



SBIR/STTR Proposals: Successful strategies for startups with university-generated technologies



CENTURION
TECHNOLOGY
From innovation to commercialization

Kirk J. Macolini

President

Centurion Technology

www.CenturionTechnology.com

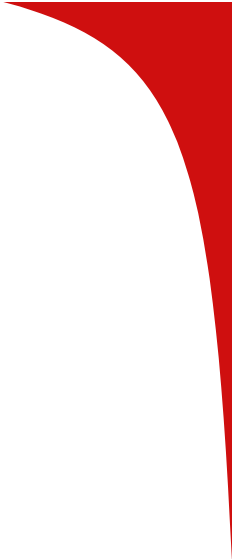
Kirk@CenturionTechnology.com

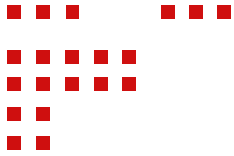
(607) 277-1570



Agenda

- Introduction
- Successful Strategies
 - Choose Wisely
 - Invest in a proposal
 - Use a good process
 - Build a strong team
 - Develop the big picture
 - Write a strong proposal
- Agency Overview
- Questions





INTRODUCTION





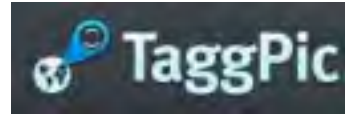
Who is this guy???? (Kirk Macolini)

- Founded Centurion Technology in 2002 to help small business compete effectively against SBIR mills
- Worked on 100s of proposals over the last decade
- In the last 4 years alone 117 successfully funded proposals (primarily SBIR/STTR – but also other mechanisms (i.e. BAA, CMDRP, etc) worth over \$40 million.
- National average: Phase I - ~12%; Phase II - ~40%
- Centurion Technology : Phase I - ~30%; Phase II - ~60%

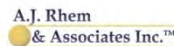
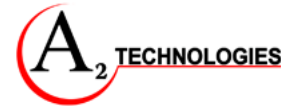




Small businesses from all sectors



MEZMERIZ inc.





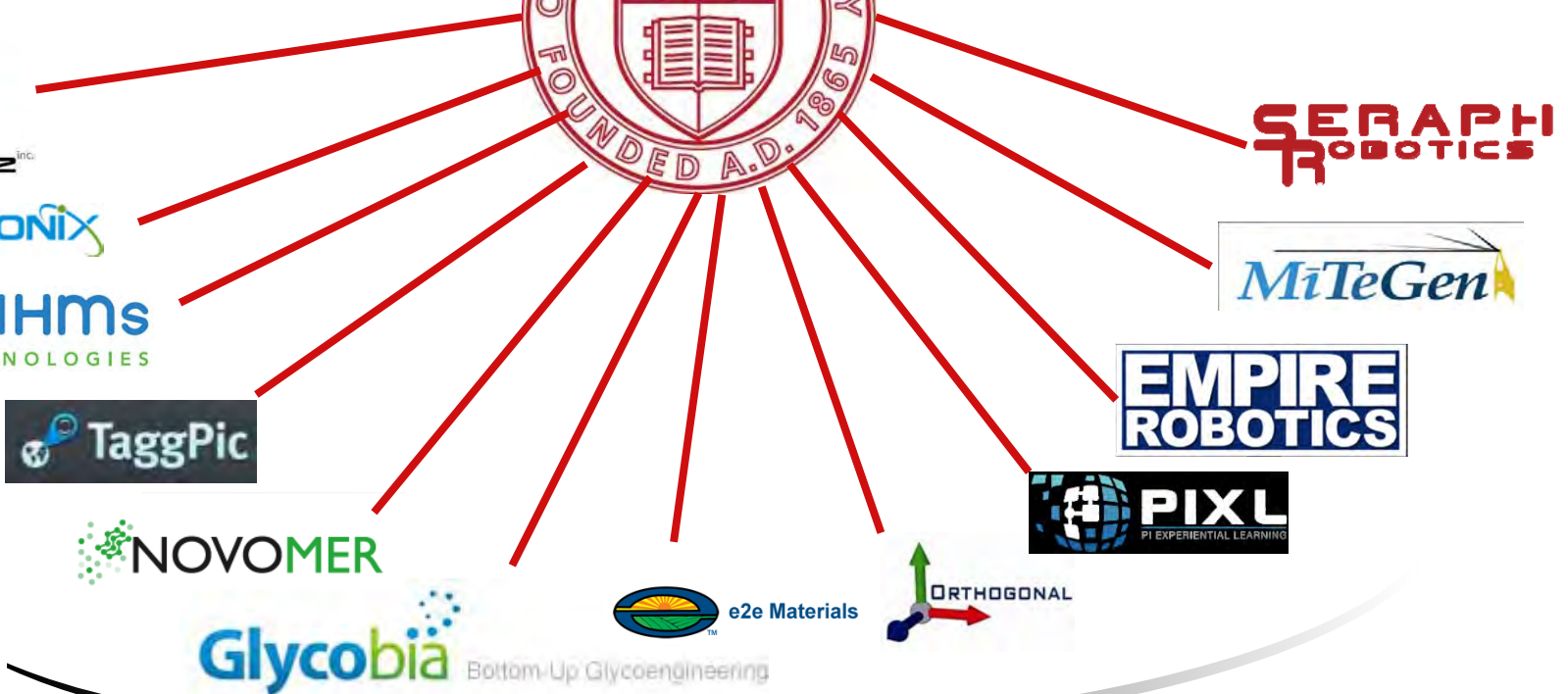
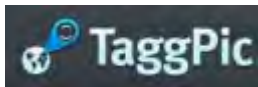
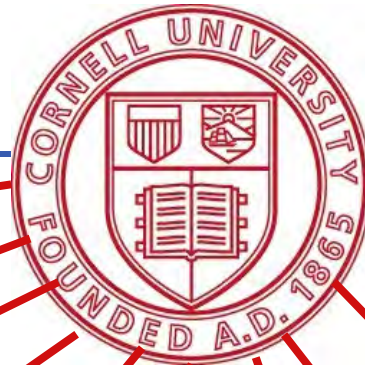
Many with University Roots



