



UNIVERSITY OF
ARKANSAS

**Graduate School
& International Education**

Thesis and Dissertation Guide

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INTRODUCTION

Congratulations on reaching this stage in your academic career! This *Guide* will assist you in preparing your master's thesis or doctoral dissertation for final submission to the world-wide-web as part of the University of Arkansas Electronic Thesis and Dissertation Collection. The Graduate School wishes you every success in preparing your document, and we are pleased to serve as a resource throughout the process.

The purpose of this *Guide* is to acquaint you with the Graduate School's requirements for the format of your thesis or dissertation and explain the submission process. It is your responsibility as a student to follow the formatting guidelines and submission instructions found within. We reserve the right to refuse a document that does not adhere to formatting guidelines.

The subject of your thesis/dissertation should be current and pertinent to your discipline. Your document should demonstrate your capacity for research and original thought. It should be written in English, employ correct grammar, and cite sources according to the style manual recommended by your program. Your thesis/dissertation not only represents you, it also represents your advisors, your department, and the University.

Remember to follow the formatting guidelines found in *the most current Thesis and Dissertation Guide, according to the semester/year of your graduation*. The most current *Guide* is always available for download on the Graduate School website: <https://graduate-and-international.uark.edu/graduate/current-students/student-resource/commencement-graduation.php>

For assistance with the writing process, we recommend consulting Writing Support at CLASS+: <https://class.uark.edu/>

Feel free to contact the thesis/dissertation office within Graduate School and International Education for further information:

- gradtad@uark.edu
- (479) 575-4401
- Gearhart Hall 207/208

OVERALL SUBMISSION PROCESS

Preparation:

- Check final thesis/dissertation submission date for your graduation semester and schedule defense at least 2 weeks prior. Doctoral students must announce defense via <https://graduate-and-international.uark.edu/graduate/current-students/dissertation-defense.php>
- Make sure your thesis/dissertation title and committee forms are on file in the Graduate School: <https://graduate-and-international.uark.edu/graduate/current-students/forms.php>
- Initiate formatting pre-check process by emailing paper to the Graduate School at gradtad@uark.edu prior to defense. You will receive a pre-check form stamped “Approved” once process is complete.
- Gather necessary documents for submission packet (see below)
- Successfully defend paper and obtain all required signatures in submission packet

Submission Packet:

Digital/scanned/stamped signatures on documents below are not acceptable. If a committee member/dept. head is not available to sign in person, please contact the Graduate School for instruction at gradtad@uark.edu or 575-4401. After receipt of a pre-check stamped “Approved,” you (or your designee) may present the submission packet:

1. Pre-check form stamped “Approved”
2. Thesis/Dissertation Submission form: <http://graduate-and-international.uark.edu/graduate/current-students/forms.php>
3. Intellectual Property Disclosure form: <http://graduate-and-international.uark.edu/graduate/current-students/forms.php>
4. Thesis/dissertation title page with original committee signatures
5. (*Doctoral students only*) Survey of Earned Doctorates certificate: <https://sed-ncses.org/GradDateRouter.aspx>
6. (*Microelectronics-Photonics students only*): Software/Turnitin signature page

Submission:

- Complete submission packets **must be presented in person by student or his/her designee** to the thesis/dissertation office (GEAR 207/208)
- Incomplete or mailed/scanned/faxed submission packets *will be returned to sender*
- Graduate School *does not require* a paper copy of your thesis/dissertation
- On receipt of submission packet, student receives instructions to upload thesis/ dissertation to ProQuest (*and must do so within 24 hours or by 4:30pm on final due date, whichever comes first*). This completes the student's publication agreement. No fees are associated with this process unless student opts to copyright, purchase thesis/dissertation copies, or allow open access publishing.
- Papers submitted to ProQuest after 4:30pm on the final due date *will not be accepted* and student’s graduation date will automatically roll to the following semester.

