

The challenge of cancer and the LaRC vision

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March 11, 2015

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Suffering and death



(Grove)

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It does not have to be this way

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Untapped opportunities

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Untapped opportunities

LaRC is one such vision

Outline

- Cancer statistics
- Patient treatment trajectory
- What could be different
 - How therapies reach patients
 - Untapped opportunities
- The LaRC vision

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Chances that one or more of your
10 closest ones will be **diagnosed**
with cancer in their lifetimes?

99%

73%

44%

23%



Chances that ≥ 1 will **succumb**
to cancer?

91%

66%

37%

17%



580,000

US deaths

580,000

US deaths

8,000,000

world deaths

580,000

US deaths

1,600,000

US new cases

8,000,000

world deaths

580,000

US deaths

14,000,000

New cases
world 2012

1,600,000

US new cases

8,000,000

world deaths

580,000

US deaths

14,000,000

New cases
world 2012

1,600,000

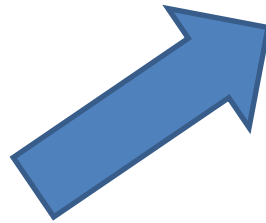
US new cases

24,000,000

New cases
world 2035

8,000,000

world deaths



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[Lisa Bonchek Adams Dies at 45: Chronicled Fight With Breast Cancer](#)

Budget Office Again Reduces Its Estimate on Cost of the Affordable Care Act



Visiting Nurses, Helping Mothers on the Margins

Some Supreme Court Justices Cite 2012 Argument Against Health Care Law as Defense for It Now



On the Case at Mount Sinai, It's Dr. Data



Nanny taxes, made easy.

Click to read more in The New York Times ▶

HEALTH

Lisa Bonchek Adams Dies at 45; Chronicled Fight With Breast Cancer

By BRUCE WEBER MARCH 9, 2015



Lisa Bonchek Adams wrote about her cancer online. Julia Arstorp

“I am waiting for test and scan results, laying low after a busy and stressful week,” Lisa Bonchek Adams wrote on her blog in 2013, one of hundreds of posts to go along with thousands of [Twitter messages](#) documenting her life after she learned she had [breast cancer](#) in 2007, when she was 37.

“Wednesday was a marathon of bloodwork, EKG, CT scans and bone scan, followed today by more bloodwork. Friday is another oncology appointment. And I still made it to the dentist on Thursday for a cleaning!”

Ms. Adams, who died on Friday at 45, wrote voluminously — on [her Facebook page](#), on the website [lisabadams.com](#) and on Twitter, where she had more than 15,000 followers — as she dealt frankly with the medical, emotional and psychological issues she confronted in her eight years of treatment.

In early 2014, she became the focus of [a controversy](#) when two newspaper columns, one by Emma Gilbey Keller in the British newspaper The Guardian, and one by her husband, Bill Keller, then of The New York Times, questioned the propriety of turning one’s mortal struggle into a public event.

Email

Share

Tweet

Then put nanny taxes on your radar.



