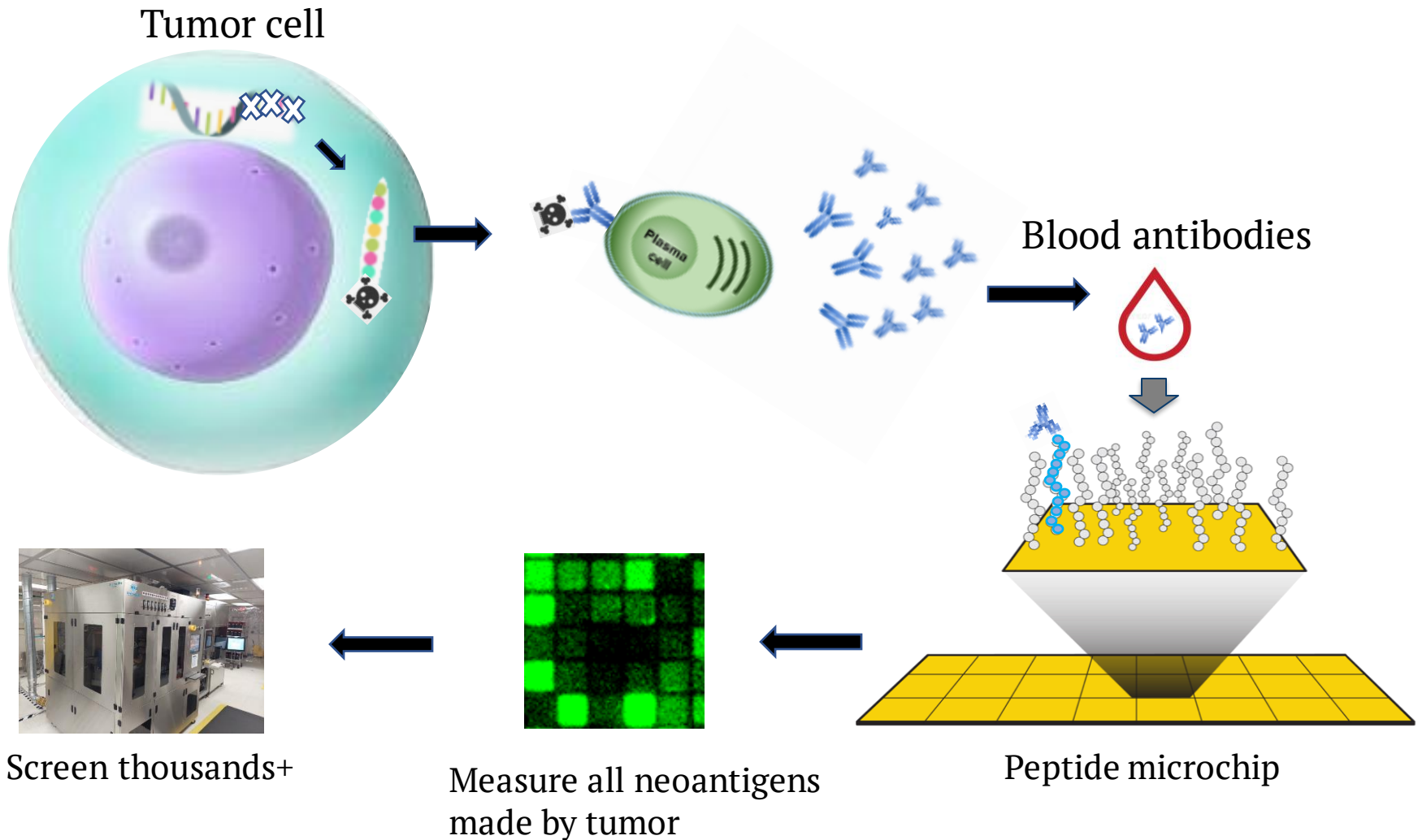
Predicted FSNs In Tumors designed as 14-mer FSPs

- Microsatellite-transcription slipping 22,367
 - Exon Mis-Splicing and exon 1 mis-initiation 1,171,149
 - Intron Retention 1,244,416
 - W-Bumps 445,583
 - Non-Coding RNAs (Dark proteome) 161,899
- Only a small % of each class will be *expressed* and *immunogenic*

There are ~2.1M Human, 1.4M Dog Predicted REDNs

The Challenge:
Find the REDNs Useful For Vaccines and Diagnostics

REDNs Elicit Antibodies that can be Measured on Our Peptide Microchips—Enabling Searches of REDN Space



There Was Little Support For The Effort

Published quote from a prominent oncologist on our efforts:

“It’s biologically impossible. It’s fantasyland. It goes against everything we know today about what cancer is.”

