

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

On-Line Learning Study Guide
Plant Transcription, Transcription Factors, and Chromatin Remodeling

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

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

Learning Objectives

1. Understand the **major steps and factors** required for the synthesis of hnRNA and the **post-transcription steps** necessary to produce a mRNA.
2. Understand how regions in the upstream region are determined to control specific levels of expression by using the **promoter bashing** technique.
3. Understand fully the **role of transcription factors** in building and stabilizing the molecular machinery necessary for transcription.
4. Explain **the steps of chromatin remodeling** and why it is necessary for transcription.

Activities

1. View the **On-Line Lecture** which is ~1.5 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 instructional animations on transcription.
3. Read the paper describing the use of plant molecular genetic techniques to clone the *GLW7* QTL in rice.

Reflections on the Manuscripts

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

- Create a table that summarizes the major steps used to clone the *GLW7* QTL in rice .
- Summarize the data used to determine a new grain size QTL was located on chromosome seven and the QTL interval contained 11 candidate genes.
- Consider the research results used to consider *Os07g505200* as the major candidate gene.
- Consider the experimental evidence that enabled the authors to conclude the transcription factor encoding-gene *OsSPL13* was a factor in controlling seed size and yield in rice.

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