



Stanford
MEDICINE



**SPARK: Translating Academic
Discovery to Patients' Benefit;
Lessons from our 14 Years of SPARK at
Stanford and Around the World**

Daria Mochly-Rosen

Dept of Chemical and Systems Biology

Stanford University, School of Medicine



***9th International Symposium on Higher
Order Structure of Protein Therapeutics***

April 12, 2021

- What is **SPARK**, why do it and what are its goals
- A brief guide to the entrepreneur from an ex-entrepreneur
- Why **SPARK Global** and why now

The challenge – how to translate good ideas to great solutions?

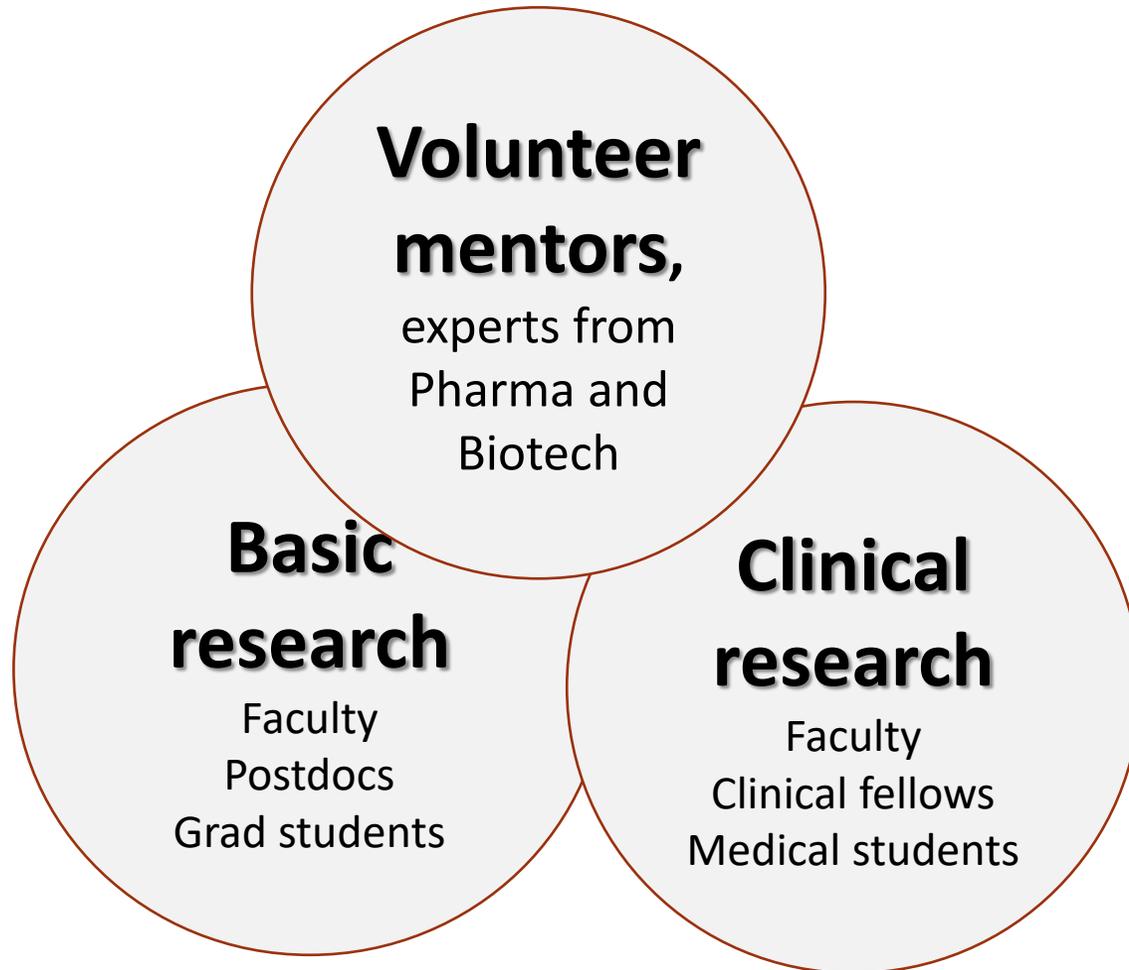
- 1. *The value gap:*** academic projects are considered premature: not robust
 - The chosen indication and/or solution are inappropriate, or not realistic
 - The findings are not reproducible
- 2. *A knowledge gap:*** Academic inventors have no knowledge in drug development
- 3. *A cultural gap:*** academic inventors do not value applied science and industry views academic as unreliable
 - Translational research is not aligned with academic reward

Our goals – overcoming the three gaps

SPARK aims to *increase* the impact of academic inventions for the benefit of patients worldwide, through:

