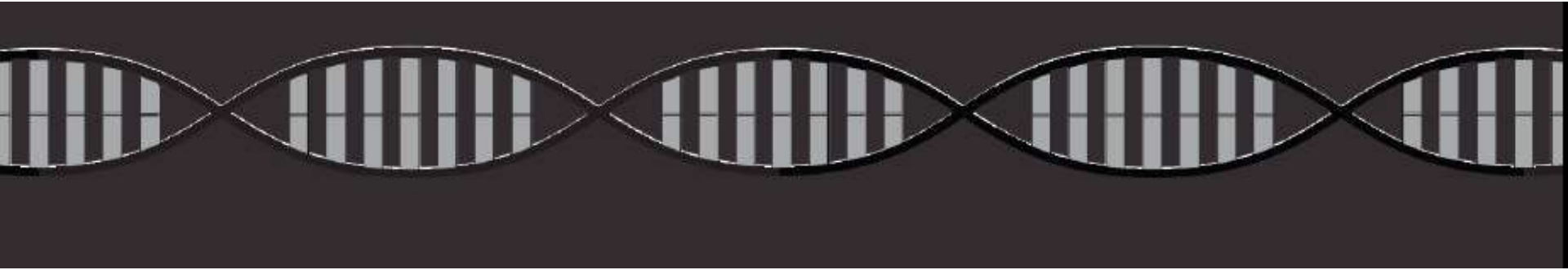


Catalyzing New Interdisciplinary Research: building bridges between genomes and ecology

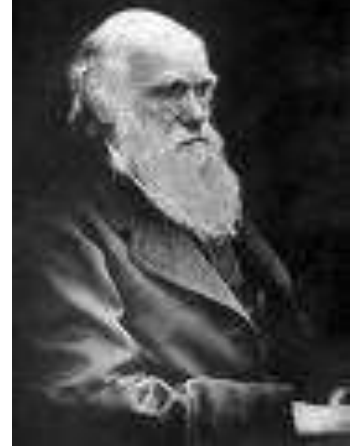


Bette Loiselle
Center for Latin American Studies &
Department of Wildlife Ecology and Conservation
University of Florida



A little background information first.....

Sexual selection is a potent evolutionary force that enhances traits of organisms....