UC San Diego



UMASS
AMHERST



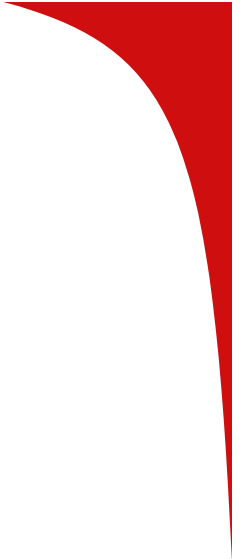


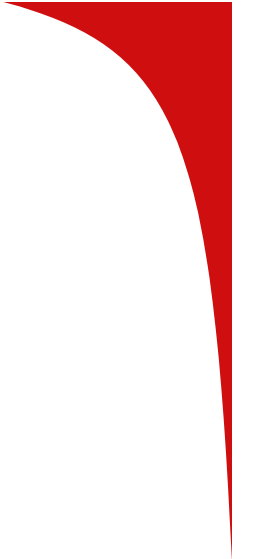
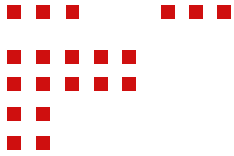
Who are you?

- 15- 30 second quick intro
- Who are you:
- What is your technical field
- Do you have special interest in any particular agency? Or other special SBIR issue?

I'll do my best to tailor the discussion on the fly!

You can ask topic RELEVANT questions as we go.





STRATEGY 1: CHOOSE WISELY





STRATEGY : Choose Wisely

- Preparing a winning SBIR/STTR proposal is a mountain of work.
- The key is to pick battles you can win
- Choosing the right topic/agency is the most overlooked (and perhaps most important) ingredient of success
- Factors in play include:
 - Technology vs. capability approach
 - Agency (and sub-agency) selection
 - Topic selection