Learn more

Care.com | HomePay

Diagnosis of cancer

Loco-regional disease



Surgery, RT, chemo, targeted Rx

5 year survival
50-95+%

Cure

Loco-regional recurrence

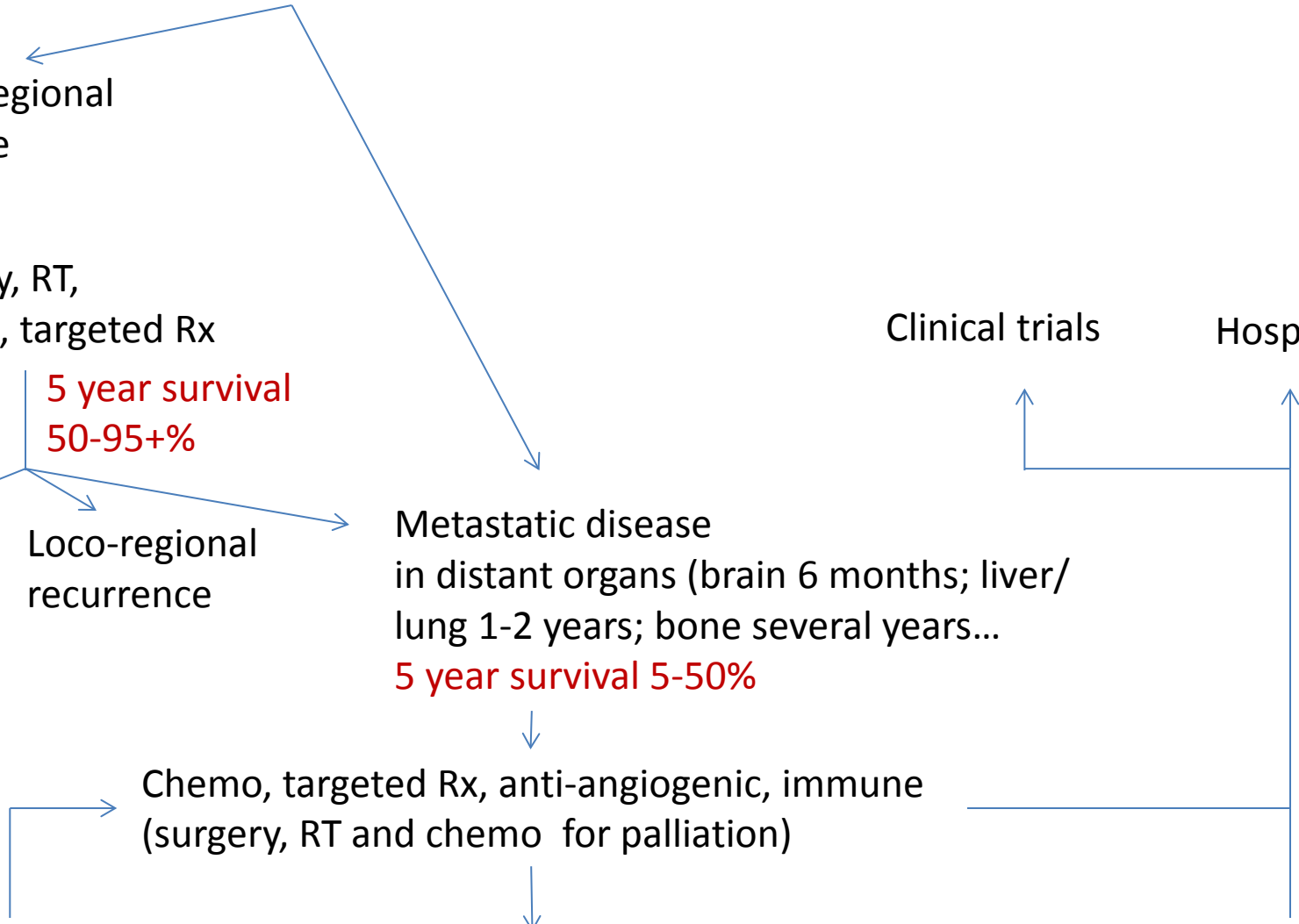
Metastatic disease
in distant organs (brain 6 months; liver/
lung 1-2 years; bone several years...
5 year survival 5-50%

Chemo, targeted Rx, anti-angiogenic, immune
(surgery, RT and chemo for palliation)