REQUIRED PRE-CHECK PROCESS

- Submit a copy of your thesis/dissertation to the Graduate School to allow for a check of formatting as early as possible and *at least two weeks before defense*
- You must continue the pre-check process until formatting is fully approved; multiple checks are usually necessary
- Formatting must be approved by the Graduate School before final upload to ProQuest

E-Mail

- Send your Microsoft Word or PDF document to gradtad@uark.edu
- Expect 0-2 business day turn around for pre-checks during low volume time
- Expect 3-5 business day turn around for pre-checks during high volume time (the 2-3 weeks prior to submission deadlines)
- For larger files, use the University's drop box at <http://its.uark.edu/>
- HINT: Documents may appear differently to reviewer if created on a Mac. We recommend using a Windows based computer for final revisions in order to maintain consistency.

Walk-in

- Send your Microsoft Word or PDF document to gradtad@uark.edu and walk in for a face to face pre-check at your convenience
- Our office is open 8am to 5pm, M-F; we do not schedule appointments
- Pre-check process is approximately 30 minutes
- Wait time is likely within 2 weeks of submission deadline
- We cannot check papers on external storage devices for security reasons
- Students may bring laptops for real-time revisions
- We do NOT require a hard copy of your document at any time

OVERALL FORMATTING

Page Order

Front Matter:

- Title Page (single space each section, evenly distribute sections down the page; see sample page for exact formatting)
- Abstract (350 word max, double space)
- Copyright (optional, single space, no lower than halfway down the page; see sample page for exact formatting)
- Acknowledgements (optional, double space)
- Dedication (optional, double space)
- Table of Contents (main chapter headings and references at minimum; format per your style manual; starts with Intro/Lit Review/Chapter 1 as page 1)
- List of Tables/List of Figures/Abbreviations (optional)
- List of Published Papers (required if one or more chapters has been published or submitted for publication)

Body:

- Introduction/Literature Review/Chapter 1 (double spaced)
- Remaining chapters/sections (double spaced)
- Bibliography/References/Works Cited (each entry single spaced, double spaced between entries)

Back Matter:

- Appendix (if applicable; includes any supplemental information, i.e. research protocol approval letters, excess tables/figures, questionnaires, etc.)
- Vitae (optional; delete/black out personal contact information for identity protection)

Font

- 11 pt. Arial *or* 12 pt. Times New Roman is strongly preferred, but another font equivalent in scale is acceptable at the discretion of the Graduate School reviewer. Decorative fonts and colored text are not acceptable.
- Use same font/size *throughout the entire paper, including page numbers, headings, and table/figure titles/captions.*
- Footnotes should be sized per your style manual
- Font size **within** a table/figure may be reduced (as long as legible in print and electronic formats) in order to accommodate margins or prevent splitting of table; if reduction isn't sufficient, a larger paper size should be used to accommodate table/figure

Margins

- All pages of the thesis or dissertation must have 1 inch top, bottom, left and right margins
- Excepting the copyright statement page, every page of your document should begin at the top 1" margin (this includes title on title page, headings, lines of text, tables, etc.)
- White space at the bottom of a page is permissible for the purpose of keeping text with tables/figures, to prevent splitting a table, or to prevent orphaning a single line of text

Page Numbering

- Front matter should not be numbered or included in the Table of Contents
- Page numbering begins with the first page of the body of the document (Introduction/Literature Review/Chapter 1)
- Consecutive page numbering continues through to the final page of document, including References and Appendices
- Only Arabic numerals (i.e., 1, 2, 3, etc.) are allowed
- HINT: Page numbers will default to Calibri; be sure to convert back to body text font

Page Number Placement

- Page numbers can be placed top right corner, bottom right corner, or bottom center; choose one location and use consistently throughout paper
- Use default settings of .5" for both header and footer to assure correct placement
- On landscape pages, page number must appear in the same location with the same orientation as portrait pages (if you turned the page counter clockwise to portrait; see example in Sample Pages)
- For landscape pages in Word, find a tutorial here: <https://support.microsoft.com/en-us/kb/211930>

- HINT: For landscape pages, use a text box (minus the border) to cover the existing page number. Place another text box in the correct position, add the page number, then rotate to correct orientation.