Darwin 1871

Male-male competition



Lucanus cervus males

Female choice



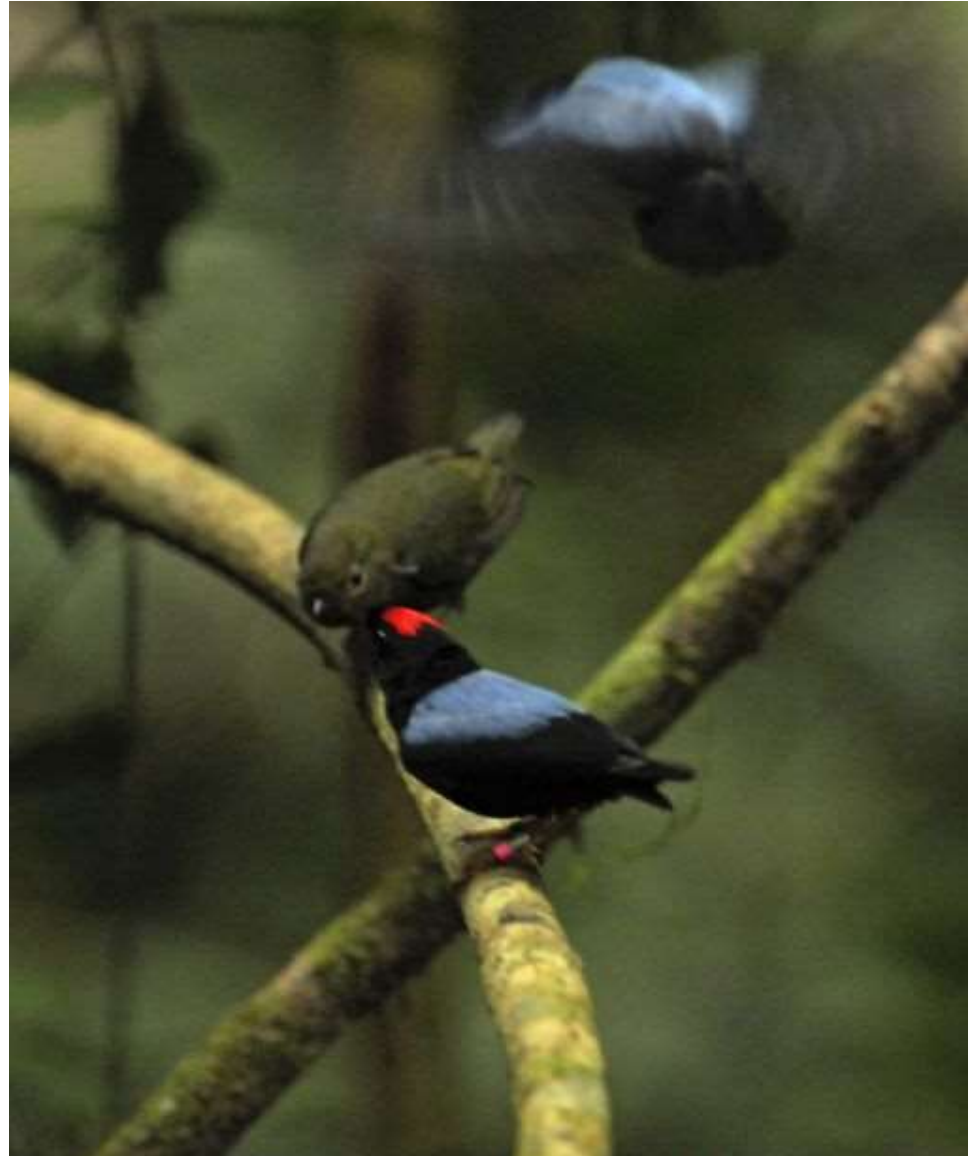
Pavo cristatus male

Manakins are a model group to study sexual selection

Relatively few males are successful and females are “choosy”



"Well, look who's here ... God's gift to warthogs."





Club-winged Manakin – “singing wings”
K. Bostwick, Cornell University

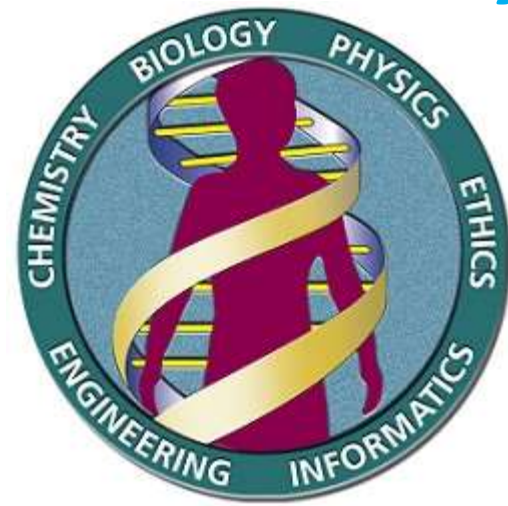


Lance-tailed Manakin – cooperative dance
E. Duval, Florida State University

And now we have a genome.....

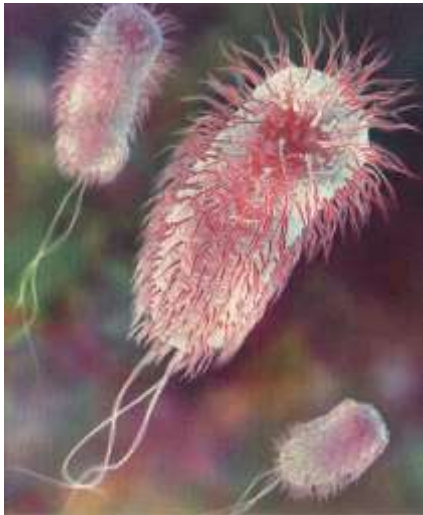
The Human Genome Project

- initiated in 1990, 13 yrs, ca. \$3.8 B
- led to genomes of model organisms



www.rice.bio.indiana.edu

fruit fly



dco.gl.ciw.edu E. coli



www.avesphoto.com



www.sciencedaily.com

lab mouse

Golden-collared Manakin
genome sequenced by
Beijing Genome Institute

NRLI Practicum: Facilitate 3-day Meeting

NESCent Catalysis Meeting: “Genome-enabled Research on Manakins”, 16-18 January 2013

Goal: Transform current independent research on manakins into an interactive, synthetic enterprise to reveal how sexual selection acts at the genomic level to influence the evolution of many biological phenomena

Objectives:

- Significantly expand research network
- Chart strategy to unite efforts, develop genomic resources, and identify integrative research questions that require novel interdisciplinary approaches