- Increase the value by adding industry standard studies, focusing on fast solutions for patients *regardless* of economic outcome.
- Increase knowhow by a unique education and mentoring of the innovative academic scientists *within* academia;
- Increasing mutual respect between industry and academic scientists

The participants



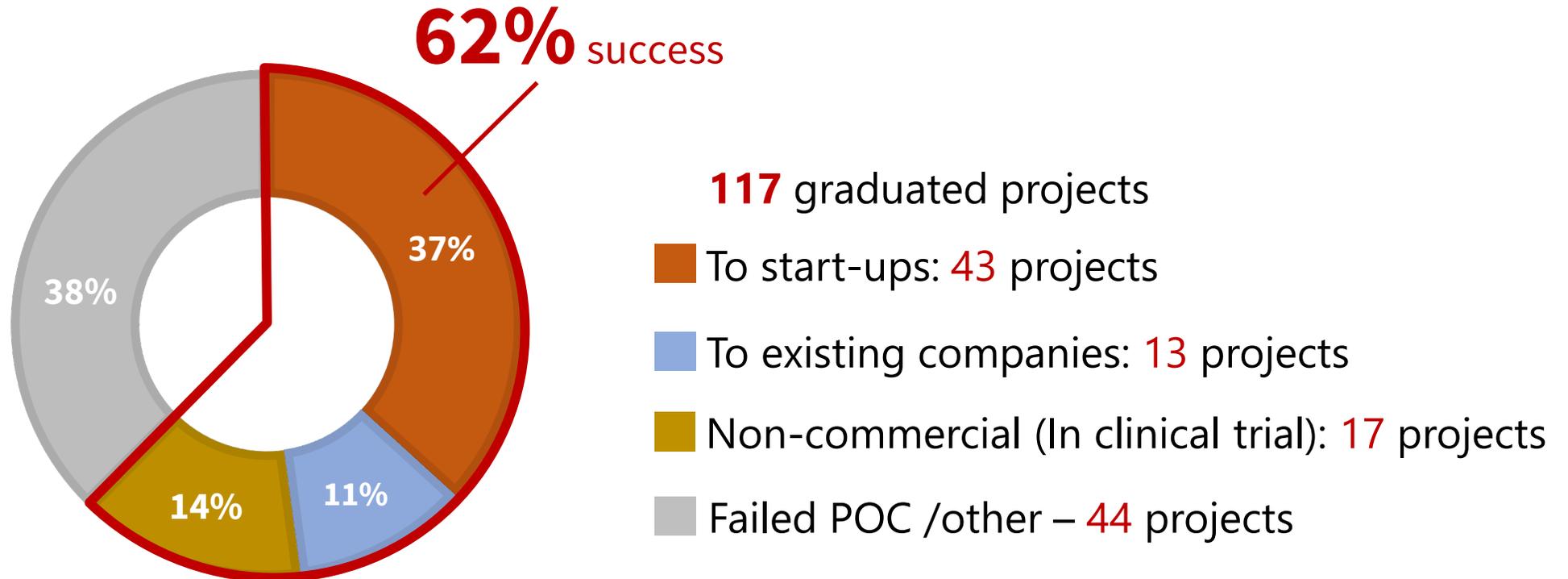
The formula to success

- Many volunteer advisors with many academicians
- In one room, ongoing
- On university campus
- No hierarchy
- Not aiming to reach a consensus
- **Learning** from **successes AND failures**