Editorial in Nature on our efforts: We “should stop our work”

THIS WEEK

EDITORIALS	IMPASSE IN BRUSSELS Why the budget talks are so difficult for research p.6-8	WORLD VIEW The US fiscal cliff: a serious situation looks p.5-6	SLOW TAKE-OFF Weak feathers hampered early birds p.6-11
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Misguided cancer goal

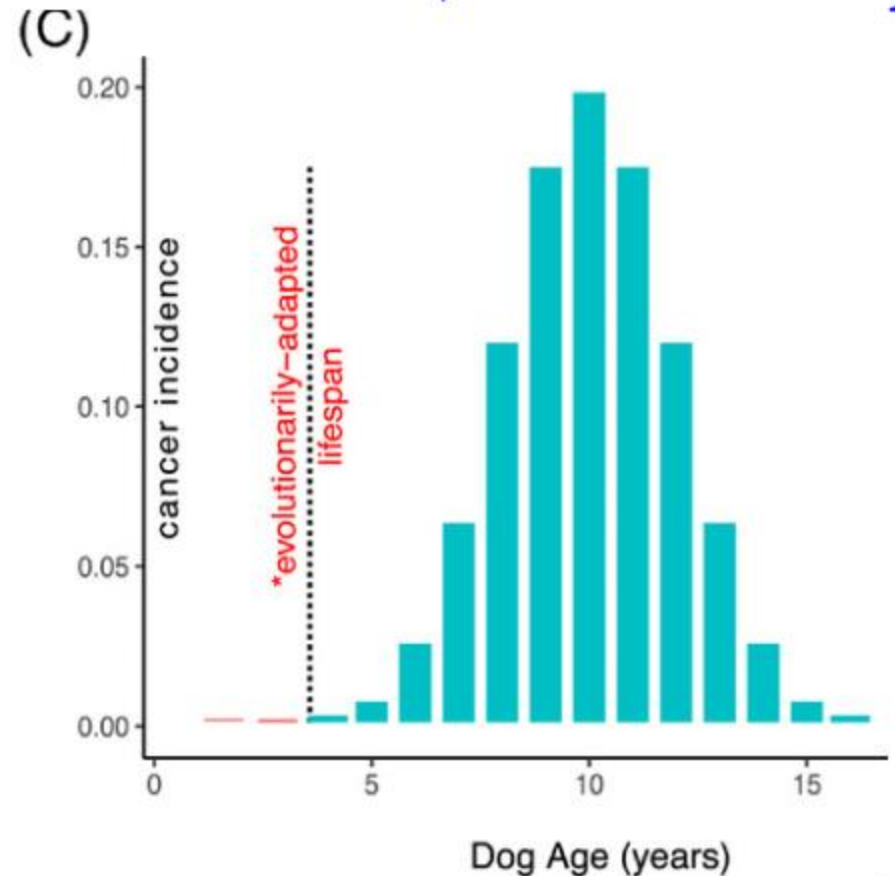
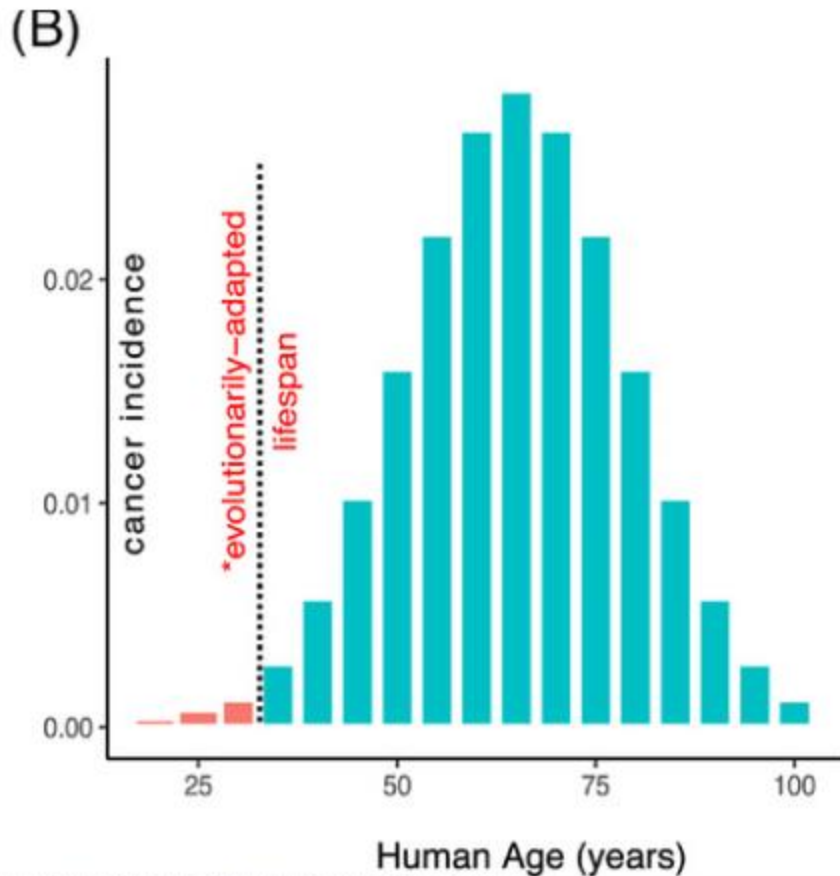
An influential US advocacy group has set a deadline to beat breast cancer by 2020. But it puts public trust at risk by promising an objective that science cannot yet deliver.