Tables/Figures

- Text *within* tables and figures can differ from the body of the paper in font/size, but must be legible both in print and electronic formats
- Color is allowed *within* a table/figure/image
- Titles/captions must remain same font/size as body of paper
- Titles/captions must be single spaced
- Charts, maps, graphs, diagrams, photographs, artwork, etc. should be labeled as figures
- Figure captions should be placed *under* the figure; table titles should be placed *over* the table
- If a table is too long for a single page, place “Table X (Cont.)” at the top left margin of the following page and repeat column/row headings before continuing table (see example in Sample Pages)
- If tables/figures can comfortably share a page with text or other tables/figures, without causing a split table, this is preferable in order to minimize white space
- Table title should always remain on the same page with the corresponding table
- HINT: Turn on the grid lines in the view tab to see where the figures/tables fit

Headings

- Front matter page headings should be consistent in placement, bolding, capitalization, underlining, ie: all caps, all mixed case, all left justified, all center justified, etc.
- All body headings should be consistent in placement, bolding, capitalization, underlining, etc. as dictated by style guide (not required to match style/placement in front matter)

Headers/Footers

- Should not extend beyond the 1” allowable margin
- Running headers are not acceptable, regardless of style manual
- Set at .5” in order to assure correct placement of page numbers

Spacing

- Title page should be evenly spaced so that sections take up entire page
- The body of the document is double spaced
- Abstract, acknowledgments, and dedication are double spaced
- Bibliography/references/works cited: single space each reference and double space between references
- Block quotes are indented and single spaced
- Table and figure captions are single spaced
- Footnotes are single spaced
- Bullet point items are indented and double spaced
- If tables/figures can comfortably share a page with text or other tables/figures, this is preferable in order to minimize white space, as long as it does not create a split table

White Space

- Minimize white space as much as possible
- White space in text of more than three double spaced lines is not acceptable, unless it appears at the end of a chapter
- A single heading/sub-heading at very end of a page (orphaned text) should be moved to the following page
- Acceptable when text is followed by table/figure, etc. that doesn't fit on same page; table title should always remain on the same page with the corresponding table

Justification

- Left justification of the thesis/dissertation is strongly preferred
- Full justification is *allowed only at the discretion of the Graduate School reviewer* (as long as unsightly spaces between words are not present in software's attempt to justify margins of a short line)

Color/Design

- Colored text is only allowed **within** images, tables, figures, graphs, computer code, etc. if student's committee considers it essential to the document
- Decorative lettering, lines, images, etc. are not allowed

Supplementary Material and Size Restriction

- The Supplementary Files step of the ProQuest submission process allows the uploading of supporting files like videos, sound clips and data sets
- Files are submitted to ProQuest along with the PDF version of your dissertation/thesis
- Multiple files are allowed and ProQuest asks that a description of each file (or set of files, if more appropriate) is *included in the abstract*
- The thesis or dissertation PDF along with any supplemental files cannot exceed 1000 MB total, *no exceptions*

Style Guide Requirements

- Use a consistent style throughout the master's thesis and doctoral dissertation
- Acceptable style manuals include but are not limited to: Chicago, APA, MLA
- Style manuals are available in the University Bookstore or in the University Libraries; also see examples here: <https://class.uark.edu/resources.php>
- Style manuals do not supersede *Guide* requirements but can address issues where the *Guide* offers no specific requirement
- The Graduate School reserves the right to reject a thesis or dissertation if a style manual is not followed properly

MISCELLANEOUS

LaTeX and Mac

- LaTeX software can create formatting issues when converted to Word or .pdf; take this into consideration when planning your timeline

- Documents may appear differently to reviewer if created on a Mac. We recommend using a Windows based computer for final revisions in order to maintain consistency and follow formatting guidelines

Committees

- Dissertation/thesis committee forms should be submitted to the Graduate School as soon as your committee is selected (and no later than three months prior to the date of the oral defense); if your committee form has not been submitted at this time, you must do so prior to your first pre-check
- Thesis/dissertation committees should be comprised of *a minimum of three faculty who hold graduate faculty status at UA*
- Additional members without UA grad faculty status are acceptable with the title of “Ex-officio Member” on the document’s title page
- If a committee member/dept. head is not available to sign submission paperwork in person, please contact the Graduate School for instruction at gradtad@uark.edu or 575-4401