Mix scientists from industry and academia to work on solutions



SPARK works



Our Record

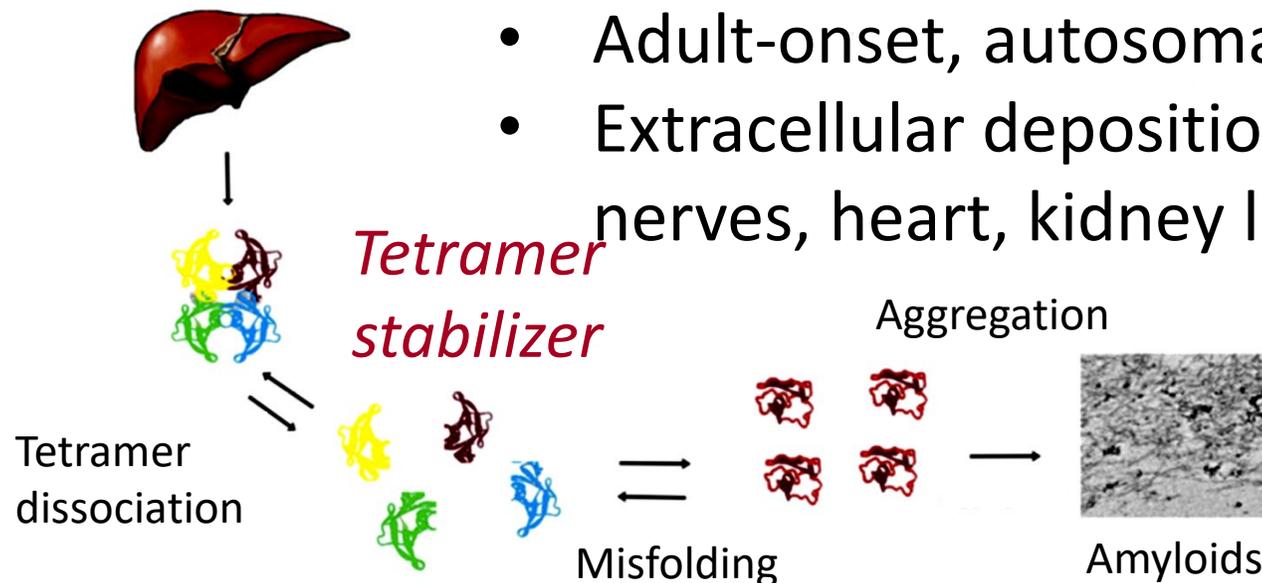
- **Return of Investment:** For every \$1 received by a SPARK project, the PI received \$8 in grant funding for Stanford.
- **Publications:** Three SPARK project-related publications per project.
- **Commercial Funding:** Start-ups based on SPARK's licensed technologies raised an average of \$16 million per project.
- **Attrition:** SPARK start-ups have less than 10% attrition rate; only 4 of the 43 start-ups folded.

Some of the startups and their pharma partners



Hereditary transthyretin amyloidosis, a case for a *Higher Order Structure of Protein Therapeutics*

- A rare genetic condition affects an estimated 50,000 people worldwide.
- >120 mutations associated with hATTR amyloidosis.
- In hATTR amyloidosis, mutations in the TTR gene causes misfolding



- Adult-onset, autosomal-dominant; variable penetrance
- Extracellular deposition of amyloid fibrils in peripheral nerves, heart, kidney life-threatening

Eidos Therapeutics soars after IPO tops targets, raises \$106M

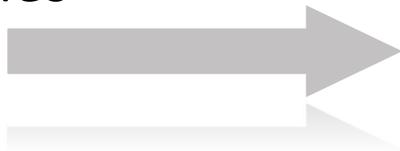


Isabella Graef, PhD

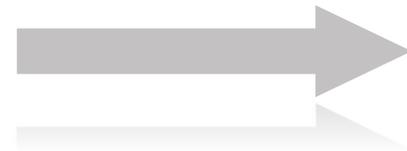
Asst. Professor of Pathology

hATTR – hereditary form of amyloidosis caused by mutation in transthyretin protein, resulting in cardiomyopathy and neuropathy

AG10 - Rationally designed small molecule to that stabilizes mutant transthyretin protein, preventing amyloid deposition in heart and nerve tissues



SPARK



Why is the attrition rate so low?

Attrition: SPARK start-ups have less than 10% attrition rate; only 4 of the 43 start-ups folded.

- Inventors are better partners with investors- educated in pharma work
- Projects selected for and mentored by MANY industry experts
- Connections with many companies, investors & future workforce

What do we teach?

- Start with the **end product** in mind
- Funding based on **milestones**
- Teach **project management** skills
- Provide **product development**-focused education
- Mentorship by **industry veterans**
- Provide **introductions** to collaborators, companies, contractors and investors
- Teach **entrepreneurship** skills



- What is **SPARK** and what are its goals
- A brief guide to the entrepreneur from an ex-entrepreneur
- Why **SPARK Global** and why **SPARK Global** now



K A I
PHARMACEUTICALS

Dallas Sept 4, 2004




SPARK
AT STANFORD

Parsabiv approved:

Parsabiv[®] - launched in the U.S. in the first quarter of 2018.

AMGEN

Approved in the US and Europe

 **Parsabiv[®]**
(etelcalcetide) Injection for intravenous use
2.5mg/0.5mL | 5mg/1mL | 10mg/2mL



KAI-4169 Licensed to Ono for Japan before company was acquired by Amgen

Approved in Japan, too

Product photograph



ONO PHARMACEUTICAL CO., LTD.
Corporate Communications
public_relations@ono.co.jp

Worldwide sales for second quarter reporting by Amgen (\$102 M)

Entrepreneurship in a nutshell:

Lesson 1:

Consult! Consult! Consult!

Entrepreneurship in a nutshell:

Lesson 1:
Consult! Consult! Consult!

Lesson 2: Dare!
Don't fear to fail –
because you will!

Lesson 3: Persevere!
Have no ego!

Lesson 4:
Diversify!

