

**North Dakota State University**  
**PLSC 731: Plant Molecular Genetics**  
**Spring 2020**

**On-Line Learning Study Guide**  
***Plant Non-Coding RNAs***

The following is your on-line study guide for the topic of “**Plant Non-Coding RNAs**”. You have access to the following resources at this WWW site:

- **Highlighted .pdf Notes** (used in the on-line lecture)
- **On-Line Lecture**
- **YouTube Videos (3)**
- **Manuscripts (1)**

**Learning Objectives**

1. Understand the **major classes of plant non-coding RNAs** and general process used to **synthesize each class**.
2. Understand **source sequences** used by RNA polymerases to synthesize the **primary transcript** used to develop the final non-coding RNA.
3. Understand the differences in controlling gene expression via mRNA **slicing** and **disruption of translation**.
4. Explain the steps of **plant miRNA synthesis**.

**Activities**

1. View the **On-Line Lecture** which is ~1 hrs long (if you view it without stops). I would suggest that you first print out the **Highlighted .pdf Notes** and go over them before watching the lecture. This way, in general, you will be familiar with the material that will be covered in the lecture.
2. View the YouTube general instructional and animations on non-coding RNAs.
3. Read the paper describing miRNA control of grape berry color.

**Reflections on the Manuscripts**

During (and after) reading the manuscript, develop and consider the following:

- Create your own short summary of plant non-coding RNA from the information provided in the introduction section.
- Summarize the used steps to discover why different grape berry types have different flavonoid compositions
- Study in detail the “*miRNAs target unique motifs of MYB transcription Factors*” and “*Differential accumulation of MYB RNAs and proteins between grape cultivars*” subsections in the Results section of the paper to understand the role of miRNAs in grape flavonoid composition and relate this to the major points in the Introduction section.
- Consider the major conclusions in the Discussion section and relate those to specific research results.

**Be prepared to be assessed with respect to your understanding of the learning objectives by *Thursday, April 30, 2020.***