Bringing Home the BEACON

James A. Foster
2 December 2010
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Outline

- What is an NSF STC? What is BEACON?
- What science does BEACON support?
- What else does BEACON do?
- How is BEACON organized?
- How do I apply for BEACON funding?
Outline

What is an NSF STC? What is BEACON?
What science does BEACON support?
What else does BEACON do?
How is BEACON organized?
How do I apply for BEACON funding?
Science and Technology Centers

Build large, nationwide consortia to create new knowledge and technology that can change “the big picture”

- build intellectual and physical infrastructure within and between disciplines
- conduct world-class research through partnerships of universities
- enable and foster excellent education, integrate research and education, and create bonds between learning and inquiry
- involve groups underrepresented in science and engineering


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Science in BEACON

Mission: *illuminate and harness the power of evolution in action to advance science and technology and benefit society*

Cross Cutting Themes:
I. biological evolution,
II. digital evolution
III. evolutionary applications in engineering

Thrust Groups:
I. Evolution of Genomes, networks, evolvability
II. Evolution of Behavior and intelligence
III. Evolution of Communities and collective dynamics

Weekly seminars: Friday, 12.30, skype room
Topics: 1st: general; 2nd TG I; 3rd TG II; 4th TG III

http://beacon-center.org/
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Other BEACON activities

Education and Human Resources Development
- sharing classes across the network (BCB)
- faculty and postdoc mentoring
- k-12 outreach

Diversity
- NCA&T, a “Historically Black College”
- Each institution has unique minority populations
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Thrust Group 1 - Evolution of Genomes, Development, and Evolvability

Balancing robustness and evolvability
Epistasis and robustness in evolution (Robert Heckendorn)
Selective advantages of cooperation in dynamic environments (Terence Soule)

Thrust Group 3 – Evolution of Communities and Large Group Dynamics

Evolution of cooperation and group problem solving
Evolution of plasmid host range (Eva Top)
Modeling species interaction (Steve Krone)
Genetic variation, cooperation, and motility in Myxococcus xanthus
(Patricia Hartzell, Alan Caplan)

Understanding the dynamics of niche-invasions and emerging speciation
Gene introgression and hybridization (Jack Sullivan)
Comparative and functional genomics of an emerging pathogen (Bree Rosenblum)

Speciation and the formation of ecological communities
Experimental metagenomics (James Foster, Mitch Day)
Evolution of antibiotic resistance in biofilms (Luke Harmon)
Diversification of copapods (Holly Wichman)
The Human Microbiome (Larry Forney)
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Who is “in” BEACON?

BEACON: Organization

- Exemplars
- Researchers
- Expansion

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Who is “in” BEACON?

BEACON: Organization

Exemplars

Researchers

Expansion

BEACON and IBEST (©2010, james a. foster)

Initiative for Bioinformatics & Evolutionary Studies
BEACON and IBEST (©2010, james a. foster)
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Available BEACON funding

✧ Due: January 10
✧ Funding starts in fall (August) for 1-2 CY (time to recruit)
✧ How much funding: $2.5M/yr (5 institutions)
✧ What to propose: collaborative work between BEACON members (including new ones)
✧ Who can apply?
  • anyone currently on BEACONs list of participants
  • Anyone with a project collaborating with above
  • Anyone who can make a good case to me
✧ Evaluation criteria:
  • Intellectual Merit: team science that is good, relevant; probability of external funding later
  • Broader Impact: contribution to EHRD, Diversity, Knowledge transfer; degree of multi-institutionality
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**intellectual merit**
- scientific strength
- centrality to BEACON mission
- probably of follow-on external funding
- amount of multidisciplinarity

**broader impacts**
- impact on education and human resource development
- knowledge transfer to industry
- impact on BEACON diversity goals
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Proposal review process

BEACON : Funding review process

submission (due Jan 10)
- PI name, affiliation; project title
- 2 page (max) proposal
- 1-2 page biosketch
- type of request (TG I, II, III; EHRD; Diversity; “Other”)
- 250 word abstract
- project description
  - goals; methods; intellectual merit; broader impacts
  - budget: salary/tuition; travel; materials & supplies; other (sequencing and computer services)

internal committee + 2 external reviews
review by executive committee & recommendation to director (Feb 7)
director decision (Feb 14)
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