America's Seed Fund
(powered by the National Science Foundation)

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SBIR.STTR

Overview of the National Science Foundation

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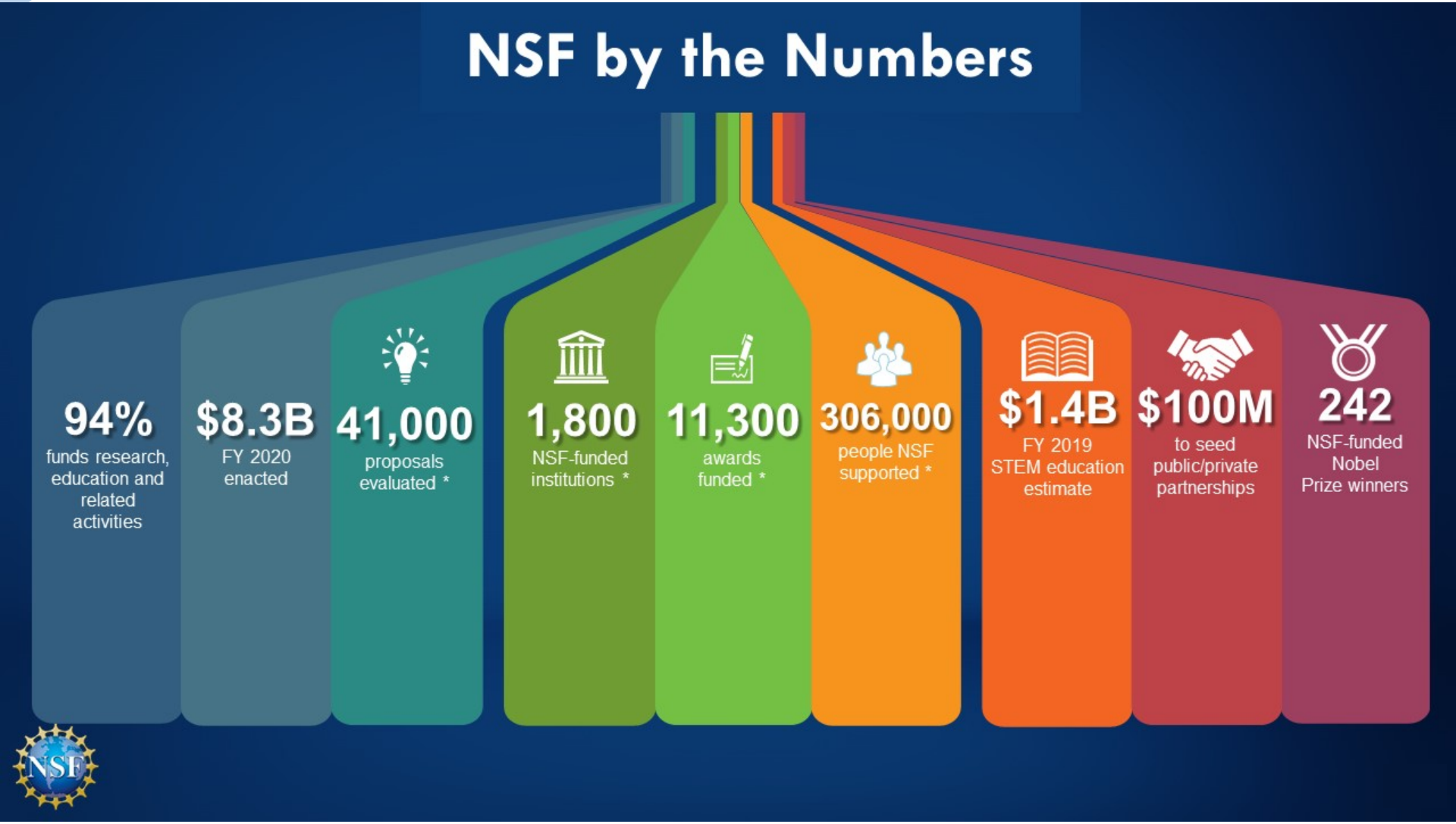
Overview of the National Science Foundation:

- Created by Congress in 1950 "*to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense...*"
- Funding agency across all fields of science and engineering
- Almost all funding is extramural
- Investigator-driven culture and process

Overview of NSF



Program basics and key features

Dedicated, centralized program structure

SBIR/STTR activities at NSF are centralized:

- All the key staff working on SBIR/STTR work on these programs (or related science/engineering innovation programs) full-time
- SBIR/STTR review process and award management led by dedicated Program Directors (PDs)
- All SBIR/STTR PDs have relevant technical expertise as well as startup/investment/tech transfer expertise
- All current SBIR/STTR PDs were hired from outside the Federal government

Investment thesis

Core funding philosophy:

- **Transformative:** Your innovation could make a difference to people worldwide or revolutionize an industry.
- **High-risk:** Your product is based on unproven technology that needs further testing (and funding for that testing).
- **Market pull:** You have evidence that your product or service could meet an important, unmet need for your customers.
- **Scale:** If you successfully bring your product or service to market, it could form the foundation for a scalable business and make a large impact in your target market.

Focus on start-ups

To maximize the impacts of our funding, we focus on start-ups:

- The impact of Phase I funding is always greatest early in the life of a given firm
- Start-ups have tended to overperform in terms of commercial outcomes as compared to even slightly older, larger firms
- The gap in the private funding ecosystem (especially for deep-tech firms) is most problematic at the pre-seed and seed stage

Peer review + startup best practices

SBIR/STTR program operations draw on best practices from multiple sources:

- Merit reviews for SBIR/STTR draw on a broad pool of technical and commercial experts
- In addition to the gold standard proposal-driven scientific merit review process, we include practices drawn from the start-up community including
  - Direct PD Q&A with all potential Phase I and Phase II awardees following peer review
  - PDs engage with awardees to monitor project progress and commercial developments throughout the life of Phase I and Phase II awards
  - Phase IIB review process involves a detailed investment-style pitch by company CEO and PI

Flexible awards

NSF SBIR/STTR issues grants*

- Given for the benefit of the community (not the agency)
- Flexible instrument intended to align with the commercial vision of the awardee
- Can be significantly rewritten or altered based on company pivots

SBIR/STTR equivalency

At NSF, the only differences between the SBIR and STTR programs are those required by policy:

- STTR requires a partner research institution (with SBIR this is optional)
- STTR and SBIR have different budget rules
- Outside of this: identical topics, application process, timelines, criteria, funding levels, review process, and programming

Broad (almost infinite) topics

Because NSF has no topical focus:

- Topics have been deemphasized
- Topics have been developed to maximize the number of great deep-technology companies that can compete
- No technology area is not considered, except for drug development (NIH has more resources and larger awards that better serve this community)

User-friendliness for new customers

In order to get the best first-time applicants to participate, we've made a number of changes:

- Removal of administrative landmines (2014-2018) – stop rejecting proposals for most simple omissions, administrative failings, etc.
- Introduction of the Project Pitch (2019) – allows for applicants to get an evaluation of appropriateness and feedback from the PD based on 1000-1500 words (and within three weeks)
- De-emphasize grantsmanship in the review process

Focus on new dealflow

In order to get the best first-time applicants to participate, we've made outreach a major priority:

- PDs attend 100+ events per year (recent major events include CES, SXSW, ACA, Techstars, SynBioBeta)
- Hired first full-time divisional communications lead in 2016
- Created on-demand videos focused on key aspects of the program
- Host dozens of webinars each year
- Launched first digital marketing campaigns in 2018
- Website fully revamped at seedfund.nsf.gov in 2018

Double down on our strengths

When it comes to awardee commercialization assistance, we focus on our unique strengths:

- Award management and programming focuses heavily on two areas: understanding of NSF's strong commercial culture, and customer discovery
  - NSF's commercial culture: reinforced through 1-on-1 interaction with PDs, Phase I workshop, Dawnbreaker
  - Customer discovery: delivered through Beat-The-Odds Boot Camp and new I-Corps for SBIR pilot (2019)
- If NSF is not uniquely positioned to deliver specific content or mentorship, give the flexibility back to the entrepreneur (i.e. $10k Commercialization Assistance Program supplement, 10% Phase II fee)

Maintain incentives throughout process

We use Phase II supplements and award structure to create continued incentives for commercial progress

- Technology enhancements for commercial progress (TECP): 20% of Phase II amount
  - Internally approved by PD, very flexible
  - Based on commercial partner traction
- Phase IIB: up to $500k
  - Eligibility based on third-party investment/revenues
  - Strong commercial diligence (hour venture-style pitch by company CEO including voice-of-investor) above $250k
- Phase II interim reports on a six-month schedule, which trigger Phase II funding tranches

Program process, criteria, changes

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Criterion 1: Intellectual Merit.