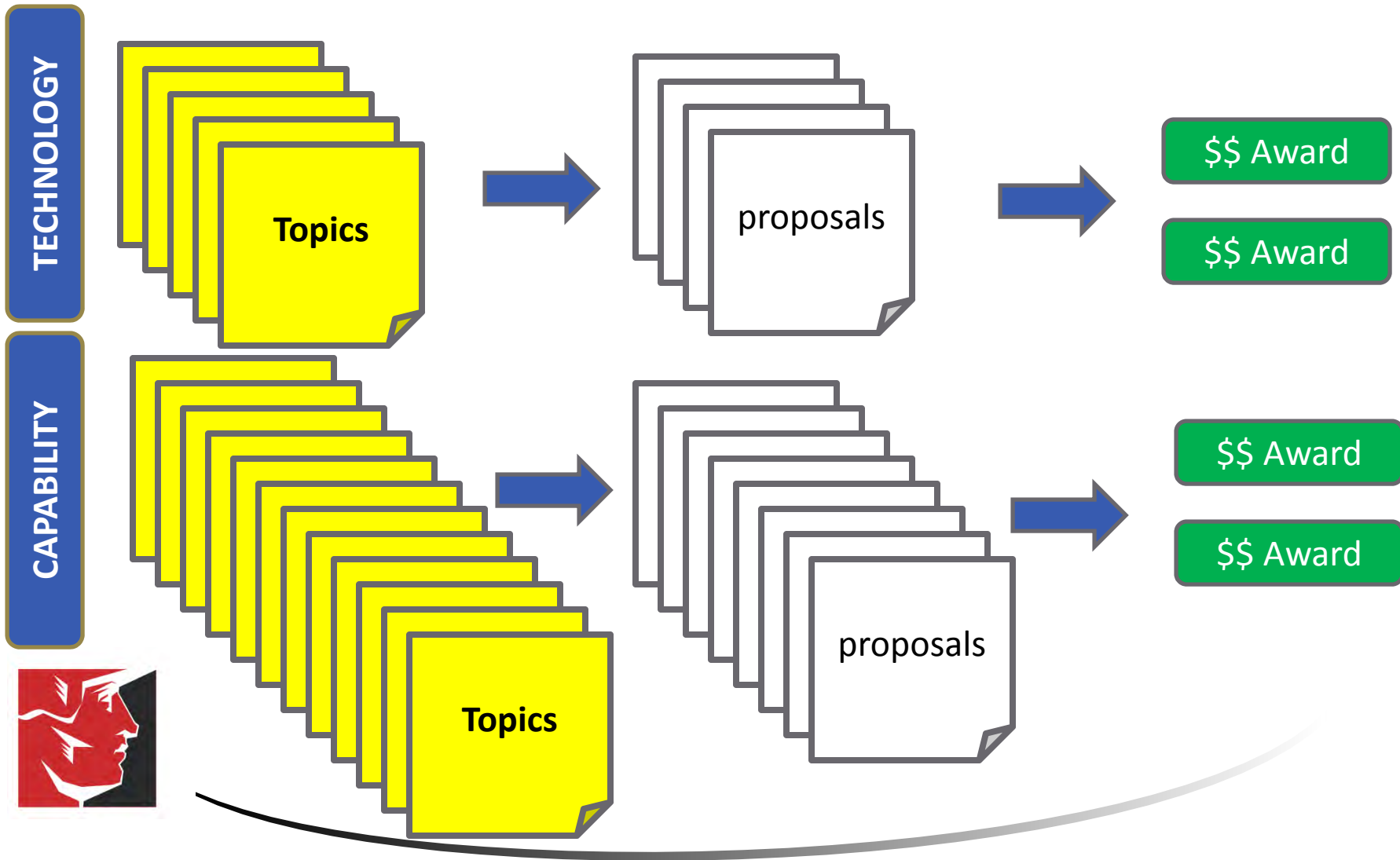
Technology vs. Capability

- Technology Companies are focused on developing specific technology (ies).....regardless of whether or not they win an SBIR
- Capability companies have smart people who can solve problems...and use this capability to opportunistically compete for awards
- The result is a tradeoff between success rates and opportunities



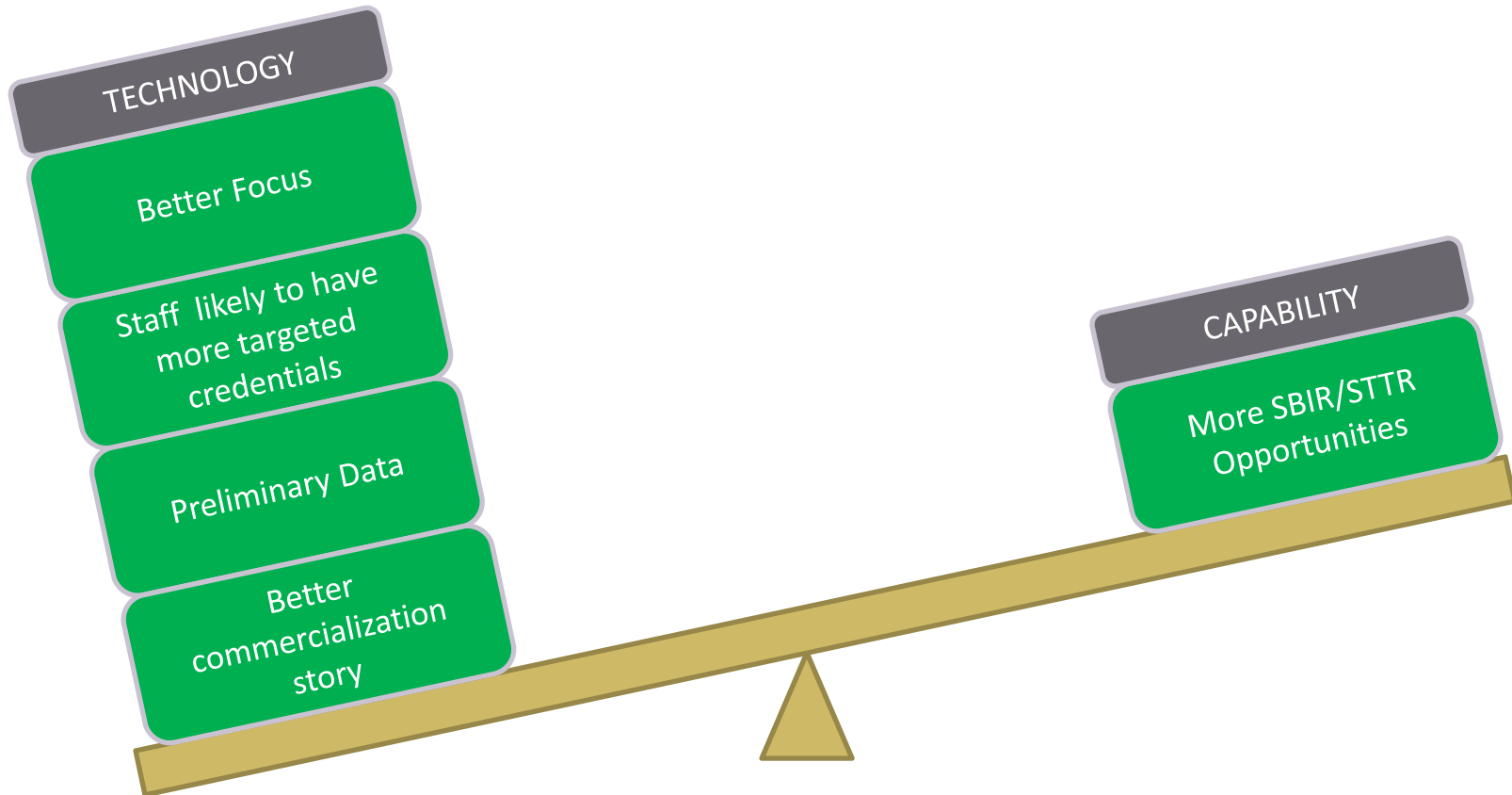


Technology vs. Capability Approach





Head-to-Head (technology vs. capability)



“Concentrate your energies, your thoughts and your capital.... The wise man puts all his eggs in one basket and watches the basket.” Andrew Carnegie



