Student Research and Thesis Honors Fellowship Program for Predoctoral Dental Students

Program Guidelines

August, 2012

1. Program Description. Participation in the Student Research and Honors Program provides the student with a number of benefits beyond the DDS curriculum. These benefits can include the development of critical cognitive and procedural skills, summer funding for active research participation, engagement with faculty mentors, collegial support from other students, travel funds to present the student’s research at a scientific meeting, and graduation with thesis honors.

2. Research

2.1. Eligibility. First, second, and third year predoctoral dental students may submit applications to the Student Research and Honors Committee for funding considerations for the following summer. Incoming dental students (as well as entering international students) may also apply, pending availability of funds, after firm acceptance into the pre-doctoral program.

2.2. Summer Research Program. The summer research period is full-time and defined by the corresponding academic dates. The total period for funded research is considered to be 8 weeks; this includes not only the summer period, but also the additional time during the academic year (Fall & Spring semesters) required for proposal development and meeting presentations. Allowances during the summer period can be made for required summer courses and preparation for board examinations; the student’s actual schedule will be determined in conjunction with the faculty advisor. As appropriate and approved by the mentor, the student may participate at another time during the academic year in order to complete the full 8-week program of research. Joint signatures from the student and advisor at the end of the summer period indicate the fulfillment of this responsibility, or whether further time in the academic year is required in order to complete the research participation. There are no other exceptions to this policy.
The Summer Research Training Program includes:

2.2.1. **Summer Research Seminar** series, which has traditionally been held every Tuesday morning from 9-11AM, with mandatory attendance expected of funded students.

2.2.2. **Additional training.** As needed/required, any of the following should be accomplished before the intensive summer research period:

2.2.2.1. Training in radiation safety, laboratory practices (if radioactive isotopes are used) and OSHA-related matters (laboratory mentor will instruct on specific chemical hazards);

2.2.2.2. Training in human subjects protection; and/or

2.2.2.3. Training in animal handling techniques.

2.2.3. **Mentoring.** The faculty member must be reasonably available to mentor the student during his/her research in the summer. Mentoring includes regular meetings with the student, working with the research group, or both. Mentors are encouraged to link dental student trainees with existing graduate students or post-doctoral fellows, a type of interaction that is highly encouraged by NIH. Students need guidance and feedback as they prepare their research talks for the end of the summer period; practice and critique by the faculty member (or other lab members) are desirable.

2.2.4. **Full-time commitment.** Good research takes time, and it is expected that students will fulfill the “full-time” intention of the summer commitment, which is part of the funding agreement that student and mentor will both endorse. However, students, especially rising juniors and seniors, have a number of competing commitments during the summer period, such as studying for Part I of the National Boards or brief residency-site experiences related to the residency application process. It is in the School’s interest that students are well prepared and do well on their Boards, and so this activity is one that students are allowed to blend into their research scheduling. The student must inform their mentor of these other commitments in advance. Other obligations that students might want to pursue (e.g., clinical rotation) that are not formal educational requirements are not an acceptable part of the summer research period.

2.2.5. **Manage logistics.** We recognize that mentors and students may need to be flexible regarding the logistics of how the student accomplishes the research objectives, and that this will depend on the type of research as well. The Committee recommends that mentors and students discuss how the research goals can be met, simultaneous with meeting other essential commitments in the student’s academic program, while also recognizing that other activities may not be possible. Mentors should help students assess and arrange their priorities so that the student is able to participate
fully, in order to make the experience meaningful. Full participation can vary from student to student depending on the nature of the research and is not always easily defined as number of hours per week.

2.2.6. **Evaluation.** Mentors will be required to sign a statement at the end of the summer endorsing the student’s full-time engagement in the summer research project. Mentors will also be asked to provide a written evaluation of the student at the end of the summer. The Committee also recommends that mentors share and discuss this evaluation with their students. This information will be used as part of the overall program evaluation performed by the Research and Honors Committee. This information may also be used in the evaluation of subsequent proposals that the student may later submit while a student at SDM.