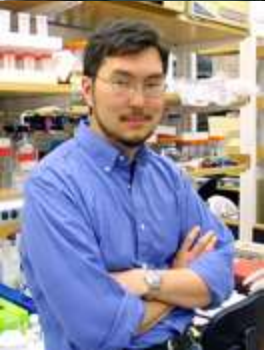


National Science Foundation
WHERE DISCOVERIES BEGIN



Stakeholders and their Interests

- 25 participants
- 6 Professors, 4 Assoc. Prof., 5 Asst. Prof., 4 Post-docs, 6 PhD students
- 7 nationalities (Brazil, Bolivia, Canada, Colombia, Kazakhstan, UK, USA)
- 11 men, 14 women
- 11+ disciplines: behavior, ecology, evolutionary biology, phylogenetics, population genetics, developmental biology, functional morphology, neurobiology, physiology, bioinformatics, computational biology



Process: Steps and Timelines

Pre-meeting:

- **Idea** generated in airport waiting lounge (August 2011)
- Recruit participants, write & **submit** grant (July 2012)
- Grant awarded - **\$\$** (Oct 2012)
- Confirm **participants** & develop 1st agenda (Nov 2012)
- Develop & distribute pre-meeting **survey** (Dec 2012)
- **Prepare** Icebreaker and Overview talks (Dec 2012)
- Develop **process agenda** (early Jan 2013)
- Develop **final** meeting agenda (early Jan 2013)
- Final details and **logistics** (mid Jan 2013)

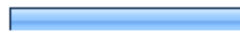


Key Step: Pre-meeting Survey

What was the knowledge base of stakeholders?

2. My knowledge of manakin behavior/ecology is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



3. My knowledge of manakin genetics/systematics is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



4. My knowledge of developmental biology is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



5. My knowledge of physiology is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



6. My knowledge of genomics is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



7. My knowledge of bioinformatics is:

Very familiar



Familiar



Somewhat familiar



Not at all familiar



Key Step: Pre-meeting Survey

What did stakeholders want to learn from others?

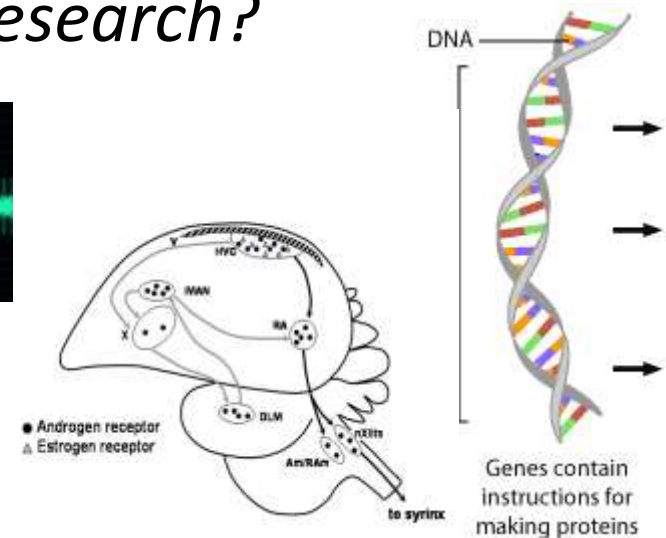
If you consider yourself a manakin biologist, what do you want to know about genomics and its potential application to advance your research on manakins?

If you consider yourself a genomicist, what do you want to know about manakins to understand how this animal system might advance your genomics research?



Heart rate:
563 bpm vs 1017 bpm
resting vs during displays

Barske et al. 2011



Key Step: Detailed Process Agenda

Topic: Sharing information and building community (Day 1 – morning/early afternoon)

Time	Outcome	Process	Notes	Leaders/Facilitators
9-9:45 9:45-10 (60 min)	Start meeting on an upbeat tempo	Introductions of Leaders/Key <u>NESCent</u> staff & Review Agenda	Have agenda posted on wall (flipcharts) – hand-out list of participants/agenda; Review overall goals of the meeting and what we want to accomplish by 3 PM on day 3 Have <u>manakin</u> phylogeny posted on wall with space to indicate data/genetic data available	All PIs (Bette/Stephanie lead) <u>Manakin</u> phylogeny: Kim <u>Bostwick</u> (introduce phylogeny in aft talk)
10-12 (break : 11-11:15) (120 min)	Begin to forge new links between manakin and genomic researchers	Icebreaker - <u>Pecha Kucha</u> talks – 4 min introductory talks Take 15 min break ½ way through	Have “batting order” (random, PIs go first) decided ahead of time and emailed to participants at least 48 hrs in advance (participants need to upload talks to <u>dropbox</u> site prior to 16 Jan morning; Upcoming speaker moves to “chair in waiting”	Emily: introduce part 1 Alice: introduce part 2 Bette: manage computer part 1 XXXX: manage computer part 2
11:50-noon (10 min)	Create team norms	Activity: Reach group consensus on “ <i>What rules should the group impose on itself to make sure we have a positive climate for working together to achieve the</i> ”	Need flipchart for MG Norms – have list of <u>NESCent</u> suggestions ready to go on flipchart for editing by group	Bette

Thanks Joy – your session came at a perfect time!!

