

TSGP PhD Qualifying Exam Expectations Guide

Updated 9/2026

Possible Outcomes of the Qualifying Exam:

- **Pass:** Student thoroughly meets the demanding expectations, exhibiting a strong grasp of complex concepts, advanced critical thinking, and significant potential for independent research.
 - **Conditional Pass:** Student demonstrates some strengths but has deficiencies that need to be addressed (e.g., depth of critical analysis, experimental design for an aim, breadth of background knowledge) that require immediate and specific remediation to meet the institution's high standards.
 - Next steps: The committee will provide a written plan and timeline for addressing deficiencies and a process for confirming they have been resolved.
 - **Fail:** Student consistently falls short of the rigorous expectations, indicating insufficient readiness for independent doctoral-level research.
 - Next steps: The committee will decide whether the student is given the opportunity to retake the exam. If a student is required to retake the exam the committee will provide a timeline for completion of the exam.
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Section 1: Written Thesis Proposal Format & Expectations

The written proposal must represent an original, well-conceived, and rigorously designed research project, showcasing the student's ability to identify significant scientific gaps, formulate innovative hypotheses, and develop a comprehensive and feasible research plan.

Format:

- Maximum of 6 single-spaced pages in length, including figures and tables (bibliography is not included in the page limit)
- Written in the style of an NIH predoctoral research grant proposal, including an abstract and sections on specific aims, background and significance, proposed methods and experimental approaches, interpretation of expected results, pitfalls and alternative approaches, preliminary data (although unlike an NIH grant in that extensive preliminary data are not required for the qualifying exam), and bibliography.
- Significance, background and preliminary data together should make up approximately 2 pages in length, with approximately 1.5-2 pages devoted to each of the specific aims, including a detailed experimental plan, expected results and pitfalls and alternative strategies.

Expectations:

Criteria	Unacceptable	Acceptable	Very Good	Outstanding
I. Depth & Synthesis of Background	Superficial understanding; fails to synthesize literature or identify critical gaps.	Adequate background, but lacks depth; limited synthesis of complex concepts.	Very good understanding of relevant literature; synthesizes key concepts and identifies a clear research gap.	Masterful and highly critical synthesis of the literature; identifies profound and novel research opportunities.
II. Hypothesis/ Aims	Vague, untestable, or unoriginal	Hypothesis/ aims are somewhat novel but	Clear, testable hypothesis; aims are	Groundbreaking hypothesis; aims are exceptionally

	hypothesis/ aims.	lack precision or clear testability.	specific, logical, and address the hypothesis.	creative, exquisitely precise, and designed for maximum scientific insight.
III. Rigor & Research Design	Major flaws; design is not rigorous or methods are inappropriate/outdated.	Design is generally sound but lacks rigor; methods are somewhat standard without critical justification.	Rigorous experimental design; methods are appropriate, well-justified, and address key variables.	Exemplary rigor and sophisticated design; integrates best-in-class methodologies and demonstrates exceptional foresight in experimental strategy.
IV. Depth of Interpretation & Anticipation of Challenges	No discussion of results or interpretation; fails to consider challenges.	Limited interpretation; superficial discussion of challenges or alternatives.	Anticipates results and provides reasonable interpretations; identifies some challenges and alternatives.	Foresightful and nuanced interpretation of all potential results; meticulously identifies and devises creative solutions for highly complex challenges.
V. Broader Implications & Future Directions	Fails to discuss broader implications or future work.	Limited discussion of implications; superficial future directions.	Discusses some broader implications and outlines basic future directions.	Powerfully articulates the transformative potential and long-term implications; outlines a visionary and impactful long-term research program.

VI. Command of Scientific Literature & Referencing	Missing or irrelevant references; poor citation practices.	Limited or inconsistently cited references.	Adequate and well-cited references, demonstrating a reasonable literature review.	Exemplary and exhaustive use of cutting-edge literature; references are strategically chosen to bolster arguments and showcase mastery of the field.
VII. Clarity, Cohesion & Professionalism in Writing	Numerous errors; poor writing quality, unreadable.	Frequent errors; significantly impacts clarity and professionalism.	Generally clear and well-written; minor errors.	Exquisitely written; highly persuasive, concise, and elegant prose; embodies the highest standards of scientific communication.

Section 2: Oral Defense of Thesis Proposal Format & Expectations

The oral defense requires the student to articulate, defend, and critically analyze their proposed research with intellectual rigor. It assesses their ability to engage in high-level scientific discourse, demonstrate a comprehensive understanding of their field, and respond adeptly to challenging questions.