Defense

- Doctoral defenses must be announced at least two weeks prior to defense date: <http://graduate-and-international.uark.edu/graduate/current-students/dissertation-defense.php>
- Students are not allowed to bring snacks, gifts, etc to defense
- Students can defend via electronic means if approved by committee director; the student must also provide to the Graduate School a written/signed statement that he/she is defending remotely

ETHICAL ISSUES

Plagiarism

- Plagiarism is the appropriation of another person’s ideas, processes, results, or words without giving appropriate credit
- The use of a quotation, figure, table, graph or legend directly from a publication that is not cited is also considered plagiarism
- The Graduate School reserves the right to check any thesis or dissertation for plagiarism
- Self-plagiarism occurs when authors reuse portions of their previously published writings in subsequent research papers, without citing the published work
- Consult the Center for Learning and Student Success (CLASS+): <http://class.uark.edu/resources.php> for more information

Copyright Violations, Excessive Use of Materials

- When copyrighted material is used, you must conform to all laws pertaining to the use of copyrighted material
- Use of materials, including figures, legends, and pictures from a publication, even if cited, can be a copyright violation. It is recommended that the student contact the publisher of the document for further instructions on obtaining permission for use

- We highly recommended keeping copies of all associated correspondence/permission; it can be included in your document's appendix, but this is not required
- Consult the Technology Licensing Officer: <http://vpred.uark.edu/units/techventures/> or 479-575-7243 for more information

Citations

- When citing another person's ideas, processes, results, or words, you must consistently follow rules set out by your chosen style manual throughout your document
- All charts, tables, graphs, photos, etc. directly used from another work must be cited in the figure caption (including images of maps derived from internet sources such as Google Maps)
- Permission to reproduce must be obtained for all copyrighted tables, figures, photos; keep copies of all correspondence requesting permission to use
- All original photos must include the name of the photographer in the figure caption of the photo along with the statement "used with permission" or "photo by author"
- Photos of samples/equipment taken by thesis/dissertation author do not require a photo citation

Patented Material

- The use of patented material in a master's thesis or doctoral dissertation is expressly prohibited without the prior consent of the patent holder
- Documentation of permission must be included in paper's Appendix
- Consult the Technology Licensing Officer: <http://vpred.uark.edu/units/techventures/> or 479-575-7243 for more information

RESEARCH COMPLIANCE AND INTELLECTUAL PROPERTY

Research Compliance

- The Office of Research Compliance (RSCP), a unit of the Office of the Vice Provost for Research and Innovation, is responsible for assisting faculty, staff and students in complying with federal and state regulatory requirements for sponsored and unsponsored research and with the associated University policies
- These areas include, but are not limited to Biological Safety, Export Control, Human Subjects, Radiation Safety, Responsible Conduct of Research, Toxic Substances, and Vertebrate Animals
- Theses/dissertations containing research requiring research compliance approval *are required to include a copy of the Research Compliance Protocol Letter (and Modification letter if applicable) as a document in Appendix*. This should be an image of the original letter on University letterhead reduced in size to fit within the required margins
- Student name must appear on protocol letter. If student is working under faculty member's existing approved protocol, he/she must be added to the protocol and complete any required training. *Failure to be added to protocol will restrict student from using research completed as part of his/her thesis or dissertation.*
- Consult Research Compliance: <http://vpred.uark.edu/units/rscp/> for more information

Intellectual Property

- Theses/dissertations containing information relevant to proprietary material or possible patent applications are made available *only* to the members of the review committee
- After the work has been successfully defended, the thesis or dissertation will be available for access only with the express permission of the University of Arkansas Technology Licensing Officer
- Such documents will remain in restricted status and will not be forwarded to ProQuest until the patents have been applied for, at which time, specific authorization for their release will be given by the Technology Licensing Officer
- Consult the Technology Licensing Officer: <http://vpred.uark.edu/units/techventures/> or 479-575-7243 for more information