Key Activity: Icebreaker

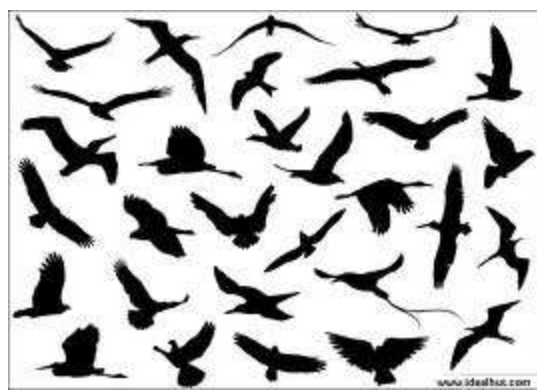
Meeting at NESCent (3 full days):

The PechaKucha Icebreaker (morning, day 1)



The PechaKucha Icebreaker:

- 12 slides x 20 sec (4 min)
- images automatically advance every 20 sec
- set instructions (where, what, how, share something)
- fun exercise that promotes creativity



Who started
it all →

nerd nite



**be there
and be
square.**



**It's like the
Discovery
Channel®...with
beer!**

Obsession
begins at a
young age →



↑
Even
concert
violinists
mature

Key Activity: “Dummies” Talks

Meeting at NESCent (3 full days):

Leveling the Playing Field (afternoon, day 1)

15-minute Genomics



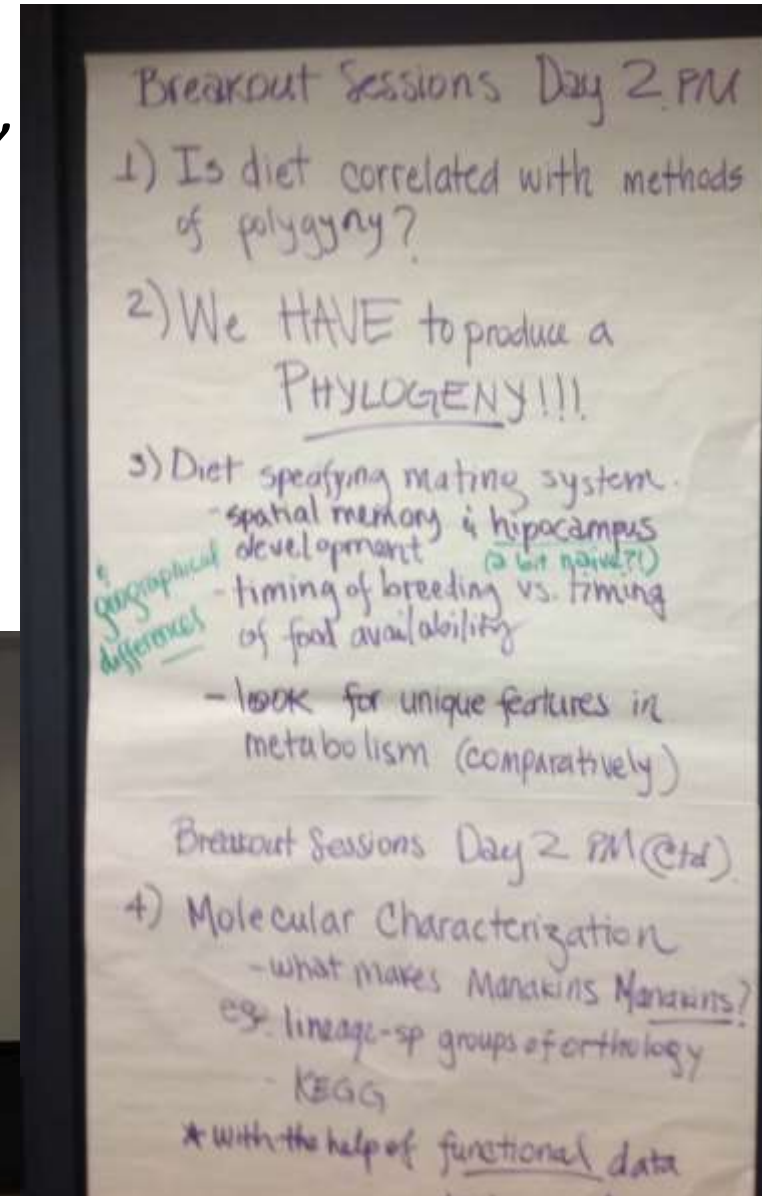
Brant C. Faircloth

University of California - Los Angeles

Key Activities: Brainstorming, etc.