Agency Guidance



\$19.3 M



\$13.4 M



\$12.6 M



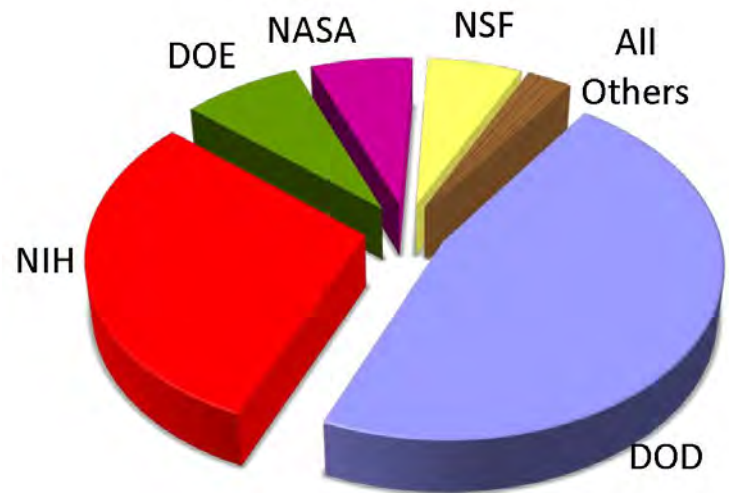
\$8.6 M



\$4.8 M



\$4.7 M





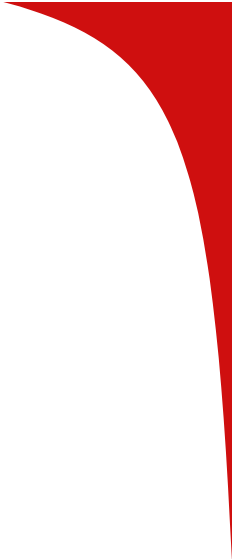
Narrow vs. Open Topics

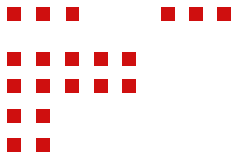




Agency selection

- Seems obvious – but it's not
- Lot's of overlap in projects funded by various agencies
- Each agency takes a different perspective
 - EX: DoD, NASA are trying to solve problems
 - EX: NIH, DoE are trying to promote research in general
 - EX: NSF is trying to promote research AND stimulate successful commercialization
- This leads to varying levels of acceptance by different agency
- Where to apply can be extra challenging when considering multiple granting agencies

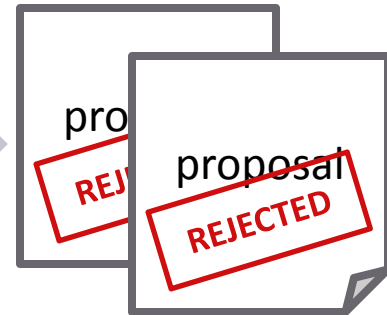




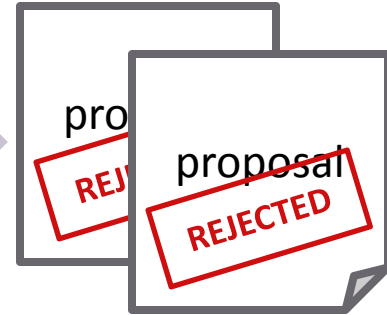
CASE STUDIES: NIH vs. NSF



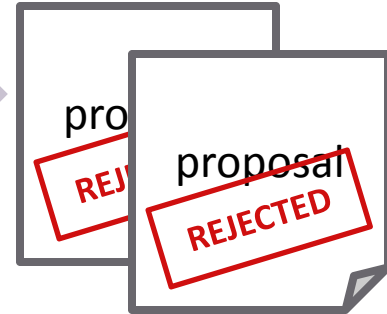
Catheter Ablation device
for atrial fibrillation

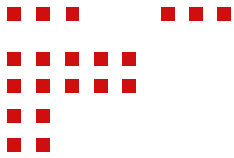


Anti-microbial polymer for
Catheters



Reporter molecule for DNA screening

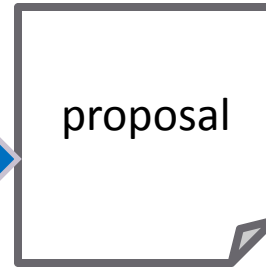
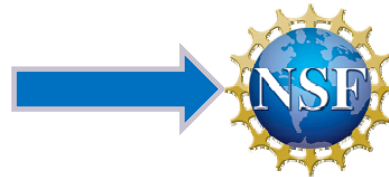