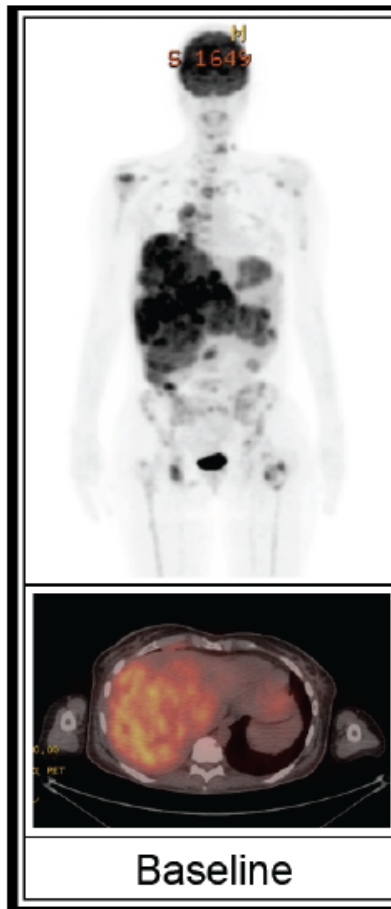
Clinical trials

Hospice

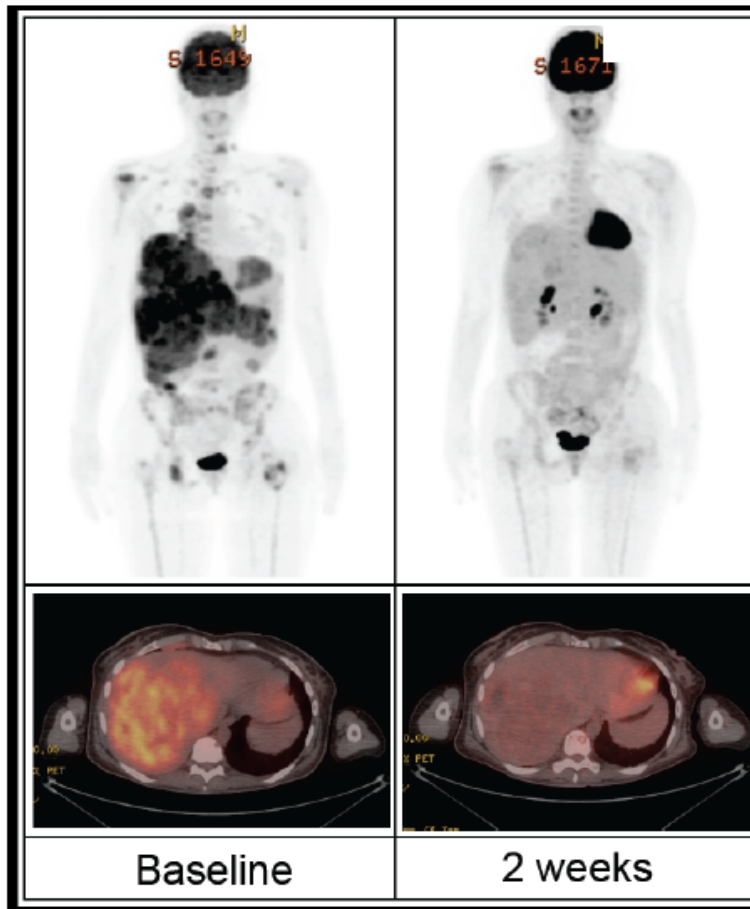
Many courses ensue (response in 1st and 2nd line 25-50%; typically for 6-12 months; 3rd and 4th line single digit response rates with duration 3-6 months)