Meeting at NESCent:

*Brainstorming, Reporting, Reflecting,
Facilitated
discussion,
Synthesizing,
Writing (day
1 to day 3)*



Key Activities: Breaks and Social Activities

Meeting at NESCent:

Breaks and small talk (every 2-2.5 hrs)



Evening socials



Progress: Accomplishments



Post-Meeting Survey: did we achieve our objectives?

10. I established new connections with manakin researchers at the Manakin Genomics NESCent Catalysis meeting. Please select the answer that best responds to this statement.

		Response Percent	Response Count
Strongly agree		83.3%	15
Agree		16.7%	3
Neutral		0.0%	0
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			18
skipped question			0

Expand manakin research network



11. The Manakin Genomics NESCent Catalysis meeting resulted in helping me better understand manakin biology and the existing ecological, behavioral, demographic and physiological resources available on this system.

		Response Percent	Response Count
Strongly agree		61.1%	11
Agree		38.9%	7
Neutral		0.0%	0
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			18
skipped question			0

Better understand manakin system

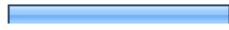

Post-Meeting Survey: did we achieve our objectives?

12. At the Manakin Genomics NESCent Catalysis meeting we made progress towards a plan to develop shared genomic resources within the manakin system.

		Response Percent	Response Count
Strongly agree		61.1%	11
Agree		38.9%	7
Neutral		0.0%	0
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			18
skipped question			0

Progress for
developing shared
resources

13. At the Manakin Genomics NESCent Catalysis meeting we identified a few multi-disciplinary research topics that apply genomic techniques. Please select the answer that best responds to this statement.

		Response Percent	Response Count
Strongly agree		50.0%	9
Agree		50.0%	9
Neutral		0.0%	0
Disagree		0.0%	0
Strongly disagree		0.0%	0
answered question			18
skipped question			0

Identified new
research topics

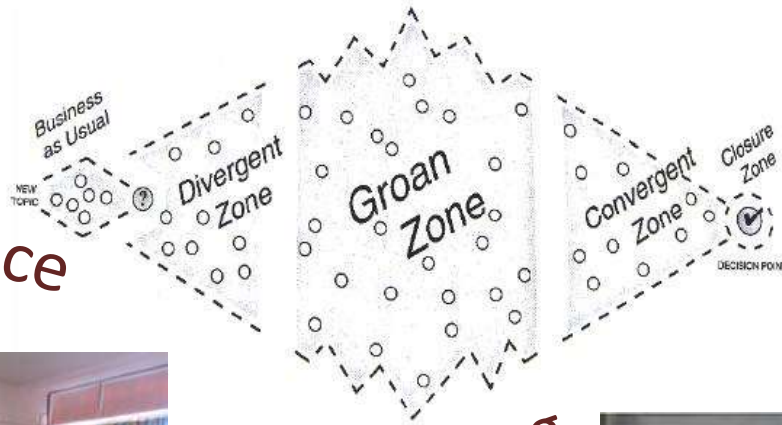
Progress: Next Steps

- NSF Dimensions of Biodiversity grant (with Brazil) (due 6 May 2013) (3+ video-conf., writing group)
- NSF RCN grant (due August 2013) (first steps in early May)
- Review papers (leaders identified):
 - “What makes manakins special?”*
 - “So now we have a genome, so what?”*
 - “Phyloethology of manakins”*
- NESCent Working Group (waiting for call for proposals)
- Pooling resources to produce 3-5 more genomes (in progress, negotiations with major sequencing developers)
- Shared database development
- Annotation of genomes using crowd-sourcing techniques

NRLI Concepts and Skills

LISTENING

Silence



Listing Ideas

FACILITATING
OPEN DISCUSSION



Stacking

Summarizing



Switching

Paraphrasing

Structured Go-Arounds

BRAINSTORMING

PROCESS AGENDAS

Reflections



!!!!Thank You NRLI Project Team
& NRLI XII Classmates !!!!



& the manakinologists



Manakins have also been an inspiration to pop culture