2.3. **Formal presentations** of the student’s project and results include:

2.3.1. **Summer Research Day.** This full-day event is held just prior to fall orientation. Funded students are required to present. Please adjust any summer vacation accordingly. All faculty are encouraged to attend.

2.3.2. **School of Dental Medicine Annual Student Research Day.** The Spring Student Research Day (late February or early March) is organized by the Associate Dean for Research and is open to poster presentations from any pre-doctoral and post-doctoral clinical students, as well as from graduate and post-doctoral students of the School of Dental Medicine. Participation is required for all funded Summer Research Program students. Abstracts will be required of all presenters. If an abstract was previously submitted for another meeting, it may be used for this meeting. Abstracts should contain names of all authors (including mentors) as well as an acknowledgment of funding; the required format for the abstract is that used by the International Association for Dental Research. Mentors should assess the level of the work of their student in order for the student to present well at the meeting.

2.3.3. **Presentation at scientific meetings.** Presentation at a national meeting of an organization relevant to the student’s research area is strongly encouraged. Preliminary results are acceptable basis for such presentations. A travel stipend is typically provided by SDM for a student to attend one such meeting during the academic year following the student’s participation in the Summer Research Program. Mentors should assess the level of the work of their student in order for the student to present well at the meeting.

2.3.4. **Submission of an abstract or paper for publication.** In addition, students also are strongly encouraged to publish research results as an AADR/IADR abstract (or submitted to another appropriate national...
meeting), as well as to attempt publication in a peer-reviewed journal. All publications should acknowledge the source(s) of funding (private and NIH funding). Funding for subsequent applications to the Summer Research Program is contingent upon satisfactory progress each year; abstracts represent one form of progress.

3. Thesis Honors

3.1. Eligibility. The development of a Thesis represents the culmination of a student’s research activity, and it provides an opportunity for the student to integrate the research experiences. A Thesis is restricted to students who have engaged in independent original empirical research. The Thesis Honors opportunity is not restricted to students who have participated in the Summer Research Program. Students who have committed at least the equivalent of two summer periods to research may have enough scientific material and have acquired enough knowledge about their research area to be ready to develop a thesis.


3.3. Committee and Defense. Generally, the Thesis Committee is comprised of a Committee Chair, two faculty members, and an outside reader. One of the faculty members must be the Chair or Co-Chair of the Student Research and Honors Committee (or designee). The outside reader is typically another faculty member within SDM, but the reader may come from outside this School. The composition and members of the Committee are subject to approval by the Chair of the Research and Honors Committee. A Thesis Honors Application Form must be completed by the student and submitted to the Chair of the Research and Honors Committee. After the thesis is developed, it is submitted to the Thesis Committee members (including the representative from the Research and Honors Committee), and a date is set for the Defense of the Thesis. After successful defense of the Thesis and any required final revisions, the final printer-ready thesis will be submitted to the Chair of the Research and Honors Committee in Word format; the thesis will be printed, soft-bound, cataloged, and archived by the Health Sciences Library.

4. Oversight

4.1. Student Research and Honors Committee. The Student Research and Honors Committee is comprised of 9-10 members and 2 Co-Chairs; the Chair is elected by the Voting Faculty of the School of Dental Medicine, and the Chair selects a co-Chair. This Committee establishes the guidelines for the student research program, reviews proposals for funding, acts as judges at the Spring Student Research Day, and contributes to the seminar series during the summer program.
4.2. **Advisory committee.** An advisory committee is comprised of the two Co-Chairs, the President and Vice-President of the Dental Student Research Group, and the Associate Dean for Research, and it meets on an ad hoc basis. Research students are encouraged to meet with the Committee Co-Chairs or officers of the DSRG as needed in order to facilitate their involvement in the research program.