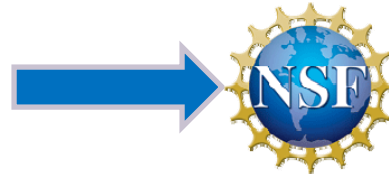
CASE STUDIES: NIH vs. NSF



Catheter Ablation device
for atrial fibrillation



Anti-microbial polymer for
Catheters



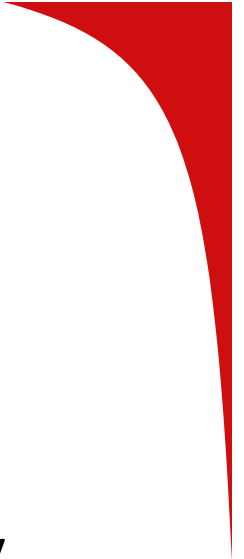
Reporter molecule for DNA screening





CASE STUDIES: NIH vs. NSF

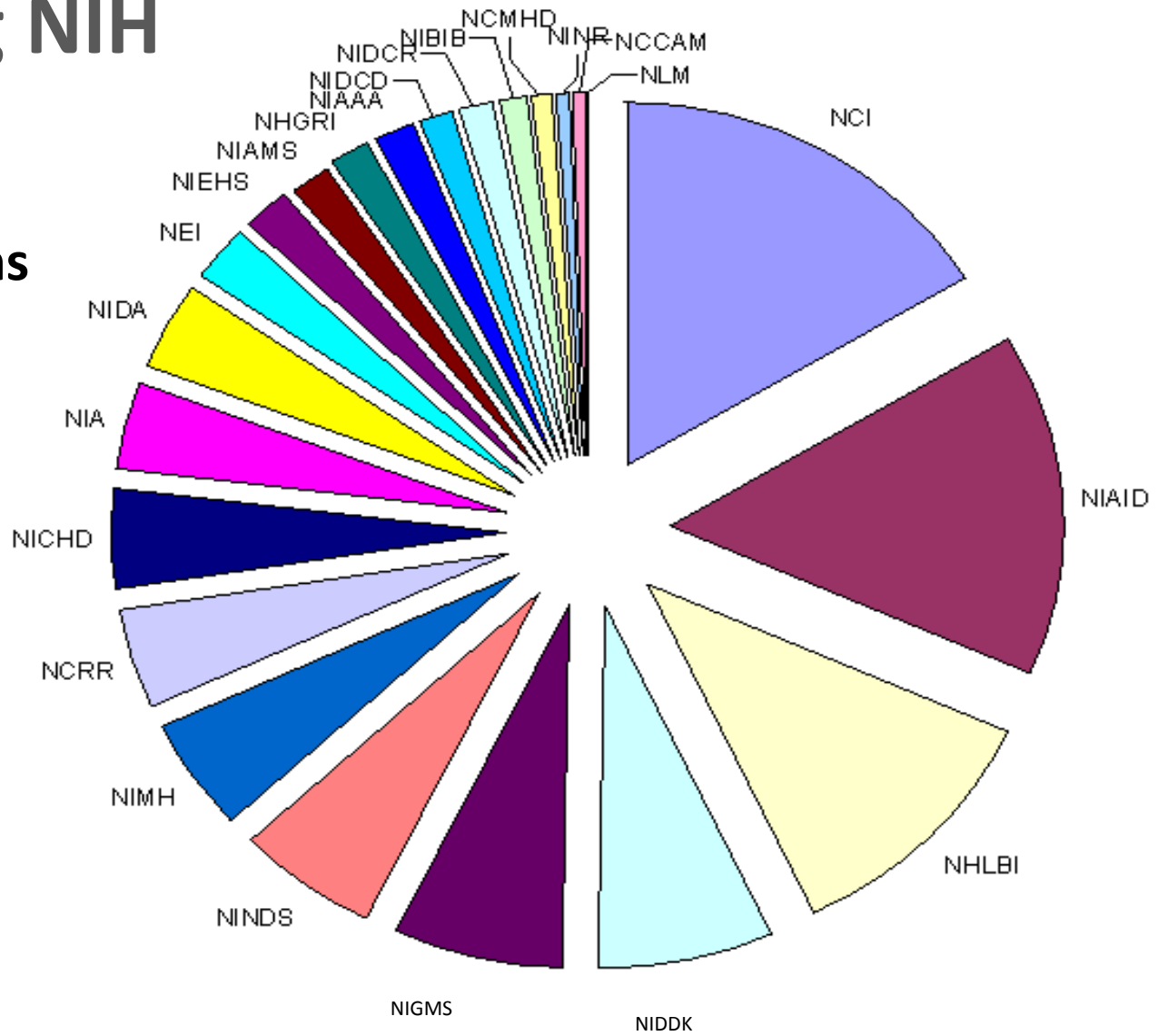
- On the surface all proposals were ideal for NIH
- NIH has a far larger budget compared to NSF
- So why were proposals soundly rejected by NIH funded by NSF
 - Projects were all development projects (NIH tends to be more clinical/evaluation focused, NSF tends to be more engineering focused)
 - Strong commercial stories are important at NSF, NIH barely cares
- Take away message – **do your homework!**
 - Talk to program managers
 - Study previous awards abstracts to see what the agency funds
 - Look at websites of previous winners





Navigating NIH

SBIR/STTR Budget Allocations

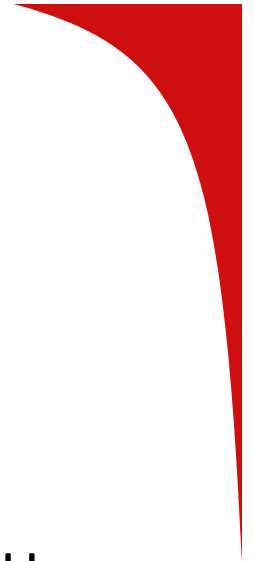




Navigating NIH

- Each subagency has own funding policy
- Some publish paylines (10-90, 10 is best score)
- You can request assignment to a subagency (otherwise NIH will choose)
- Choosing the right sub agency can be the difference between success and failure

Agency	SBIR	STTR
NIAID	26	22
NHLBI	29	24
NIAMS	26	26





Case Study: Navigating NIH

silverchair
enrich innovate grow

- Developing an intervention targeted at reducing smoking rates
- National Cancer Institute has largest budget within NIH
- National Cancer Institute runs most smoking cessation research
- **An obvious choice, but.....**