Dogs Trials Accelerate Human Trial Milestones and Generate Early Revenue

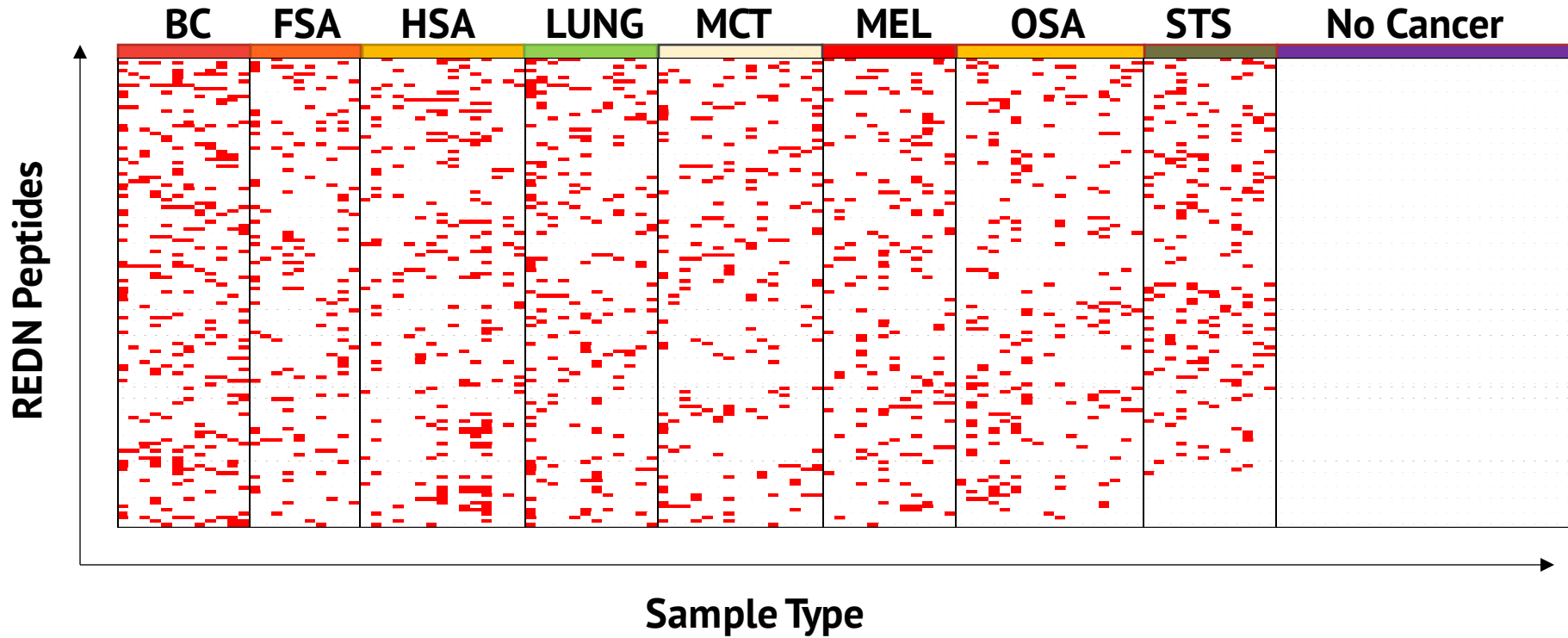
*Dogs are not models for cancer,
They are just different kinds of humans*