- The Intellectual Merit criterion encompasses the potential to advance knowledge. The following elements should be considered in the review of Intellectual Merit:
- What is the potential for the proposed activity to advance knowledge and understanding within its own field or across different fields (Intellectual Merit)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the Principal Investigator (PI) either at the home organization or through collaborations to carry out the proposed activities?

Criterion 2: Broader Impacts.

- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.
- The following elements should be considered in the review of Broader Impacts:
- What is the potential for the proposed activity to benefit society or advance desired societal outcomes (Broader Impacts)?
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the PI either at the home organization or through collaborations to carry out the proposed activities?

Criterion 3: Commercial Potential.

The Commercial Impact criterion focuses on the potential of the activity to lead to significant outcomes in the commercial market.

- Is there a significant market opportunity that could be addressed by the proposed product, process, or service?
- Does the company possess a significant and durable competitive advantage, based on scientific or technical innovation, that would be difficult for competitors to neutralize or replicate?
- Is there a compelling potential business model?
- Does the proposing company/team have the essential elements, including expertise, structure, and experience, that would suggest the potential for strong commercial outcomes?
- Will NSF support serve as a catalyst to improve substantially the technical and commercial impact of the underlying commercial endeavor?
- **For Phase II proposals only:** As a result of Phase I, did the firm succeed in providing a solid foundation for the proposed Phase II activity.

Merit review process

NSF policy requires that all SBIR and STTR proposals receive a minimum of 3 external reviews.

- The reviewers can submit “ad hoc” reviews via email or participate as part of a review panel (either in person or via teleconference). A majority of SBIR/STTR proposals are currently reviewed via panels.
- Panels are created anew for each group of proposals and typically comprise between 3 and 20 proposals (with an average of ~12).
- External reviewers give detailed written feedback to NSF (which is sent anonymously to the PI) and assign a rating and recommendation to each proposal.
- The PD has broad authority to go against panel recommendations with proper justification. All recommendations are concurred by the IIP Division Director and then final approval is given by NSF’s Division of Grants and Agreements.

Merit review process

Phase I review process

Phase II review process

March 2019: Project Pitch introduced

- Required new first step for potential Phase I applicants
- Potential submitters submit 2-3 pages on our website (via Salesforce) focusing on company/team, market opportunity, technology/innovation, and Phase I objectives.
- NSF responds within 3 weeks with an invitation (plus feedback) or a "not invite" response (and why).
- Phase I proposals are not accepted without a Pitch invitation
- To-date (2/26/20): 5100 submitted Pitches, 3600 invited, 1100 not invited, 400 under review
- Broad customer satisfaction with the new process:
  - 85% of the respondents find the submission process easy (via the online form)
  - 75% find the feedback from the Project Pitch helpful

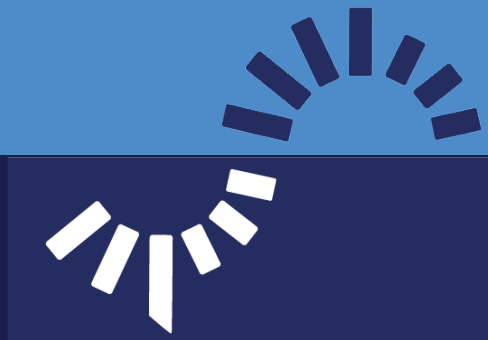
Recent changes: Other Program Changes

Early 2020: Phase I and Phase II changes

- Three-month submission windows for Phase I and Phase II
- Increased award amounts: $256k for Phase I and $1M for Phase II
- First Phase II solicitations released
- Fixed-amount cooperative agreements for Phase II awards
- Technical and business assistance (TABA) funding in Phase II
- Increased small business fee in Phase II (7 → 10 %)