Case Study: Navigating NIH



- The **WRONG** choice
- Proposal was targeted at National Institute on Drug Abuse (NIDA), and was funded...based on a score that would not have been funded at NCI
- What??? NIDA has 11th largest budget, ~1/5 of NCIs
- Need to do homework on NIH agencies
 - Understand overlap between agencies
 - Look at success rates (data available on NIH SBIR homepage)
 - Look at competitiveness of funded projects
 - Look at funding commitments





NIH Phase I SBIRs 2012

Totals	4,234	665	15.71%	\$153,942,015
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NIDCR	57	8	14.0%	\$1,473,113
NIMH	89	12	13.5%	\$3,148,540
NINDS	245	33	13.5%	\$8,890,048
NIDDK	310	31	10.0%	\$8,386,184
NCI	786	76	9.7%	\$17,626,830
NINR	52	5	9.6%	\$841,169
NCCAM	34	3	8.8%	\$632,748
NIAMS	185	16	8.6%	\$4,302,808
NIBIB	247	17	6.9%	\$2,866,619

Below Average

NCATS	48	32	66.7%	\$6,816,586
NIDA	59	22	37.3%	\$4,135,378
†OD ORIP- SEPA	32	11	34.4%	\$1,881,997
NIAAA	28	9	32.1%	\$1,970,936
NHGRI	41	12	29.3%	\$2,932,385
NIDCD	43	12	27.9%	\$2,256,406
NICHD	183	38	20.8%	\$8,229,767
NIGMS	355	71	20.0%	\$15,220,019
NIMHD	30	6	20.0%	\$1,095,770
NEI	103	20	19.4%	\$4,716,196
NIEHS	88	16	18.2%	\$3,620,890
NHLBI	407	73	17.9%	\$18,596,792
NIAID	550	98	17.8%	\$26,263,210
NLM	29	5	17.2%	\$675,404
NIA	233	39	16.7%	\$7,362,220

Above Average





NIH Phase II SBIRs 2012

Totals	901	277	30.74%	\$ 165,981,802.00
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NIDDK	70	21	30.0%	\$13,396,055
NCCAM	7	2	28.6%	\$1,114,027
NINR	4	1	25.0%	\$159,649
NINDS	41	10	24.4%	\$6,216,652
NIMHD	17	4	23.5%	\$1,518,570
NCI	145	27	18.6%	\$15,993,999
NIAMS	28	5	17.9%	\$2,220,089
†OD				
ORIP-SEPA	7	1	14.3%	\$1,031,463
NIBIB	34	2	5.9%	\$146,305

Below Average

NCATS	15	9	60.0%	\$6,066,803
NIDA	17	10	58.8%	\$5,833,735
NIMH	37	17	45.9%	\$8,550,754
NEI	30	13	43.3%	\$7,232,500
NIAAA	15	6	40.0%	\$3,485,755
NIGMS	81	32	39.5%	\$17,475,290
NICHD	35	13	37.1%	\$6,684,036
NIDCD	11	4	36.4%	\$2,588,590
NIEHS	17	6	35.3%	\$2,228,182
NIAID	93	32	34.4%	\$27,088,299
NHGRI	15	5	33.3%	\$2,851,095
NIA	57	19	33.3%	\$8,361,442
NIDCR	22	7	31.8%	\$4,111,105
NHLBI	98	31	31.6%	\$21,627,407

Above Average





Topic selection is important

- **Just because you have a good hammer doesn't mean everything is a nail.** Technology Companies tend to try squeeze their technology into inappropriate topics. **End result is proposals with virtually no chance of winning.**
- **It's not enough to be able to solve a problem, you have be able to solve it better then (nearly) everyone else.** Capability companies try to solve every problem, not just the ones they can do very well. **End result is proposals with virtually no chance of winning.**

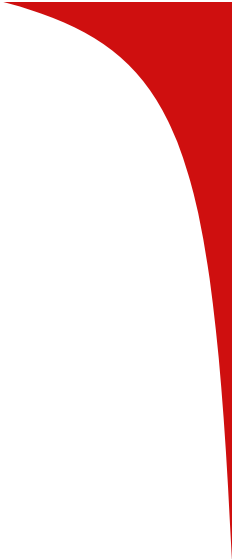
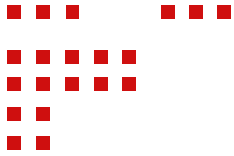




Choosing a Topic

- Call topic author (if appropriate) learn everything you can
- Ask yourself some hard questions
- Does it match the topic?
- Is your solution strong?
- Is it innovative? (innovation vs. evolution)
- **Are you prepared to invest in this opportunity????**





STRATEGY 2: INVEST IN A PROPOSAL





STRATEGY: Invest in a Proposal

- Winners view proposals as an investment not a binary event
- Less Proposals for More Awards (This is a quality game not a quantity game)
- Put your best effort in (or somebody else will)
- A proposal is a product you have invested in – the key is to capitalize on that investment
- A rejected proposal may be
 - Submitted to another agency
 - Resubmitted to the same agency





Capitalizing on the Investment



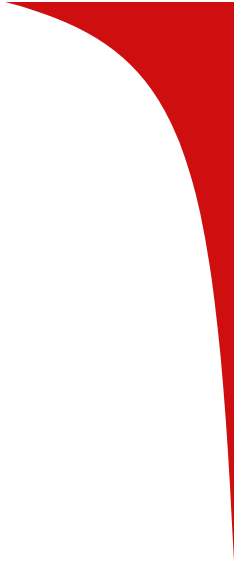
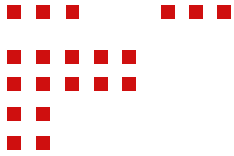
"I always tried to turn every disaster into an opportunity." John D. Rockefeller