PUBLISHED PAPERS VS. MANUSCRIPT STYLE

Published/Submitted Papers

- This is a particular thesis/dissertation style whereby multiple individual works are compiled into a single entity; each chapter stands alone as a complete work
- Consult your thesis/dissertation chair and department head/program director before committing to this format in case restrictions apply
- Students wishing to reuse published work without significant modification must use this style

Graduate School requirements for Published/Submitted Paper Style:

- A master's thesis in this style may consist of one or more published/submitted papers
- A doctoral dissertation in this style must consist of at least two papers
- Thesis/dissertation must include an overall abstract
- Thesis/dissertation must include a separate "Introduction," which presents the topic of the overall paper and explains the rationale for compiling several articles into one document
- Thesis/dissertation must include a separate "Conclusion" which summarizes the overall paper, providing concluding remarks
- If any articles in the document have been published previously or submitted/accepted for publication, proper publication citation is required:
 - The thesis/dissertation must include a List of Published Papers page, listing the original published/submitted articles with a full publication citation for each.
 - The List of Published Papers is placed just before the Introduction (See Thesis/Dissertation Page Order)
 - Each citation should include the chapter number for the specific citation and the status of the article (in press, in review, submitted for review, published etc.)
 - Regarding a previously published journal article, consult the journal's website for proper citation in a thesis/dissertation. It's the student's responsibility to know the requirements for proper usage.
- Each article must be a separate chapter
- References and appendices (if applicable) are included within each chapter

- If the same references or appendices are used in multiple chapters, they must be repeated in each applicable chapter

Manuscript

- This is the standard thesis/dissertation style in which the document is intended to be a whole work that stands together from one chapter to the next
- In some disciplines and journals, students who publish their work are allowed to use that work in their thesis or dissertation with appropriate, journal-specific, citation. This may mean the work is split among different chapters
- In situations where more than one graduate student from the University of Arkansas has co-authored a published paper, it is acceptable for both graduate students with guidance and advice from their major professor(s) (thesis/dissertation advisor) to use the published work in their thesis/dissertation as appropriate for that individual student
- Theses/dissertations are intended as original bodies of work and no student may submit a thesis/dissertation that is identical to, or contains extensive content that is identical to another student's thesis/dissertation
- It is not acceptable for a student to submit a thesis/dissertation that is completely comprised of co-authored works in which they are not the lead author. (Lead author is defined as the writer/researcher who was the major contributor to the work involved in creating the paper)
- Students who are the lead author of an article may reuse the entire article without significant modification using the Published/Publishable Papers style above

PROQUEST SUBMISSION PROCESS

Upload Process

- Receive instructions to submit your document electronically to ProQuest following receipt of submission packet by Graduate School
- A hard copy of your thesis/dissertation is no longer accepted by the Graduate School or University Libraries
- Students have 24 hours or until 4:30pm on the due date, whichever comes first, to upload to ProQuest, completing the publication agreement
- Students who submit to ProQuest after 4:30pm on the due date will not graduate that semester
- No fees are associated with the electronic submission process unless you choose to copyright, purchase copies of your thesis/dissertation, or choose the open access publishing option (all of which are optional)
- Theses/dissertations submitted to ProQuest before the submission packet is received by the Graduate School are denied until required documents are received

Copyrighting

- Theses and Dissertations are protected by copyright law upon creation. However, there are benefits to registering for copyright. For more information:
<http://media2.proquest.com/documents/whycopyright.pdf>

- Theses or Dissertations may be copyright registered during the ProQuest submission process for a charge of \$55
- Copyright statement page must be included in document if you elect to register for copyright (see Sample Pages)
- For further information regarding copyright:
http://media2.proquest.com/documents/copyright_dissthesis_ownership.pdf

Publication Agreement

- Students submitting a thesis or dissertation to ProQuest are required to complete a Publication Agreement at the time of final submission.
- The Graduate School highly recommends researching all publication agreement options early in the thesis/dissertation preparation process
- Students should research journal or publishing company policies if their document includes previously published/submitted works. Each publisher or editorial board of a scholarly or peer-reviewed journal sets policy on prior publication of a work, even if the work was used as a degree requirement.
- For further information, contact ProQuest at 1-800-521-0600 ext. 77020 or review:
http://media2.proquest.com/documents/agreement_traditionalpub.pdf or
<http://www.proquest.com/documents/Dissertations - Open Access Overview.html>