5. **Funding**

5.1. **Sources.** Funding for the Student Research Program comes from several sources: Dean’s Office and private donor funds. Previously, NIH-based training grants awarded to individual faculty members had funded additional students. In addition to these sources, students may also seek other sources of funding; generally, such actions by a student are based on recommendations by the Committee to the student and mentor and are based on excellence of a proposal.

5.2. **Fellowship vs. loan.** The SDM Fellowship award is considered a fellowship only if all of the above conditions are satisfied. Otherwise, the funding is considered a loan, which requires payback. Compliance with the above conditions will result in a waiver of any payback requirements, subject to approval of the Dean, in consultation with the Student Research and Honors Chair.

5.3. **Written acknowledgement.** Students will provide to the private funding sources written acknowledgement of funding received as specified by the Development Office in the School of Dental Medicine.

5.4. **Request for external funding.** Students who have presented an abstract at a national meeting and who have an exceptional proposal are encouraged to apply for an AADR research fellowship for the following summer. These applications are due in January, prior to the March meeting of the AADR. The actual award for students who submit a successful application for external funding in addition to approved SDM funding will be subject to development of a suitable overall training plan reflective of the student’s demonstrated ability to conduct research.

6. **Preparation of Research Fellowship Application**

6.1. **Submission Cycles.** Each academic year will have one submission cycle. This cycle occurs in the Fall semester and is open to all predoctoral students (first, second, and third year students as well as entering international students and students entering the following Fall as pre-doctoral students). The letter of intent is mandatory and is due the last week of November. While submission of a letter of intent is not binding (a student may withdraw from the student research program after submission of a letter of intent), no final proposals will be accepted without a letter of intent. The deadline for submission of the full
proposal is the second week of January. Proposals will be reviewed in February after which students and mentors will be notified by email if the proposal has been approved. Proposals that were not approved may be revised and resubmitted for review in March. Note that the second review cycle depends on fund availability remaining after those proposals approved in the first review are considered for funding; there is no guarantee that a revised proposal will be funded even if approved. The precise dates for deadlines will be announced at the beginning of each cycle year.

6.2. Selection of Mentor and Research Topic. Students should identify prospective faculty by reviewing the Faculty Research Descriptions on the Student Research Website: http://student.sdm.buffalo.edu/research/. This list is updated each September and reflects those faculty who are available for student mentoring during the respective Fall-Spring-Summer academic period. Students are also encouraged to obtain information regarding the laboratory or clinical training environment, previous history of student support, publication history, and likelihood of the student application receiving funding. Students can discuss possible choices with the Committee co-Chairs before contacting a prospective mentor. Students should meet with the prospective mentor regarding the student’s research goals and fellowship proposal. The quality of developed proposals generally reflects the quality of the working relationship between student and mentor. It is worth noting that the student should select a mentor with relevant interests and with whom the student can work collaboratively.

6.3. Returning students may elect to work with a new mentor. Because the overall research program during the 4-year pre-doctoral program is relatively short, students are encouraged to work with the same mentor in order to obtain depth of experience and in order to maximize likelihood of sufficient material for a thesis. However, interests may change and students may find another mentor more suitable for their ongoing research interests.

6.4. Co-Mentors. Special circumstances may indicate appropriateness of a student having 2 mentors for a given summer, where one mentor is designated as primary for administrative purposes. Approval for this arrangement is granted by the Committee Chair.

6.5. Additional resources. Students may require the assistance of other individuals such as for statistical analyses or laboratory analyses that can only be performed in another laboratory. Such arrangements require a letter of support from each external resource to be appended to the application; the letter needs to indicate what service will be provided.