Incidence of Cancer by Age: Dogs vs Humans



Screen of Cancer versus No Cancer Sera for *Shared* REDN Peptides



220,00 REDNs Screened

Total 127 REDNs(>10% positive rate, 6SD)

→ 37 Chosen for Vaccine

Calviri is Testing a Vaccine to PREVENT Cancer in the World's Largest Dog Cancer Trial

Largest Canine Cancer Trial

- Calviri is conducting the world's largest study, Vaccine Against Canine Cancer Study (VACCS) among 800+ dogs
- We are in the 5th year of the 5 year trial

All major cancers

Objective is to test the efficacy (over 5 years) of a preventative vaccine against the 8 most common cancers in a double blind, equal arms study

\$7.4 million

Study funded by a \$6.4M non-dilutive grant from Open Philanthropy Project and \$1M Calviri, Inc.

800 dogs

- 804 Dogs Fully Enrolled
- **No Vaccine Safety Issue**
- Possible extension to 6 years

Clinical research sites



COLLEGE OF VETERINARY MEDICINE
AND BIOMEDICAL SCIENCES
COLORADO STATE UNIVERSITY



FLINT ANIMAL
CANCER CENTER
COLORADO STATE UNIVERSITY



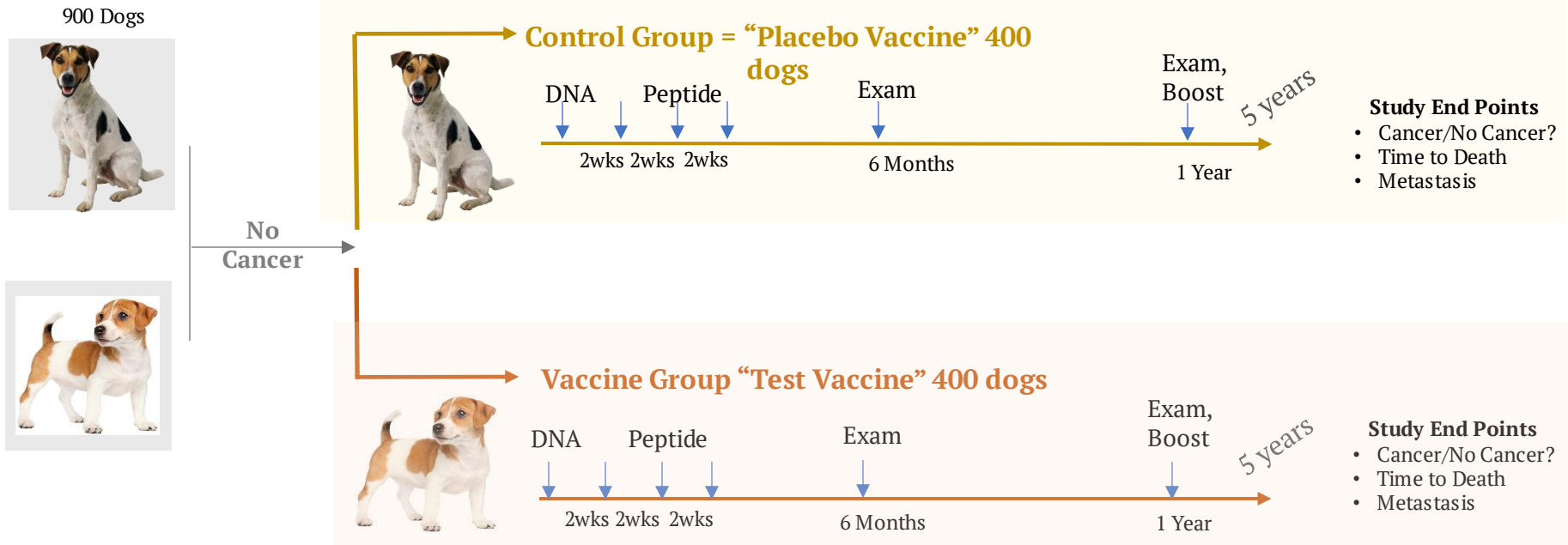
UC DAVIS
VETERINARY MEDICINE



SCHOOL OF VETERINARY MEDICINE
Advancing animal and human health with science and compassion



VACCS Trial Design Blinded to Owners and Clinical Sites



Enrollment Criteria:

