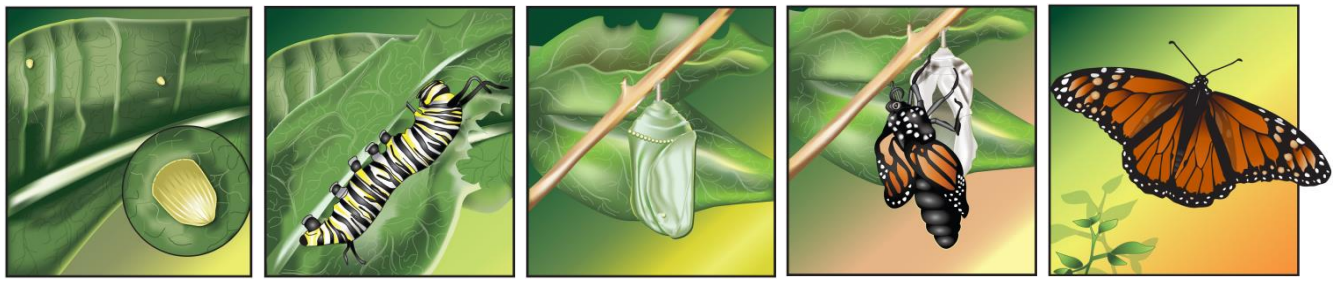

Beginning

Interview

Agree to collaborate

Establish mutual expectations

Develop research question(s)

Begin to read primary literature

Discuss project design, anticipated outcomes, & significance with mentor

Start a lab notebook

Become familiar with the physical research environment

Write a research proposal/literature review

1

Mismatch between mentee & mentor, project, or laboratory

Discovery

Integrate into lab

Develop a regular work schedule

Develop relationships & trust

Continue to read

Discuss research with peers

Learn technical skills & protocols

Ask conceptual & methodological questions

Begin to collect data

Learn to interpret statistics

Give a presentation about project

2

Feeling overworked or overwhelmed by expectations

Boredom with project or protocols

Inability to see the "big picture"

Loss of interest

Productivity

Collect & process data, troubleshoot independently

React to setbacks & obstacles

Know research topic well enough to explain it

Use literature as a resource

Display increased motivation & independence

Create a curriculum vitae

3

Discouragement due to setbacks

Conflicting time demands

Dislike of statistics

Disinterest in theoretical components

Fear of writing or presentation

Loss of interest

Change in career plans

Emergence

Exhibit curiosity & sustained passion for project

Generate additional research questions

Discuss research with senior scientists

Initiate discussions with mentor about achieving goals

Decide to pursue a research career

Seek advice on potential graduate programs

4

Lack of internal drive or confidence

Conflicting time demands

Inability to extrapolate beyond current project

Frustration with data analysis & writing

Inability to grasp broader impacts

Burn-out or loss of interest in project

Change in career plans

Maturation

Appreciate broader impacts of work

Integrate results with theory

Exhibit creativity & independence

Seek opportunities to present research

Prepare & submit a manuscript

5

Lack of confidence or creativity

Frustration with the publication process

Fear of an uncertain future

Change in career plans

Figure 4

Edwards et al., 2011, BioScience, 61(4):301-311.