- Announcements
- Lab Practical (~40 min)
- Pre-lab Lecture
  - Module 1 Overview
  - PCR
  - Module 1 Assignments
  - Today in Lab: M1D1

Announcements

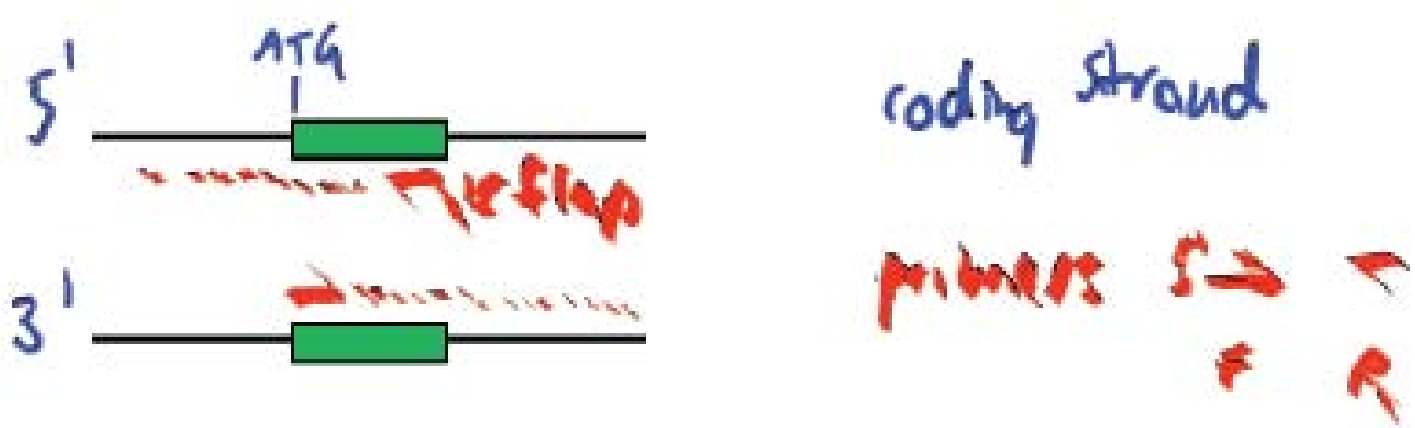
- BE (and other) seminar series:
  - Seminar posters across from BE HQ on 3rd floor
  - Full schedule linked from BE website
  - Part of professional development
  - Today: on angiogenesis and cancer, 4:05 pm

- Introducing… Christina, your TA for Module 1

Module 1 Overview

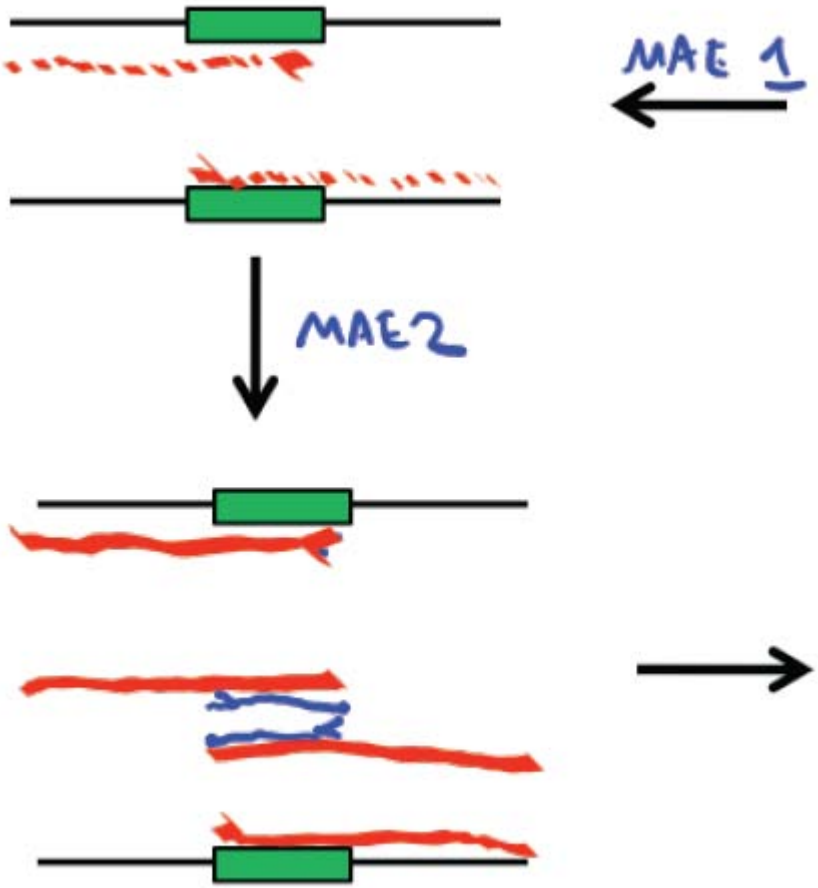
- What is an RNA aptamer?
  - RNA sequence/structure that binds a specific target
- What will we do with them?
  - Study selection/enrichment conditions for a heme-binding aptamer
- Why should we care?
  - Many uses – from probing natural systems to therapeutics

Designing PCR primers



Flap - useful for adding sequence with additional functions

PCR Process



Melt → ~95°C
Anneal → 50's – 60's °C
Extend → 72°C

Depends on T_m of primers
5 °C below T_m

— too long
— desired product

PCReaction

Component	Function
Primers	Select and initiate new DNA strands
DNA polymerase (Taq)	Catalyzes DNA elongation
dNTPS	Make up the new DNA
Template	Provides desired sequences
Buffer; Mg^{2+} (co-factor)	Provides needed chemical environment

Mod 1 Written Assignments

- Lab report (15%)
  - Traditional format (intro, methods, etc.)
  - Can be revised
  - WAC training begins next time
- Computational assignment (5%)
  - Practice with three online tools
  - Short-answer questions and figures
  - Not subject to revision

Mod 1 Oral Assignment

- Journal club (10%)
  - Purpose: summarize a recent research article
  - Sign up for Day 6 (Feb 25/26) or Day 8 (Mar 4/5)
  - Paper list available next Monday
- Preparation
  - Practice discussing an article in-class on Day 3: start reading the paper this weekend
  - WAC training will be on Day 5 (Feb 23/24)
- Presentations will be videotaped, reviewed

Participation self-assessment

- Hand in at end of each module
  - Opportunity for reflection
  - Holistic view of your contributions

	• I missed more than one lecture.	<=5 _____
Participating in pre-lab lecture	• I was attentive and made regular contributions during (all or nearly all) pre-lab lectures. • I mostly paid attention, but rarely (8) or never (7) actively participated in lecture. • I was late and disrupted lecture more than once.	10 7 or 8 <=5 _____
Lab community contributions	• My group posted our clearly labeled data to the *Talk* pages in a timely fashion. • During journal article discussions in class, I was prepared and substantially participated. • After journal club or oral proposal talks, I asked questions of my peers.	<=10, depending on extent of contributions: _____
Other (above	• I investigated and shared some interesting research	Up to 4 pts.

Today in Lab: M1D1

- Set up PCR of “mock” library:
  - 6-5 (non-binder) and 8-12 (heme aptamer)
  - Change pipet tips between samples, primers, etc.
  - Keep PCR tubes cold!
  - Write small *directly* on the PCR tubes – do not put sticky labels in the PCR machine.
- Computational exercises
  - Primer analysis → required
  - Sequence alignment → start on M1 assignment

20.109 Laboratory Fundamentals in Biological Engineering
Spring 2010