6.6. Letter of intent. The letter of intent serves to encourage and facilitate an early matching of interested students with mentors. A PDF-form with editable text fields can be downloaded from the Student Research Group’s website (https://dental.buffalo.edu/Research/DSRG.aspx). The form must be completed by the deadline indicated, usually the third week in November. It will only be accepted if it carries the signatures of both student and mentor, thereby confirming that (i) student and mentor have decided on a project and
(ii) that the mentor is willing to guide the student during proposal preparation and summer research activities. The letter of intent is a non-binding commitment in that the student can later decide to not submit a proposal. However, no applications for research will be accepted for review unless a letter of intent has been submitted. Proposed changes in mentor after the due date for the letter of intent must be reviewed by either of the Committee Co-Chairs. Changes in title may be made without contacting the committee. Please note that no mentor will be allowed to supervise more than 2 funded students per year.

6.7. Letter(s) of support. A letter of support is required from the mentor stating that he/she will be responsible for overseeing the student’s research project. The application may also include letters from individuals other than the mentor who will be responsible for overseeing or contributing to some aspect of the project. In this case, a letter of support should include a description of the specific component that the individual will contribute to the student research experience.

6.8. Application Format. The proposals will follow the general format of the Public Health Service Grant Application Form PHS 398, which can be consulted for more information at (http://grants.nih.gov/grants/funding/phs398/phs398.html). Each submission must be typed with sections A-D double spaced and sections E-J single spaced. Page limits for the proposal proper (i.e. sections A-D) may not exceed 8 pages; proposals that exceed this limit or do not follow this style will not be considered.

Each proposal must include the following sections, as appropriate to the type of proposed study:

A. Specific Aims. List objectives, describe what the research is intended to accomplish, and clearly state the hypothesis to be tested.

B. Background and Significance.

C. Preliminary Studies / Progress Report. The student’s prior experience, if any, with the specific research topic should be reflected here. This can also include a summary of any prior meeting presentations, as a reflection of progress. (This section is required if the student was funded during the prior summer).

D. Materials and Methods. (include statistical design, as appropriate).

E. Literature Cited.

F. Resource Information.

Part 1: List the facilities and equipment to be used for research project and if resources outside the mentor’s control are needed, designate the sharing arrangement.

Part 2: Describe the student’s role on the project in sufficient detail that the reviewer will clearly understand the specific responsibilities of the
student on the project. For many projects, this will be sufficiently clear in the methods; however, for projects that use existing datasets, use shared equipment or resources across laboratories, or are collaborative with existing studies, it is critical that the specific responsibilities of the student be specified.

G. **Other financial support for applicant and sponsor.** A brief description of arrangements for financial support (other than the requested summer fellowship) needed to complete the project should be provided.

H. **Human Subjects.** If applicable, the application must include a description of human subjects protection procedures and documentation that the project has been approved by the Human Subjects Review Committee, or that arrangements will be made for approval prior to the start of the project.

I. **Vertebrate Animals.** If the study involves vertebrate animals, the application must include documentation that the project has been approved by the Laboratory Animal Care Committee, or that arrangements will be made for approval prior to the start of the project.

J. **Recombinant DNA, Recombinant DNA Molecules.** If the study involves recombinant DNA, the application must include documentation that your project adheres to the current NIH *Guidelines for Research Involving Recombinant DNA Molecules*.

**6.9. Proposal Writing.**

**6.9.1. Student as primary author.** The research proposal should be a product of the student’s efforts. The mentor is expected to help the student write the proposal, but not actually take the initiative to write it. Operationally, the Committee’s expectation is for the student to initiate writing and idea generation, which is followed by iterations of revision with the mentor based on what the student has accomplished at that stage. Rewriting sentences with the student in order to create a proposal that is clear, well written, and understandable by reviewers who range from content specialists to non-specialists, is a sensible goal. It is recommended that proposals be written to the highest level possible, according to the level of effort provided by the student. The amount and type of mentor support is expected to vary by level of student experience (i.e., a 1st-year student would need more help than a student who already has prior experience in the mentor’s research program). Mentor endorsement of the proposal indicates that the mentor has read and approved the application as an appropriate product.