Format:

- Oral presentation of a 20-30 minute slide deck based on the written thesis proposal
- Slides should be clear, concise and include relevant introductory figures
- There should be a short introduction describing the background and rationale for the project (3-5 slides suggested), with the main focus of the presentation consisting of specific aims, expected results, alternative approaches and preliminary data (if

there is any)

- The oral defense is followed by questioning of the student and discussion of the proposal by the Committee

Expectations:

Criteria	Unacceptable	Acceptable	Very Good	Outstanding
I. Presentation Delivery & Engagement	Disorganized, unclear, and disengaging delivery.	Presentation lacks flow or clarity; limited engagement with the committee.	Clear and organized presentation; generally good pace and eye contact.	Exceptionally compelling and articulate presentation; captivates the audience and conveys complex ideas with ease and authority.
II. Understanding (Proposal & Field)	Superficial understanding of the proposal and fundamental concepts.	Limited understanding; struggles with conceptual nuances and deeper implications.	Demonstrates a sound understanding of the proposal and core concepts of the field.	Masterful and profound conceptual understanding; connects the proposal to grand challenges and cutting-edge advancements in the field.
III. Advanced Critical Thinking & Problem Solving	Unable to critically evaluate or propose solutions; lacks independent thought.	Struggles with critical analysis; limited ability to formulate	Can critically evaluate aspects and propose reasonable	Exceptional critical acumen; incisively dissects complex problems, synthesizes disparate

		independent solutions.	solutions.	information, and generates highly creative, robust solutions.
IV. Strategic Responsiveness to Complex Questions	Defensive, avoids questions, or provides irrelevant/ incorrect answers.	Hesitant or provides vague answers; struggles with challenging questions.	Answers most questions adequately and directly.	Provides insightful, concise, and authoritative answers to the most challenging questions; adeptly navigates ambiguities and extends discussions creatively.
V. Breadth & Interdisciplinarity of Knowledge	Lacks foundational knowledge; struggles with questions outside narrow focus.	Limited breadth; struggles to connect ideas across sub-disciplines.	Demonstrates good foundational knowledge across relevant biomedical disciplines.	Exhibits an extensive and interconnected understanding of the biomedical landscape; seamlessly integrates knowledge from disparate disciplines to inform discussion.
VI. Intellectual Maturity & Composition	Appears unprepared, unprofessional, or easily flustered under pressure.	Shows signs of stress; some lapses in professionalism or composure.	Generally professional and composed throughout the exam.	Exudes confidence, intellectual maturity, and grace under pressure; demonstrates the highest level of professionalism and poise.

Section 3: Professionalism and Readiness to pursue independent research

These characteristics are soft skills that students are expected to showcase during the qualifying exam and continue to develop throughout the duration of the degree. There should be significant progress made from the time of the qualifying exam to the time of the final defense.

- **A drive for intellectual curiosity & initiative:** Demonstration of intellectual curiosity and ability to take the initiative in the learning process. This should be showcased in the written thesis proposal through an original, well-conceived, and rigorously designed research project. This should be showcased in the oral presentation through an articulate presentation, and critical analysis of the proposed research project with intellectual rigor. Students should be able to participate in high-level scientific discourse, demonstrate a comprehensive understanding of their field, and respond adeptly to challenging questions.
- **Communication Skills:** Explanation of intricate scientific concepts with clarity, elegance, and compelling persuasion to a variety of audiences. Students should continue to develop this skillset by attending scientific seminars, taking the opportunity to present research to a variety of audiences (e.g., seminars, conferences, data club, lecturing in courses, etc), and attending relevant workshops (e.g., Fellowship Bootcamp, etc).
- **Ability to drive independent research projects:** Demonstration of increasing autonomy in formulating a hypothesis, and the design and implementation of experiments and data analysis. Students should be seeking increasing autonomy as they progress through the program by designing and implementing experiments, troubleshooting, ensuring results are reproducible, analyzing data and proposing new experiments with less and less oversight.

Faculty Quick-Guide: Evaluating Qual Exam

Faculty Quick-Guide: Evaluating the PhD Qualifying Exam

Purpose: This sheet helps examiners evaluate if a student possesses the intellectual maturity, critical thinking, and baseline knowledge to transition from a supervised trainee to an independent PhD candidate.

Core Mindset: What You Are Looking For

Do not just look for memorized facts. Look for **scientific maturity**. An ideal candidate does not just present data; they understand the *why* behind their experiments, anticipate pitfalls, and defend their logic under pressure.