Current and recent solicitations

Program	Solicitation Number	Solicitation Released	Submission windows	Max Amount	Other Changes
SBIR Phase I	NSF 20-527 NSF 19-554	December 2019	Close in early March, June, Sept., Dec. Close in June, Dec.	$256,000 $225,000	Project Pitch (March 2019)
STTR Phase I	NSF 20-528 NSF 19-555	December 2019	Close in early March, June, Sept., Dec. Close in June, Dec.	$256,000 $225,000	Project Pitch (March 2019)
SBIR Phase II	NSF 20-545 N/A	February 2020	Close in early March, June, Sept., Dec. Close in late Feb., Aug.	$1,000,000 $750,000	$50k TABA funding, fee → 10%, CA
STTR Phase II	NSF 20-546 N/A	February 2020	Close in early March, June, Sept., Dec. Close in late Feb., Aug.	$1,000,000 $750,000	$50k TABA funding, fee → 10%, CA



Data and success stories

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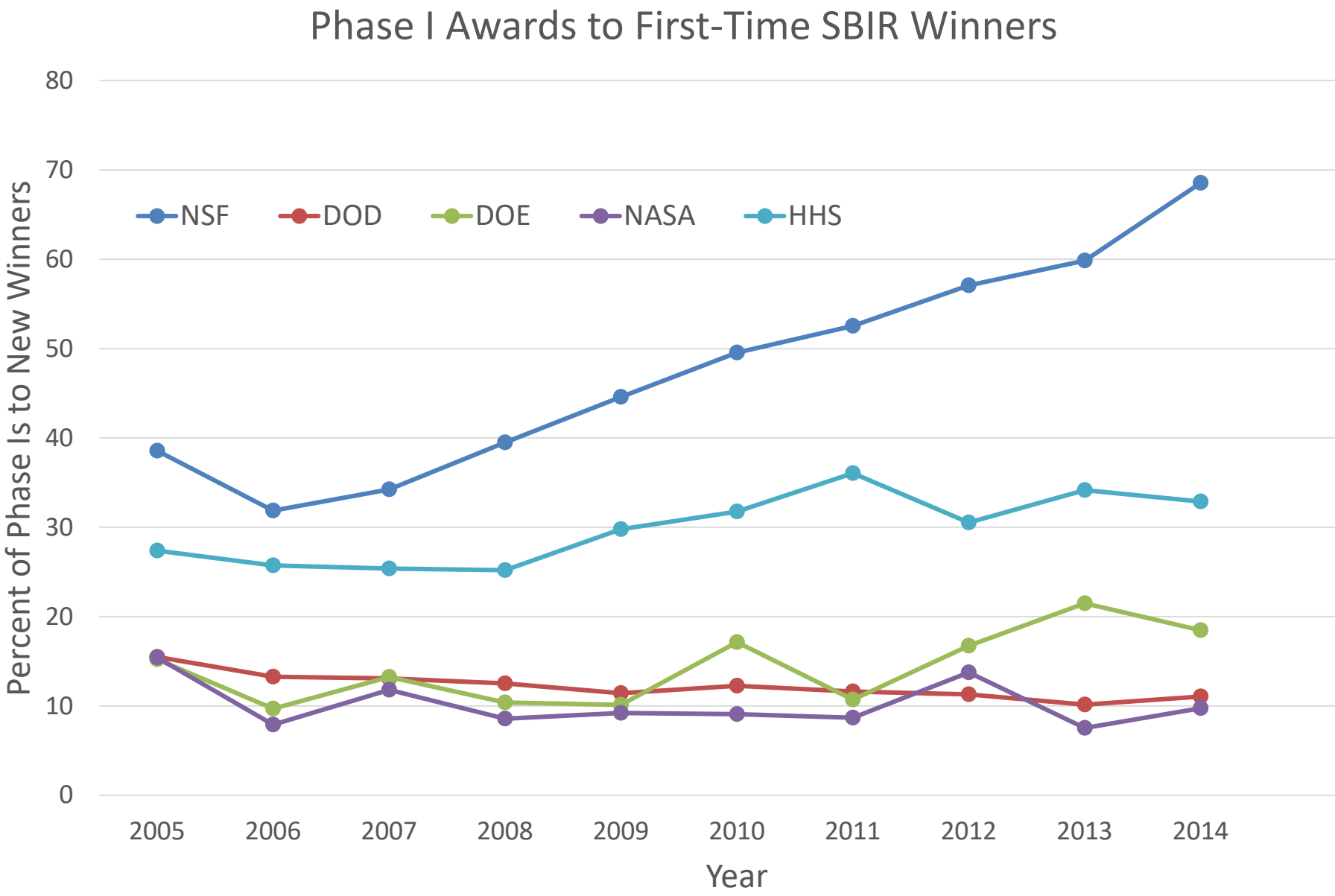
Portfolio demographics