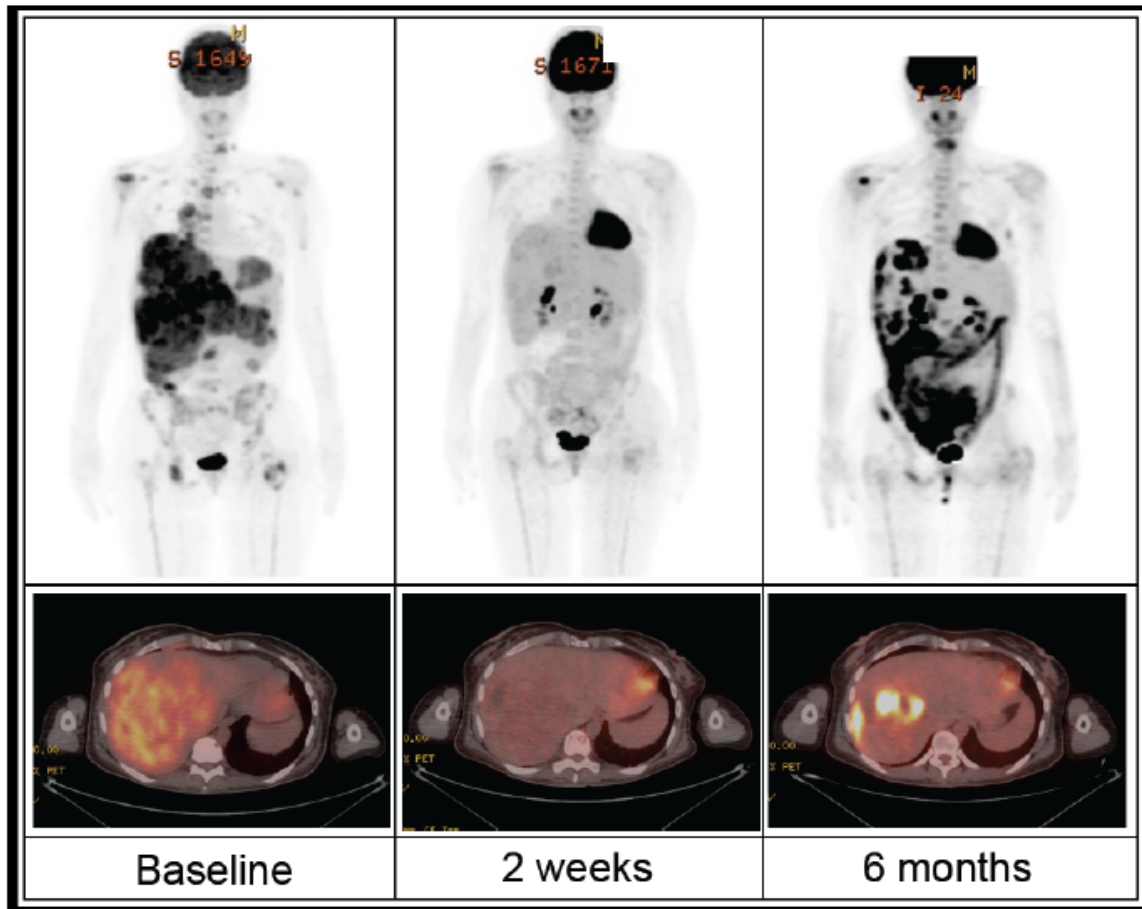
Targeted therapy for melanoma: transient response