Embargo

- For information: http://media2.proquest.com/documents/umi_embargorest.pdf or
<http://uark.libguides.com/c.php?g=536547&p=4905494>

ScholarWorks@UARK

- This is the University's institutional repository, which is a collection of the research, scholarship, and creative work of the UA community
- Your paper will be included in the repository unless you elect to embargo during the ProQuest submission process
- For more information: <http://scholarworks.uark.edu> or
<http://uark.libguides.com/c.php?g=536547&p=4905494>

MOST FREQUENT ERRORS

Page number font doesn't match document's font	Page numbers often default to Calibri 11, so double check your page numbers
Title page isn't formatted correctly	Follow the example page in Sample Pages for exact formatting
Tables/figures exceed 1" margin	Try turning on gridlines for exact measurement; okay to shrink to fit and/or if text within table/figure is reduced as long as legible
Abstract is too long	Strict 350 word maximum
Table of Contents and/or List of Tables/Figures page numbers don't correspond to page numbers in body	Be sure to double check this, even if you're using automated page numbering
Front matter pages are numbered with Arabic or Roman numerals	Front matter should not be page numbered
Table of Contents includes front matter	Table of Contents should start with Introduction/Literature Review/Chapter 1 as page 1
References are double spaced	Single space each reference , and double space between references
Page number in wrong location on landscape page	Cover current page with white text box, open text box where number should be, add number, and rotate to correct orientation
Text starts too low on page, sits below 1" top margin	Make sure text, headings, titles, figures, tables, etc. begin at top 1" margin; view your paper as multiple pages and scroll through to better review for this
Blue hyperlinks within text	Colored text is not allowed unless within a table/figure. Change blue hyperlinks to black
Document preparation on a Mac	Macs often do not translate well to our Windows based computers; we may see errors not visible on your end. We recommend completing both final edits and upload via Windows based computer.
Document preparation with LaTeX	Students often find it difficult to keep 1" margins as required in the Guide when using this software. Please let us know in advance if you're utilizing LaTeX.
Items on title page and/or headings/subheadings are not true center (generally right of center)	Turn on top ruler, place cursor at beginning of line, and make sure first line indent is set at left margin

SAMPLE PAGES:

- Title page
- Copyright page
- Research safety committee approval letter
- Table continuation
- Landscape page numbering

Thesis or Dissertation Title in Correct Title Case and Single Spaced:
Do Not Bold, Underline, or Put in All Caps or Quotes

A dissertation (or thesis) submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Space and Planetary Sciences

Single space. Line
breaks exactly as
shown. Do not use
initials for degree.

by

Leia Organa
University of Alderaan
Bachelor of Science in Physics, 1977
Tatooine University
Master of Science in Physics, 1983

List name exactly as appears
in UA Connect. Single space.
Line breaks exactly as shown.
Start with first degree earned.

May 2017
University of Arkansas

Single space. Use month/
year of graduation--not
defense or submission date.

This dissertation (or thesis) is approved for recommendation to the Graduate Council.

Shirley Chisholm, Ph.D.
Dissertation Director

Director is listed first and on
his/her own separate row.

Ibtihaj Muhammad, Ed.D.
Committee Member

Yo-yo Ma, M.A.
Committee Member

Harvey Milk, Ph.D.
Committee Member

Sonia Sotomayor, Ph.D.
Committee Member

List each member's name followed by his/her highest
degree earned. Single space the lines/names/titles as
shown.

Center in middle of page, no lower
than vertical center.



Name must appear exactly as
on Title Page. Single space.
Page is placed after Abstract

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This page is required only for
theses and dissertations
requesting copyright.