Data from fall 2019 cohort of Phase I awards:

- 91% - firm has never had an SBIR/STTR Phase II award (from any agency)
- 85% - five or fewer employees
- 72% - founded in past three years
- >75% - first-time SBIR/STTR winners

Portfolio demographics



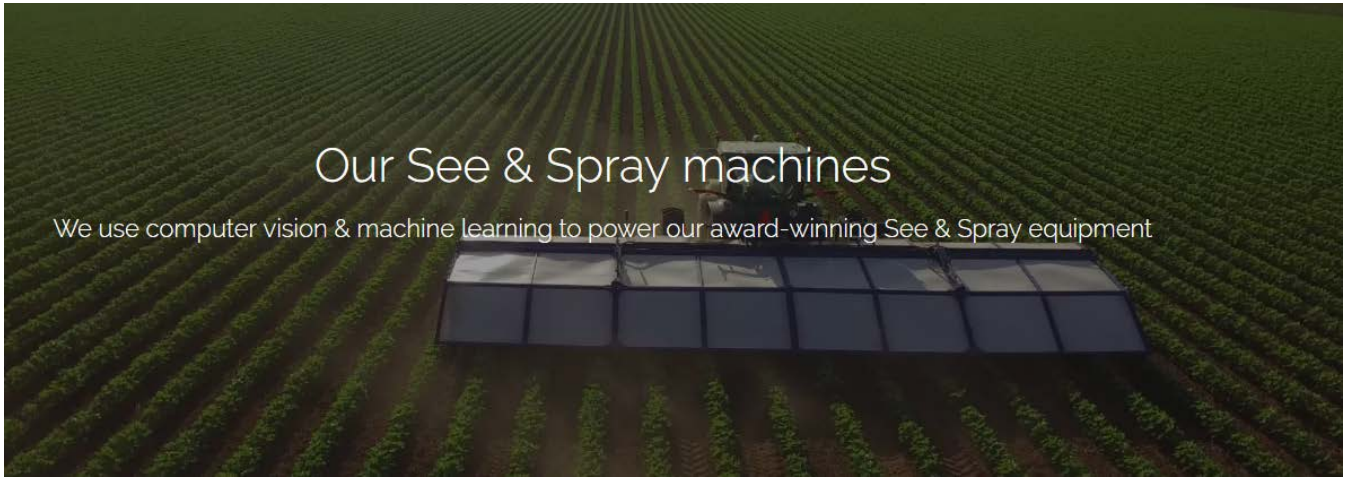
Follow-on funding

Per data from CB Insights and Pitchbook:

For all portfolio companies since 2014 shows (as of January 2020), based on public data:

- ✓ $9 billion in follow-on (equity) financing
- ✓ 107 successful exits (acquisitions, mergers, IPOs)
- ✓ (for reference, NSF funding for SBIR/STTR over the same time period was ~ $1 billion)

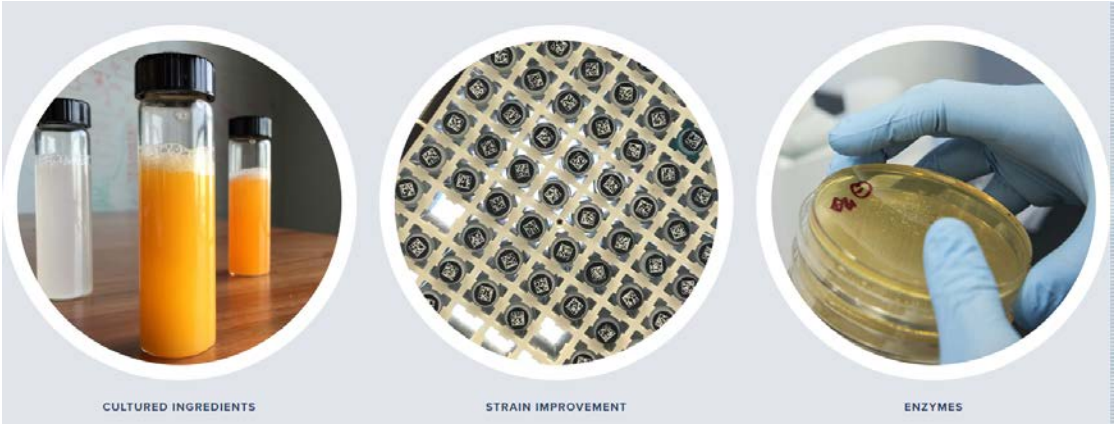
Recent success stories: Blue River Technology