- 5-11 yro
- No prior cancer
- Documents of yearly checkup
- Low cancer incidence breeds excluded
- < 150 miles from clinical sites



Going through the sound barrier

OF CANCER

VACCS Preventative Cancer Vaccine Trial Tumor Unofficial Results to Date

	Placebo	Vaccine Responders	Chi Square p value
Tumor Incidence	85	30	16 0.0001
Tumor Deaths	29	10	9.2 0.002

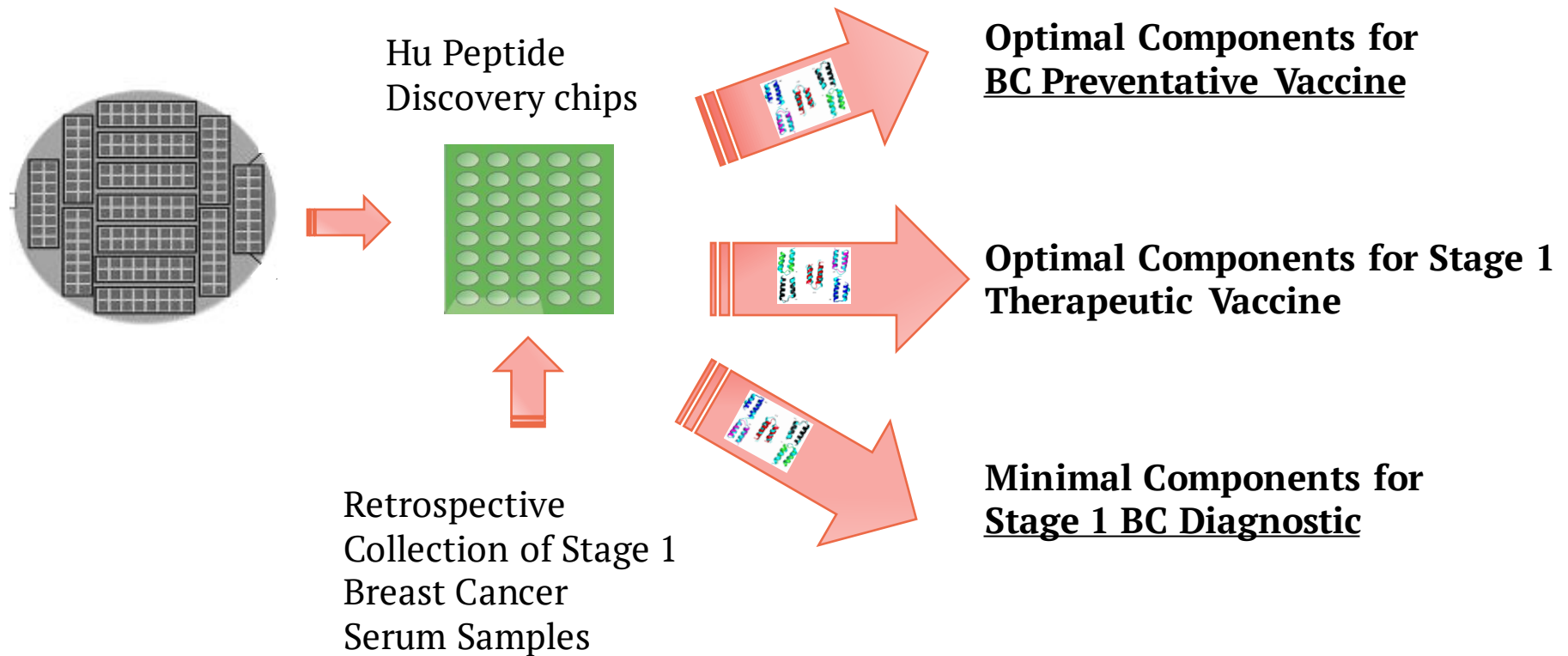
60%
Reduction in
Tumors and
Tumor Deaths
In Vaccine Take
Dogs

Conclusions:

- *A Vaccine Can Prevent Cancer Incidence and Death*
- **Improvements can be Made to Components and Delivery Method to Increase Vaccine Takes**

Human Preventative Breast Cancer Vaccine Design

**Mask Sets for Libraries:
Human 2.1M neoantigen peptides**



What YOU Can Do:

- 1. If you meet people in the Cancer Community ask about the preventative vaccine and what they are doing about it.**
- 2. Inform political representatives at all levels**
- 3. Confront anyone in Big Pharma about why they are not trying to PREVENT cancer.**

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