**6.9.2. Originality of the student’s work.** Student research proposals, especially at the initial stages, are often extensions of the mentor’s
research program; consequently, many publications or grant proposals (completed or in process) may exist that describe the general nature of the planned research, the methods to be used, or both. A laboratory manual may exist which describes the planned methods in great detail. In the writing of a proposal, the student may find that any or all of these sources are important resources for the student’s proposal. Any text taken from another source must be appropriately cited; methods taken verbatim from a laboratory manual must be clearly referenced as “from the laboratory manual”. Background material extracted from another publication or proposal must be appropriately identified as from that source, and core ideas as found in another source and not original to the student must be appropriately cited. In general, direct copying of material from another source for use in a student proposal is not acceptable and is in violation of the UB’s Academic Integrity Policy. Further information regarding the Policy can be found at academicintegrity.buffalo.edu/policies/index.php. This resource should be consulted if there is any doubt regarding acceptable procedures in writing proposals from the perspective of academic integrity; this resource, in addition, provides examples of plagiarism and explains why such examples are considered as plagiarism, and it also discusses the problems with paraphrasing another’s work and not providing the appropriate citation. In practical terms, that means that any material from any source used in order to describe aims, background, and rationale for a study must be appropriately cited. One exception to that policy involves the copying of existing methods for a particular procedure, as contained in the mentor’s laboratory manual, into the Methods section of the student’s proposal; this is an efficient, appropriate, and generally acceptable practice for the sake of using already-worked-out methods. An entire Methods section that was copied from a laboratory manual would not be considered acceptable, as that would imply that the study was too much like some prior study and hence not sufficiently original. Note, however, that direct copying of methods from a publication (mentor’s or otherwise) is not acceptable as it probably violates copyright; this latter issue is an on-going question in scientific ethics and avoiding possible problems in copyright violation is the best option at this time.

6.9.3. Sample Proposals. Sample proposals are available in order to provide applicants with an example of a successful proposal:

6.9.3.1. Chromatin Immunoprecipitation of InsP3 Receptor Gene Promoter Binding Proteins in G-292 Human Osteosarcoma Cells

6.9.3.2. Proteomic Analysis Of Muc7 12-Mer Induced Protein Expression Changes In Streptococcus mutans

6.9.3.3. Electromyographic Correlates of Common Oral Behaviors: Study Extension. [This proposal is an example of clinical
research requiring human subjects approval, and the proposal also demonstrates how a continuation project from the prior summer is described.

6.10. Submitting the Application. The proposal must be uploaded by the mentor to the UBLearns website no later than the due date as stated on the Program Events Calendar. Submission of the proposal must follow the Guidelines as stated on the web site and detailed below. Mentors should monitor the proposal packet for completion before it is submitted. Proposals that do not adhere to the Guidelines will be returned to the student and will not be reviewed.

6.11. Application package. The application package consists of the following documents that are to be submitted in the order listed below and must be submitted as a single pdf file. Any applications that are not submitted with this format and as a single file will be returned without review.

6.11.1. Letter of intent which was previously submitted by the student on the most current form at the SRH website.

6.11.1.2. Letter of support from the mentor that states the mentor’s willingness to supervise the proposed research project. This letter may also include an overview of the project or a general description if there are specific circumstances regarding the research proposal that warrant communication to the reviewers. Any other required letters of support must also be included (see 6.7).

6.11.1.3. Student’s current Curriculum Vitae

6.11.1.4. The proposal (as defined under 6.6)

6.12. Conditions of Participation. If a proposal is approved for funding, the student and mentor will co-sign a statement (Conditions of Participation, provided by the Dean’s Office) which allows the student and mentor the opportunity to organize their respective schedules for the summer. This signed document is submitted during the Summer session at the request of the Dean’s Office and returned to the Associate Dean for Research.

7. Proposal Review. Proposals will be reviewed, evaluated and rank ordered for scientific merit by the Student Research and Honors Committee. Applicants having prior funded summer research should provide evidence of progress since the last funding period. Proposals that are not well defined may be returned for revision and resubmission if the proposal demonstrates sufficient promise within the first submission. Exceptional proposals will be identified to the student and mentor with recommendation that they be submitted for an AADR Fellowship.