Resubmitting a Proposal

- **NIH and NSF allow you to resubmit a proposal 1 time**
- **NIH expects special introduction**
- **Other agencies you need to find a new relevant topic**
- **Learn from previous reviews**
- **If your changing agencies makes sure your tailoring to that agency**





STRATEGY 3: USE A GOOD PROCESS





STRATEGY: Use a good process

- Start early!!! Last minute proposals are losers
- Don't drink your own Kool Aid
- Don't write a proposal, engineer a proposal
- Use untainted people to red team your proposal
- Leave enough time for partners to provide input.
 - Most Universities need 10 business days to provide administrative info



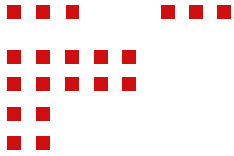
"Before everything else, getting ready is the secret of success." Henry Ford



Typical Proposal Process

Weeks Out	tasks
6-8	Choose topic, contact topic author, assess strengths weaknesses, and mitigate weaknesses
5	Outline – check if it still is viable
4	Draft Proposal
3	Iterate based on feedback from key partners
2	Iterate based on red teaming proposal
1	Finalize proposal
0	Submit early





STRATEGY 4: BUILD A STRONG TEAM





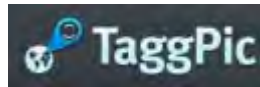
STRATEGY: Who is the Competition???

- Remember: a small business is 500 employees
 - Are a 5 person company and a 500 person company really in the same league?
- Many seasoned SBIR firms:
 - Physical Optics Corporation [330 Phase II awards, **\$285M**]
 - Physical Sciences [297 Phase II awards, **\$255M**]
 - Create [271 Phase II awards, **\$213M**]
 - Intelligent Automation [230 Phase II awards, **\$170M**]
 - Radiation Monitoring Devices [223 Phase II awards, **\$200M**]
- Previous SBIR/STTR awards place a firm at an advantage
 - Preliminary data, familiarity with program manager

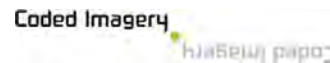
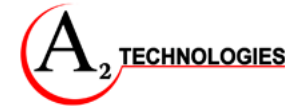




David can beat Goliath



MEZMERIZ inc.





Partner, Partner, Partner!

- Improve the caliber of personnel with consultants
 - Universities are great sources of talent
- Improve capabilities with subawards
 - Large and Small businesses, Universities





Partner with the Primes for DoD and NASA

Lockheed Martin Corp.	\$14,983,515,367
Boeing Co.	\$10,838,231,984
Northrop Grumman Corp.	\$9,947,316,207
General Dynamics Corp.	\$6,066,178,545
Raytheon Co.	\$5,942,575,316
KBR Inc.	\$5,467,721,429
Science Applications International Corp.	\$4,811,194,880
L-3 Communications Inc.	\$4,236,653,555
Computer Sciences Corp.	\$3,435,767,906
Booz Allen Hamilton Inc.	\$2,779,421,015
ITT Corp.	\$2,582,618,798
Hewlett-Packard Co./EDS	\$2,570,144,924
Harris Corp.	\$2,206,815,088
BAE Systems	\$1,952,973,818
United Technologies Corp.	\$1,631,704,120



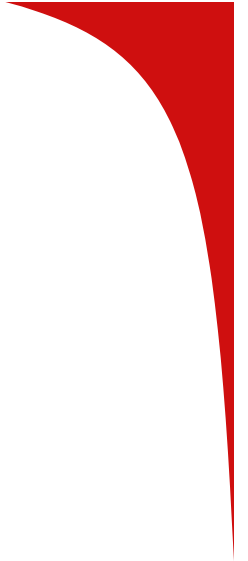
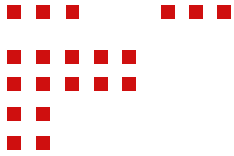


STTR as a way of strengthening team



- Seeking SBIR funding for preclinical studies on a new therapeutic for capillary leak and edema.
- As a new start-up, they had limited facilities so the animal experiments would need to be outsourced, but only 33% could be outsourced in Phase I
- STTR grant allowed them to allocate 60% of the award for the animal experiments
- Partnership with a researcher at the Medical College of Wisconsin led to 2 successful STTR projects





STRATEGY 5: DEVELOP THE BIG PICTURE





Develop a big picture story as an outline

- What is the problem?
- What is the solution?
- Why is this better than competing solutions
- Think in term of proving a hypothesis (especially in Phase I)
- Why is the team appropriate
- What is the plan for commercialization/transition

Does the big picture pass muster

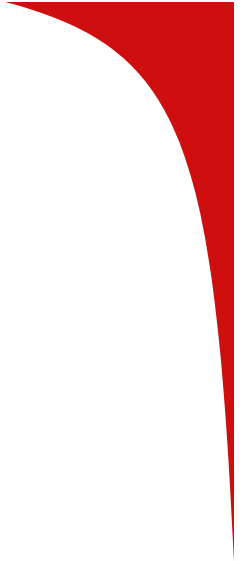
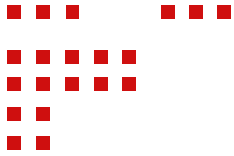