Targeted therapy for melanoma: transient response



Targeted therapy for melanoma: transient response

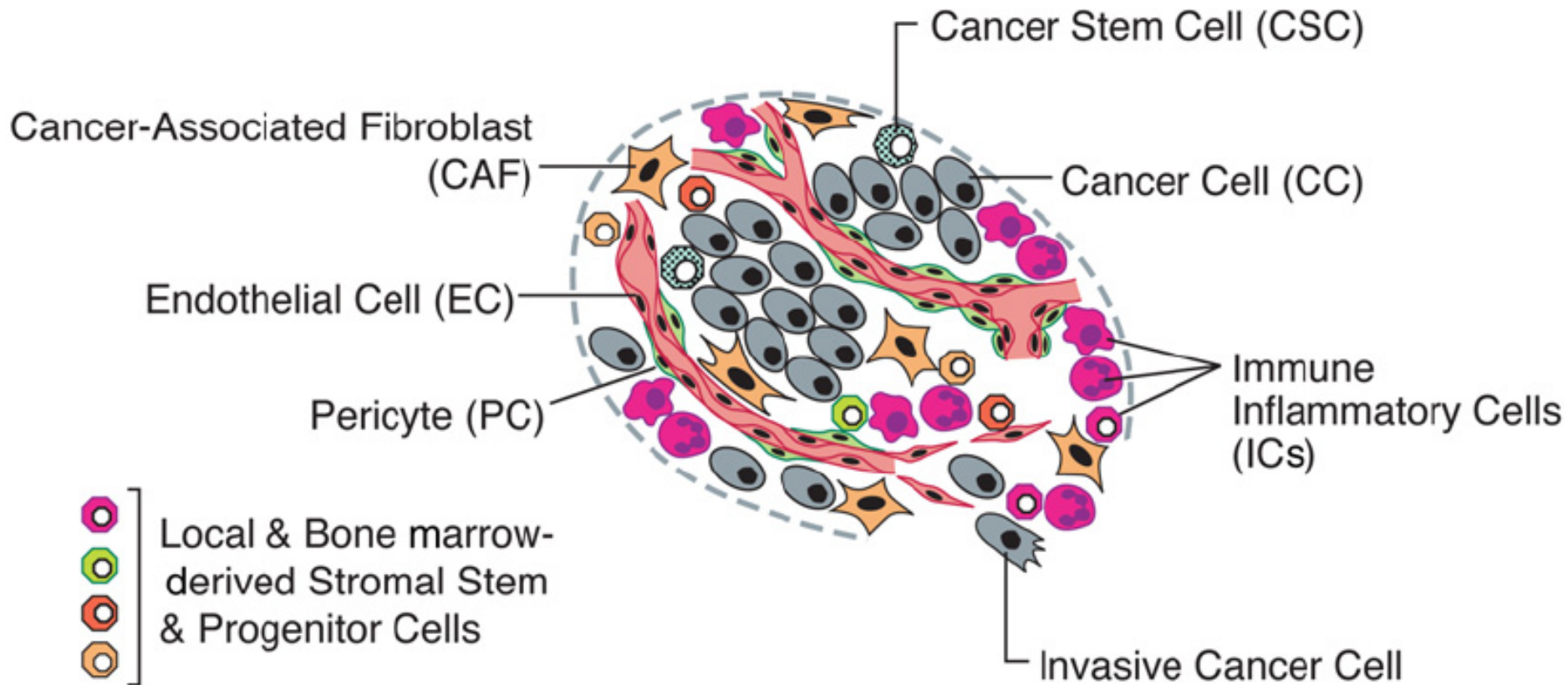


The killer (pun intended)

Cancer arises because of **mutations** in certain genes that control cell survival and cell division. Moreover, these mutations occur at a sufficiently high rate, leading to **tumor heterogeneity** and **resistance to treatment**.

Thus cancer is not one disease even in a single patient and it is also a moving target.

Ray of Hope: The Tumor Ecosystem



Outline

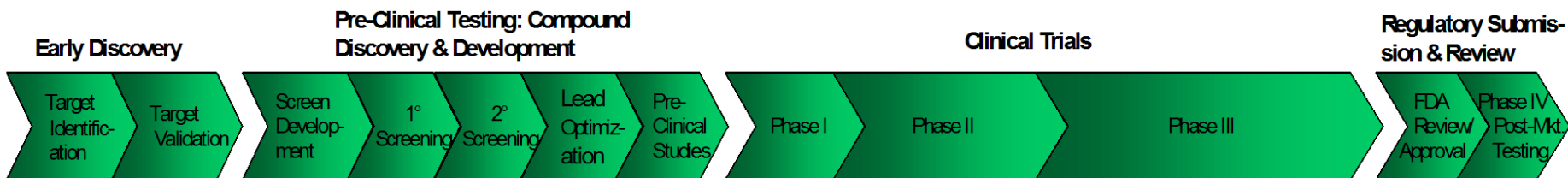
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How therapies reach patients?

- Scientifically promising ideas in the laboratory are developed by pharma/biotech (if the market is large enough, if there is IP, etc) and trials are conducted --- drug development process --- and if phase III data validates drug/device, it becomes standard of care i.e. part of mainstream medicine

DRUG DEVELOPMENT



University

Industry

Highly variable time (2-10 years) and cost (millions)

Avg. Time: 5.8 years (40%)

Avg. Cost: \$205M (41.0%)

7.4 years (50%)

\$160M (32.0%)

1.5 years (10%)

\$20M (4%)

Total Development Time: 12-15 years
Total Development Cost: \$300-\$600M

Note: Manufacturing, Phase IV, etc., consume \$115M, or 23% of development expenditures.