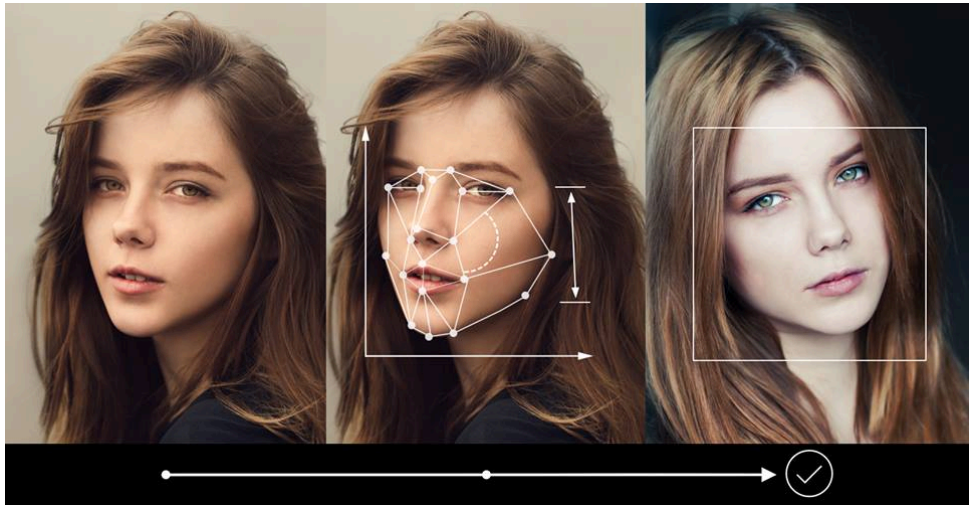
BLUE RIVER TECHNOLOGY

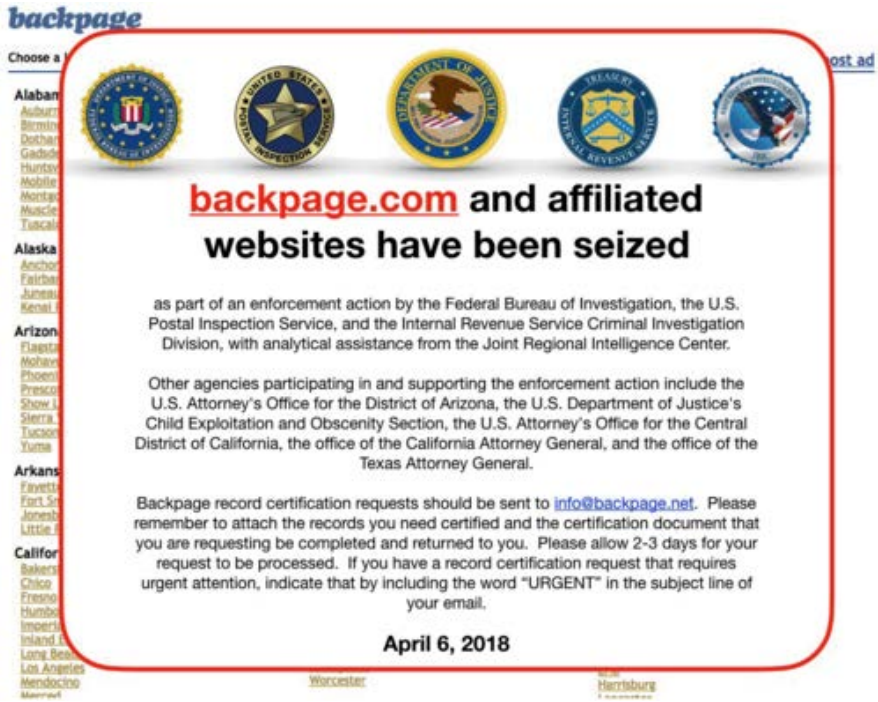
Recent success stories: Ginkgo Bioworks

GINKGO BIOWORKS
THE ORGANISM COMPANY



Recent success stories: Marinus Analytics





MARINUS ANALYTICS