7.1. Review Criteria. The following criteria are used by the Committee for review:

7.1.1. Are hypotheses or objectives stated concisely?
7.1.2. Do experiments or study design test the hypotheses appropriately?

7.1.3. Is the proposal clearly written and understandable?

7.1.4. What is the scientific merit?

7.1.5. What is the likelihood of achieving the stated goal by the end of the research period?

7.1.6. Is the project appropriate to the student’s research skills?

7.1.7. Is the planned research environment (mentor, lab, subject population, etc) adequate for the research as designed?

7.1.8. Is the proposed research sufficiently independent from overlap with other ongoing projects in that research environment?

7.2. **Philosophy of the Research and Honors Committee.** Proposals are to be written by the student, under the general guidance of the individual mentor. Typically, the student discusses the proposed research with the faculty mentor, who may recommend or provide suitable papers, references, or related background materials. While the student writes the proposal under the mentor’s guidance, the Committee expects well-written proposals. Consequently, students may need help with aspects of proposal development and writing. A well-written proposal is a concrete indicator of a suitable working relationship between student and mentor.

7.3. **Summary review.** The Committee Chair will send to the student applicant, with copy to the mentor, a summary statement of the Committee review. This statement will also include the funding recommendation, which is submitted to the Associate Dean for Research and who makes the final determination regarding which proposals are funded. Factors used for funding determination include:

7.3.1. Preference for support will be given when the faculty has a demonstrable track record of successful student research mentoring and/or where the faculty are new to such activities and who wish to become active in this area.

7.3.2. Proposals involving mentors and/or students with repeated difficulty in complying with the conditions of the Program, or with recent history of unfulfilled commitments regarding research support, will be less favorably considered.

7.4. **Funding action.** Ranking and funding of approved proposals will be followed by administrative action by the Dean’s Office regarding signed agreement of Conditions of Participation as well as financial forms; these actions take place in April. Approval of a proposal should be followed by the student’s contacting the mentor in order to determine if there are any interim steps to be taken for beginning the research project.

8. **Resubmission of Revised applications.** If a proposal is not recommended for funding by the Research and Honors Committee Review process, the student will
have the opportunity to revise the proposal and resubmit an amended proposal for re-review in March after the initial review cycle.

8.1. **Components of the revised application.** The revised application must contain a cover letter summarizing the changes made to the application in response to the review committee. This cover letter must be included as a part of the single pdf file. All changes to the application body should be indicated by changes in either font or text color, so that it is clear how and where the application has been revised. All other components of the application package listed in 6.10 above must be submitted.

9. **Other Educational Opportunities**

9.1. **Pre-DDS students**

   9.1.1. Course credit can be created for dental students if they continue to engage in research during the academic semester; this will document their efforts on their transcript. If this is applicable, the student should contact the Office of Academic Affairs for assistance. Grading of S/U is recommended.

   9.1.2. The Minors in Oral Biology is another option, which includes the student taking one additional course (1-2 credit hours) during the senior year, participating in the Oral Biology journal club for one semester, and writing a thesis.

9.2. **Baccalaureate students**

   9.2.1. Mentors are encouraged to ask students to write proposals, as appropriate to the research experience and student ability. However, such proposals are not eligible for funding of undergraduate students by the School of Dental Medicine unless the student has been accepted as a student into the School. Individual mentors may have funding for undergraduate students, which is separate from formal funding from the School.

   9.2.2. Undergraduate students are welcome to participate in the summer research seminar program and to present on research day at the end of the summer period. Such involvement by undergraduate students is encouraged by the Committee.

   9.2.3. Undergraduate students are invited to present a poster in the school’s Annual Student Research Day, held February or March of each year.

   9.2.4. Course credit may be available to undergraduate students participating in research. The mentor should contact the Office of Academic Affairs regarding the types of credit available, if desired by the student.