5,000-10,000 Compounds Screened

250 Compounds Enter Pre-Clinical Testing

5 Compounds Enter Clinical Testing

1 Compound Approved by the FDA

Years

0

1

2

3

4

5

6

7

8

9

10

11

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13

14

15

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Untapped opportunities

- Financial orphans (GlobalCures agenda!)
- Drugs for cancer use that could be expanded in their use
- Drugs in the clinical trials pipeline (expanded use)

GlobalCures

www.global-cures.org

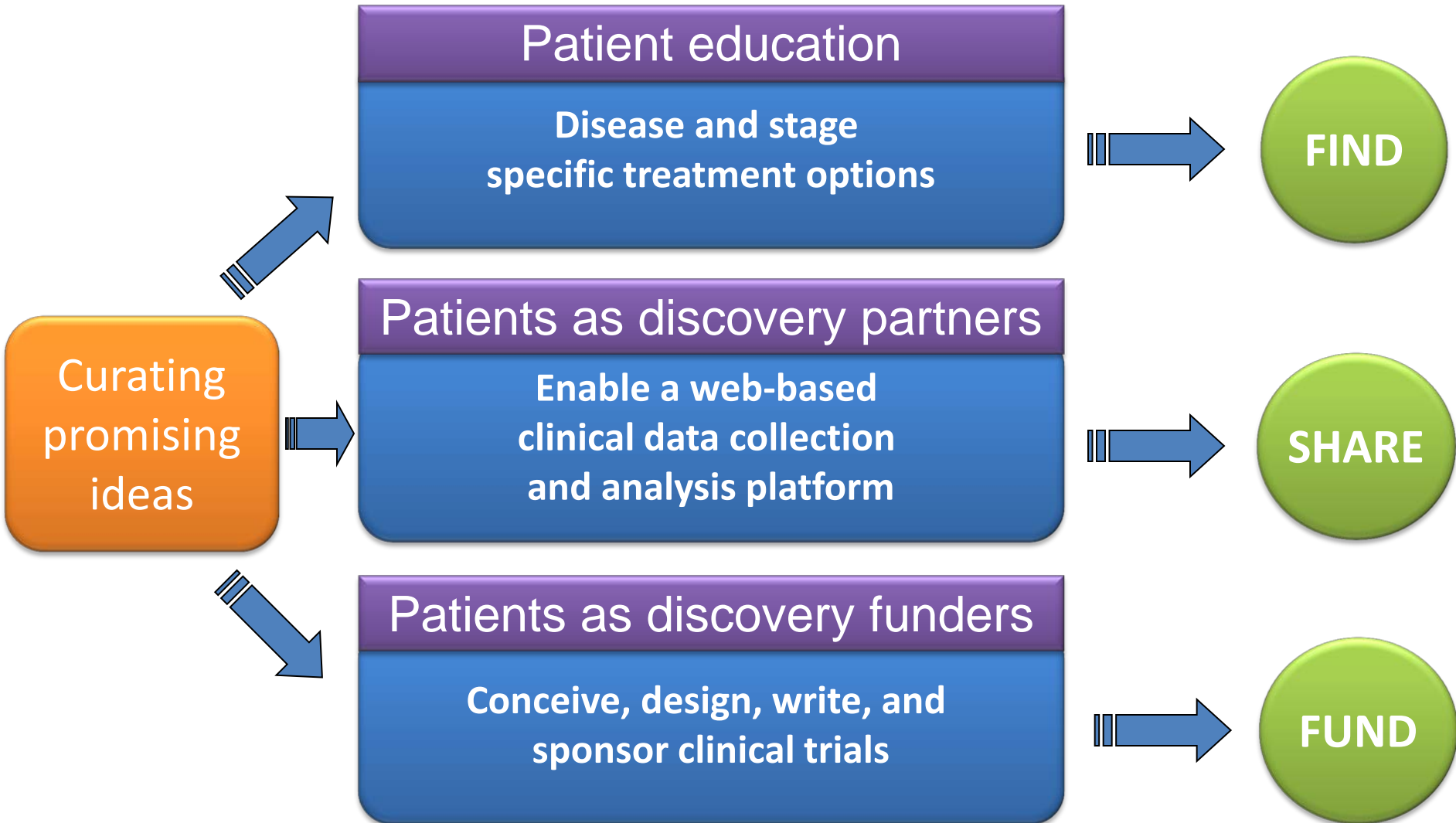
Why we exist: To **rapidly develop new treatments** for cancer and other diseases. The focus is on promising ideas which lack **financial incentive** for development. A major strategy is **drug repurposing**.

