- 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 $\rightarrow$ ~95°C
Anneal $\rightarrow$ 50’s – 60’s °C
Extend $\rightarrow$ 72°C

Depends on $T_m$ of primers
5 °C below $T_m$

- too long
- desired product
<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
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<tbody>
<tr>
<td>Primers</td>
<td>Select and initiate new DNA strands</td>
</tr>
<tr>
<td>DNA polymerase (Taq)</td>
<td>Catalyzes DNA elongation</td>
</tr>
<tr>
<td>dNTPS</td>
<td>Make up the new DNA</td>
</tr>
<tr>
<td>Template</td>
<td>Provides desired sequences</td>
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<tr>
<td>Buffer; Mg^{2+} (co-factor)</td>
<td>Provides needed chemical environment</td>
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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

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