Lesson 5:
Keep basic research active

Lesson 6:
Think before giving up

Lesson 7:
Good data are not enough –
Know your market

Lesson 8: Your company is
only as good as your team!

- What is **SPARK** and what are its goals
- A brief guide to the entrepreneur from an ex-entrepreneur
- Why **SPARK Global** and why **SPARK Global** now

Why build a **SPARK** program?

- To translate the amazing science of academia to products that benefit patients – **our social responsibility**
- Because it provides important **education** to students and postdocs for job that they are likely to hold
- Because it may **trigger biotech** industry and contribute economically to the area.

How to begin

1. Internal champions
2. Program director(s) with relevant experience
3. Volunteer industry advisors (many)
4. Core facilities (HTS, proteomics, formulation, etc)
5. Funding
6. Flexibility

SPARKing in the world





Our values

Non-for-profit

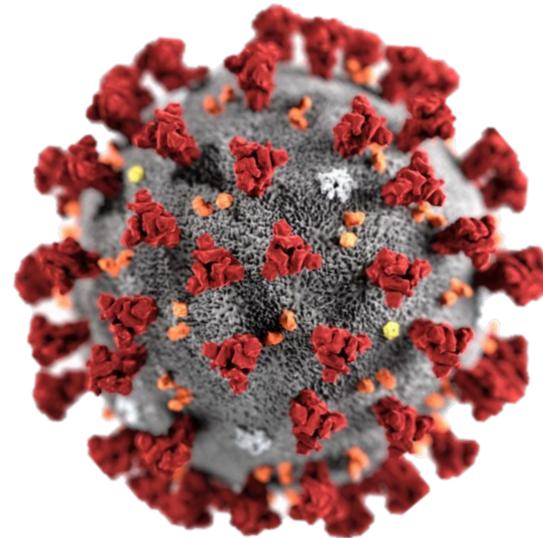
Ethical

Based on volunteering spirit

For patients and society

Why **SPARK** global?

So that together, we can better address global health threats.

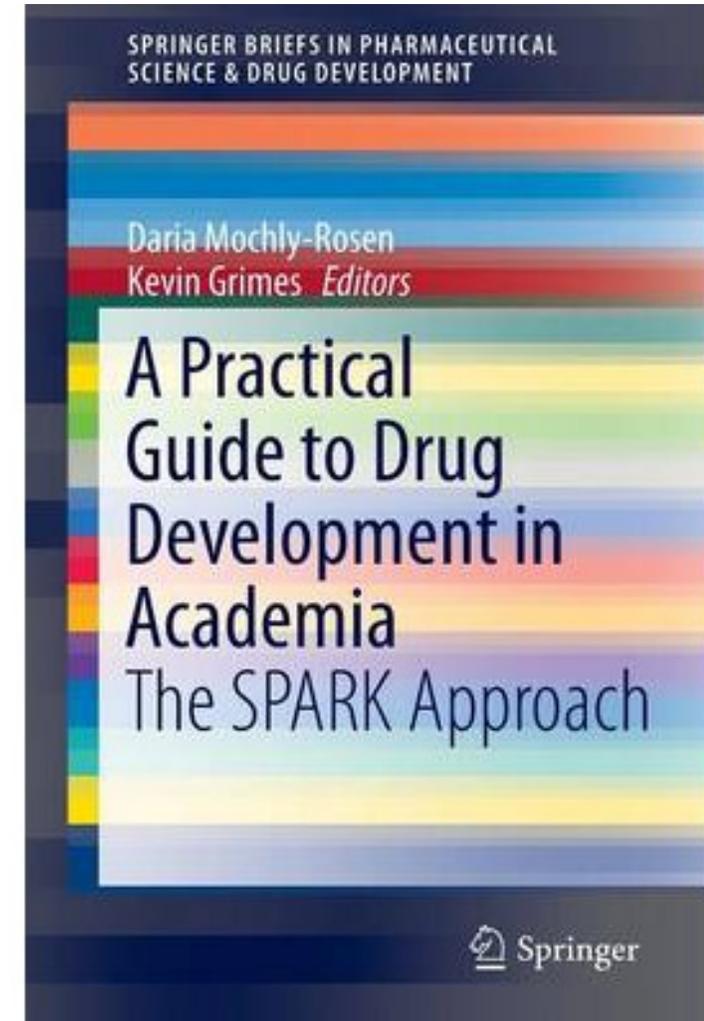


>52 projects

- What is **SPARK**, why do it and what are its goals
- A brief guide to the entrepreneur from an ex-entrepreneur
- Why **SPARK Global** and why now

SPARKing to benefit patients and society

Daria Mochly-Rosen,
mochly@stanford.edu



SPARKing to benefit patients and society