What we do: We enable patients to **find** such therapies; we ask them to **share** their experiences; and we **fund** clinical studies of promising ideas.

Patients can thereby obtain the best care possible **today** and drive the medical discoveries of **tomorrow**.

What we are: A **non-profit** organization.

Approach



Untapped opportunities

- Financial orphans (GlobalCures agenda!)
 - Drugs approved for non-cancer indications (off-label use) (drug repurposing)
 - Nutraceuticals (GRAS)
 - Other modalities (lifestyle changes, etc)

Note: interventions are immediately available, affordable, low/established toxicity (?); ideas from world at large!

- Drugs for cancer use that could be expanded in their use
- Drugs in the clinical trials pipeline (expanded use)

Operationalizing the opportunities?

- Are there circumstances in which one should consider treatments lacking high level evidence e.g. phase III data?

The LaRC vision

- LaRC as a patient service where
 - Interventions that lack a level of evidence that would place them in mainstream medicine are used. This philosophy is transparently subscribed to in a way that protects patients and caregivers.
- LaRC as an engine for discovery
 - Novel treatment modalities may emerge
 - Speed translation by bridging the gap between clinical care and the science of cancer using the world's resources

Customers: patients

- Patients who have exhausted standard of care
- Patients unwilling to accept current therapies
 - Elderly patients
 - Those who have gone previous chemo/radiation
- Patients with cancers with very poor prognosis
- Patients desiring to improve outcomes of current therapies
 - Increase cure rates for loco-regional disease
 - Increase survival for metastatic disease

Rename LaRC to Clinic of First and Last Resort!!!

Prioritizing ideas

- Promising data weighted: human phase II > phase I > case series > animal data
- Probability of producing a significant improvement in outcomes
- Mechanism of action that fits within a scientific framework for cancer therapy
- Anticipated manageable toxicity
- Biomarkers for therapy personalization
- Cost (other factors being equal)

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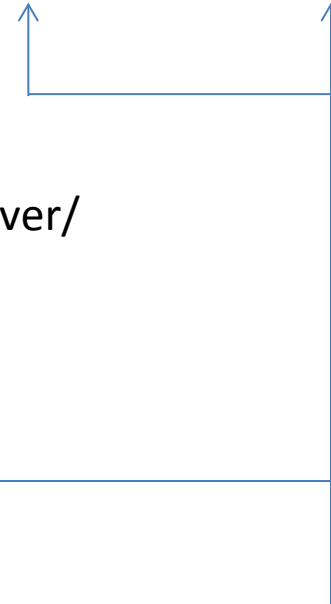
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- Creating systemic immunity with localized radiation and checkpoint inhibitors
- Targeted therapy based upon genomic profiling
- Stem cell killing drugs along with chemotherapy
- Peri-operative drugs for localized cancer to prevent recurrences

Clinical trials

Hospice



It is all about patients, one at a time!

It is all about patients, one at a time!

Dear Dr. Sukhatme & Mrs. Sukhatme

Wishing you a wonderful year ahead.

Thank you again for everything.

[redacted] continues to do well and
not a day goes by that we fail to
remember all you did for us.

1 year
of clean
scans!

Joy to the World!

Warmest wishes,

[redacted]

Dx Synovial Sarcoma
December 2014 2015

Remember...

No man is an island...everyman is a
piece of the Continent, a part of
the maine

Any mans death diminishes me

And therefore never send to know
for whom the bell tolls

It tolls for thee

Devotions upon Emergent Occasions

John Donne (1624)

Thank you!