You're an engineer...be an engineer

- Identifying problems early in the proposal development proposal is critical
- **KILL – fatally flawed proposal concepts**
- **Repair – flaws before spending time writing**





STRATEGY 6: WRITE A STRONG PROPOSAL





Pass the skim test

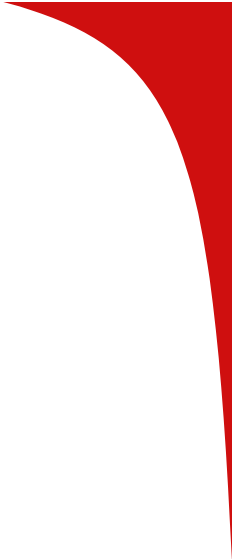
- Reviewers may have 30+ proposals each 25+ pages
 - Do you really think they read all of them cover to cover?
- You need to get a full read by
 - Having a compelling first page
 - Provide compelling imagery to pass the skim test
- Make your key concepts visual
- Don't actively fail the skim test
- Make your document look like a professional document





Convey the Big Ideas

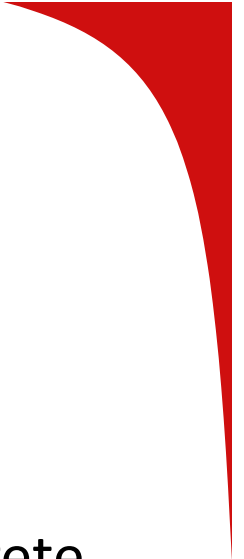
- What is the technology
- What is the “innovative nugget” – think innovation not evolution
- Understand the need
- Understand the agency
- Consider the competition
- Sell the team and facilities
- Present a reasonable commercialization plan





How should I Write a Proposal

- Proposal is written in a similar style as a peer-reviewed journal article...
- ...BUT is NOT and Academic exploration – it needs concrete goals, objectives, and measures of success
- Write concisely
- Use visuals to convey big ideas
 - Mock-up interfaces to software
- Cite your peers (especially if they might be reviewers), show you understand the field
- Avoid sloppy mistakes





Think like a reviewer

- **Understand who the Agency uses for reviewers**
- **Don't leave questions unanswered**
- Explain how the research establishes proof of concept, with hard goals
- Explain why you didn't take a different approach
- Provide alternative approaches for tasks that create dependencies
- Define measures of success – be quantitative
- **Reviewer perceptions are constantly evolving**



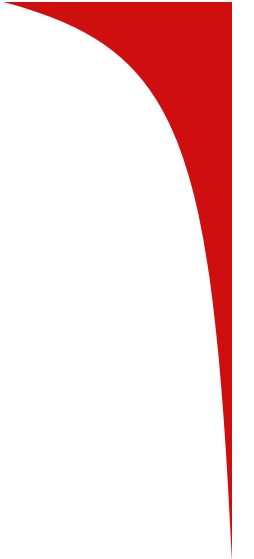
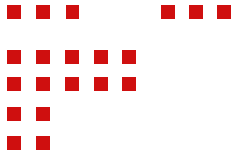
“ It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change.” Charles Darwin



Avoid common pitfalls

- Fail to demonstrate innovation (innovative in the realm of commercial products is different from innovative research)
- Overly ambitious proposals give the impression of lack of understanding of the challenges
- Fail to convey advantages over competing approaches
- Lack of a hypothesis and/or concrete measures of success
- Lack of experimental detail (workplan should be meat of proposal)
- Fail to demonstrate significance
- Lack of understanding of agency needs



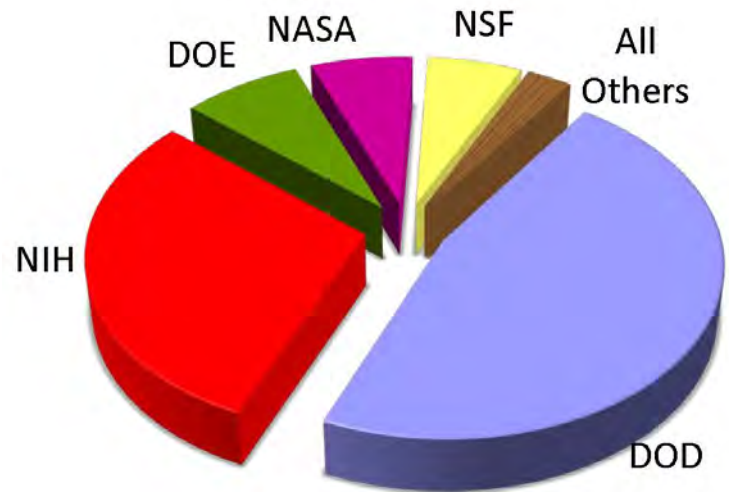


AGENCY OVERVIEW





Agency Guidance

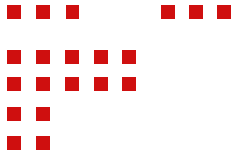




Best resources

- **SBIR Gateway** ↑
 - <http://www.zyn.com/sbir/>
- **Government's SBIR site** ↓
 - <http://www.sbir.gov/>
 - DoD
 - <http://www.dodsbir.net>
 - NIH
 - <http://grants.nih.gov/grants/funding/sbir.htm>
 - NSF
 - <http://www.nsf.gov/eng/iip/sbir/>
 - DoE
 - <http://www.er.doe.gov/sbir/>
 - NASA
 - <http://sbir.gsfc.nasa.gov/SBIR/SBIR.html>





QUESTIONS