UNIVERSITY OF ARKANSAS

Office of Research Compliance
Institutional Review Board

February 12, 2016

MEMORANDUM

TO: Student Name
Professor Name

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Approval

IRB Protocol #: 11-11-111

Protocol Title: *Protocol Title*

Review Type: EXEMPT EXPEDITED FULL IRB

Approved Project Period: Start Date: 02/11/2016 Expiration Date: 02/10/2017

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (<https://vpred.uark.edu/units/rscp/index.php>). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 500 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 109 MLKG Building, 5-2208, or irb@uark.edu.

Table 3.1: Regulatory hubs of seed development. 23 regulators (transcription factors) that were found associated with the largest number of coexpressed modules in SANE were selected and listed in descending order according to the number of modules they regulate. Targets of these regulators in the seed and the global network, with absolute Z score > 3 were selected and tested for overlaps with BP terms in the GO database. The score columns represent $(-1) * \log(q\text{-value})$ values from a cumulative hypergeometric test of enrichment. Only the most highly scored gene sets are reported in the table.

Network	Seed		Global	
Transcription Factor	Biological Process	Enrichment Score	Biological Process	Enrichment Score
NAP57 AT3G57150	ribonucleoprotein complex biogenesis	57.05	ribosome biogenesis	72.07
HDT3 (AT5G03740)	ribonucleoprotein complex biogenesis	45.50	ribonucleoprotein complex biogenesis	71.39
AT4G37130	ribonucleoprotein complex biogenesis	40.00	RNA metabolism	35.36
EMB2746 (AT5G63420)	ribonucleoprotein complex biogenesis	56.44	RNA metabolism	29.30
C3H (AT5G60820)	ribonucleoprotein complex biogenesis	12.97	vesicle-mediated transport	10.38
JMJ22 (AT5G06550)	ribonucleoprotein complex biogenesis	36.76	ribosome biogenesis	75.24
WRKY13 (AT4G39410)	immune system process	3.04	N.D	NA
TFIIIA (AT1G72050)	ribosome biogenesis	49.90	RNA metabolism	49.30
VOZ1 (AT1G28520)	ribosome biogenesis	13.30	cellular biopolymer catabolism	4.77
NFD1 (AT4G30930)	ribonucleoprotein complex biogenesis	71.39	ribosome biogenesis	75.24
KAN3 (AT4G17695)	jasmonic acid biosynthesis	4.64	response to salicylic acid stimulus	2.95

Table 3.1 (Cont.)

Network	Seed		Global	
Transcription Factor	Biological Process	Enrichment Score	Biological Process	Enrichment Score
HDT1 (AT3G44750)	ribonucleoprotein complex biogenesis	41.25	ribosome biogenesis	72.44
HAT3.1 (AT3G19510)	RNA metabolism	7.88	RNA metabolism	20.48
FZF (AT2G24500)	RNA metabolism	23.67	ribosome biogenesis	68.91
IAA8 (AT2G22670)	polysaccharide metabolism	5.33	transmembrane receptor protein tyrosine kinase signaling pathway	10.47
SMAD/FHA (AT2G21530)	photosynthesis	54.25	photosynthesis	68.43
AT1G78280	cellular biopolymer metabolism	5.88	ribosome biogenesis	8.46
ZFP4 (AT1G66140)	N.D.	N.A.	ion transport	4.40
TRB1 (AT1G49950)	maintenance of root meristem identity	2.33	protein modification	6.33
SEUSS (AT1G43850)	microtubule-based process	2.71	negative regulation of gene expression	8.25
NAC017 (AT1G34190)	vesicle-mediated transport	4.70	vesicle-mediated transport	11.55
ATU2AF35A (AT1G27650)	RNA metabolism	20.60	RNA metabolism	15.07
AT1G17520	proteolysis	3.39	RNA metabolism	12.81

This is a correct example of a Portrait Page Number
on a Landscape 8.5x11 Page.

To find instructions on how to insert page numbers properly,
Google “How to add a portrait page number to a landscape page.”
You can also include the software type and version you are using to
further tailor the instructions. There are tutorials on the Microsoft
Support website as well as several YouTube videos available.

This is a correct example of the page number placement on a landscape 8.5x14 page.

This is a correct example of the page number placement on a landscape 11x17 page.