Key Evaluation Pillars & Red Flags

1. The Written Proposal (40% Weight)

- **What to Look For:** A clear, novel research gap backed by a deep synthesis of current literature (not just a summary).
 - A logical flow where specific aims directly test a precise, well-formulated hypothesis.
 - Experimental rigor: well-justified methods, proper controls, and a clear understanding of potential alternative outcomes.
- **Red Flags:** Vague or untestable hypotheses; copying standard methods without knowing why; ignoring potential pitfalls or failing to provide alternative strategies.

2. The Oral Defense (40% Weight)

- **What to Look For:** A compelling, authoritative presentation that translates complex biological concepts easily.
 - The ability to think on their feet, handle ambiguity, and answer tough questions directly and concisely.
 - A broad understanding of the biomedical landscape beyond their immediate, narrow project focus.
- **Red Flags:** Becoming overly defensive or evasive when questioned; getting easily flustered under pressure; demonstrating a superficial understanding of core field paradigms.

3. Holistic Research Readiness (20% Weight)

- **What to Look For:** An intellectual curiosity and proactive drive to explore new ideas independently.
 - The autonomy required to lead and drive dissertation research with reasonable oversight.
- **Red Flags:** A passive approach to learning; heavy reliance on a mentor to dictate every experimental step; foundational gaps that impede independent work.

Calibration Framework: Benchmarking Scores

- **Outstanding (4):** The student performs at the level of a seasoned researcher. The proposal is highly innovative, and the oral defense is authoritative and insightful.
- **Very Good (3):** This is the expected baseline for a passing student. The work is solid, rigorous, well-defended, and meets all standard programmatic metrics.
- **Acceptable (2):** The student is sound but passive. The project lacks depth, or the student struggles to connect their project to the broader biomedical landscape.
- **Unacceptable (1):** Significant conceptual flaws, major design gaps, poor communication, or an inability to answer foundational questions.

Guidelines for Assigning Outcomes

- **Pass:** The student is ready for independent candidacy.
- **Conditional Pass:** Use this if the student has strong potential but displayed a **specific, isolated gap** (e.g., excellent oral defense but a poorly written Aim 3, or great writing but a weak grasp of statistics). *Committees must outline explicit, measurable remediation steps (e.g., a revised proposal rewrite or advanced coursework).*
- **Fail:** The student shows pervasive, systemic deficiencies across multiple core areas, indicating they are not yet ready to drive doctoral-level research.

Scoring Rubric

Biomedical PhD Qualifying Exam Rubric

Student Name: _____

Date: _____

Examining Committee Names: _____

☐ The evaluation committee confirms that the primary advisor maintained a strictly observational role and did not answer questions, provide hints, offer guidance, or assist the student during the examination.

Scoring Framework (Applies to All Sections)

- **4 = Outstanding:** Masterful, novel, highly rigorous, or flawless execution.
- **3 = Very Good:** Solid, clear, well-justified, and meets all primary standards.
- **2 = Acceptable:** Adequate or sound, but lacks depth, precision, or critical synthesis.
- **1 = Unacceptable:** Superficial, flawed, vague, or unprepared.

Section 1: Written Proposal

Evaluates the originality, rigors of design, and clarity of the written research project.

Evaluation Criteria	Score	Committee Comments / Specific Feedback

I. Depth & Synthesis of Background: Mastery of background literature; ability to integrate complex concepts and identify clear, novel research gaps.		
II. Hypotheses & Aims: Precision, testability, and logical flow of the hypothesis and supporting specific aims.		
III. Rigor & Research Design: Methodology is appropriate, rigorous control of variables, and anticipation of potential challenges/alternative approaches.		
IV. Depth of Interpretation & Anticipation of Challenges: Able to interpret and articulate results; able to anticipate challenges and suggest reasonable alternative approaches.		
V. Broader Implications & Future Directions: Powerfully articulates long-term scientific implications and outlines impactful future directions.		

VI. Command of Scientific Literature & Referencing: Demonstrated knowledge of the relevant scientific literature; proper use of comprehensive, cutting-edge referencing.		
VII. Clarity, Cohesion & Professionalism in Writing: Cohesive, persuasive, and concise written scientific communication free of significant errors.		

Section 2: Oral Defense

Evaluates the student's ability to articulate, defend, and critically analyze their research under questioning.

Evaluation Criteria	Score	Committee Comments / Specific Feedback
I. Delivery & Engagement: Clear, organized, and compelling presentation delivery with professional audience engagement.		
II. Understanding (Proposal & Field): Depth of conceptual understanding regarding the proposal, core field, and broader biomedical landscape.		

III. Critical Thinking & Problem Solving: Ability to evaluate complex problems independently, synthesize data, and formulate robust solutions.		
IV. Strategic Responsiveness to Complex Questions: Insightful, direct, and authoritative navigation of challenging questions and scientific ambiguity.		
V. Breadth & Interdisciplinarity of Knowledge: Demonstrates excellent foundational knowledge across relevant biomedical disciplines and can relate them to the overall research project.		
VI. Intellectual Maturity & Composition: Generally professional and composed, appears confident, articulate and intellectually mature under pressure.		

Final Assessment & Recommendations

Overall Outcome (Check One)

- **[] Pass:** Student thoroughly meets expectations, demonstrating strong critical thinking, conceptual grasp, and independent research potential.
- **[] Conditional Pass:** Student demonstrates strengths but has specific deficiencies (e.g., design flaws, knowledge gaps) requiring immediate, documented remediation.
 - *Next Steps: Committee must provide a written remediation plan, timeline, and resolution process.*
- **[] Fail:** Student consistently falls short of rigorous standards, indicating insufficient readiness for doctoral research.
 - *Next Steps: Committee determines if a retake opportunity is permitted and sets the timeline.*

Detailed Committee Feedback & Remediation Plan

(Provide comprehensive, actionable feedback highlighting strengths and targeted areas for improvement. For conditional passes, explicitly outline exact requirements, expectations, and deadlines.)

Exam Run of Show

TSGP PhD Qualifying Exam Run of Show

Roles & Responsibilities:

Student:

- Prepare and submit the thesis proposal by the required deadline.
- Deliver the oral presentation and complete the examination.
- Demonstrate knowledge of the proposed research and relevant scientific literature.
- Address any required revisions or stipulations following the exam.

Thesis Advisor:

- Mentor the student in developing the proposal and preparing for the exam.
- Assess the student's readiness for candidacy.
- Provide feedback to the Committee on the student's progress and development.
- Support the student in responding to committee recommendations.
- Thesis Advisor does not participate in the questioning, and does not answer the questions for the student

Thesis Committee Chair:

- Facilitate and oversee the examination process.
- Lead discussion, questioning, and deliberation.
- Communicate the examination outcome to the student.
- Complete and submit the Qualifying Examination Scoring Report.

Thesis Committee Members:

- Review the proposal prior to the examination.
- Participate in questioning and evaluation of the student.
- Provide constructive feedback on the research plan.
- Contribute to the final examination decision and any required recommendations.

Order of Events:

Private Student Discussion with the Committee (Advisor Absent) (~10 minutes)

The exam begins with a brief closed-door discussion between the student and the Thesis Committee, with the advisor absent. This conversation provides the student with an opportunity to reflect on their progress in the program, discuss research accomplishments and challenges, evaluate their training experiences, and share any concerns regarding their academic or professional development.

Private Advisor Discussion with the Committee (Student Absent) (~10 minutes)

After the student exits, the Thesis Advisor meets privately with the Committee to provide an

independent assessment of the student's research progress, scientific development, and readiness to advance toward candidacy. This discussion helps give the Committee additional context before the formal examination begins.

Student Presentation of the Thesis Proposal (20-30 minutes)

The student returns and then delivers an oral presentation of their thesis proposal, outlining the background and significance of the project, specific aims, preliminary findings (if applicable), research strategy, anticipated outcomes, and potential challenges. This presentation serves as the foundation for the subsequent examination and scientific discussion.

Committee Examination and Scientific Questioning (30-45 minutes)

Following the presentation, the Committee engages the student in an in-depth scientific discussion. Questions may focus on the rationale behind the proposed research, experimental design, methodology, interpretation of results, relevant literature, alternative approaches, and the broader significance of the work. The goal is to assess both the student's mastery of their project and their ability to think critically as an independent scientist.

Committee Feedback and Proposal Discussion (15 minutes)

Once questioning concludes, the Committee transitions into a constructive feedback discussion with the student. Committee members highlight strengths of the proposal, identify areas for improvement, and offer recommendations regarding experimental approaches, feasibility, rigor, and future directions. This portion is intended not only to evaluate the student but also to help strengthen the overall dissertation project.

Closed Deliberation and Evaluation (Student Absent) (15-20 minutes)

The student is excused while the Committee, together with the Thesis Advisor, reviews the written proposal, oral presentation, and performance during questioning. Based on the student's overall readiness for PhD candidacy, the Committee determines an outcome of **Pass**, **Conditional Pass (Pass with Stipulations)**, or **Fail** *see rubric*.

Communication of Outcome and Next Steps (10 minutes)

The student is invited back into the room and the Committee Chair formally communicates the examination outcome. The Chair summarizes the Committee's evaluation, reviews any recommendations or required revisions, and outlines next steps, including any stipulations that must be completed before advancing to candidacy.