

2015-2016

DMD Student Research Guidebook

OFFICE OF RESEARCH OVERVIEW & CONTACTS

Research activities at the Harvard School of Dental Medicine aim to set the international standard and pace for basic discoveries, clinical application, and research training in an area that lies at the heart of dental medicine. By leveraging its scientific strengths and focusing on the area of skeletal development, growth and homeostasis, as well as clinical and health policy research, Harvard School of Dental Medicine has established a strategic direction for its research programs. Exciting opportunities, both scientific and organizational, are on the horizon for clinical and translational research in areas where we already have basic science strength. As the only School within Harvard University with its own clinical facility, Harvard School of Dental Medicine continues to differentiate itself through a unique emphasis on basic and clinical research combined with exemplary patient care and education. Below are several people you will get to know in the HSDM Office of Research. Please do not hesitate to contact any of us with questions or concerns regarding your project and/or research requirements at HSDM. Our offices are located on the fourth floor of the REB.

BJORN R. OLSEN, Dean and Professor (bjorn_olsen@hms.harvard.edu, 617-432-1874)

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OVERVIEW OF DMD RESEARCH REQUIREMENTS

All DMD students at HSDM must complete a scholarly project and present at HSDM Student Research Day as part of their graduation requirement and to receive credit for the course, SDM109 (Scholarship in Dental Medicine). Students in the classes of 2016-2018 must complete these requirements by the end of their second year. The class of 2019 will have a different timeline to be announced later. Their research will most likely occur in years 3 and 4.

ALL 2016-2018 STUDENTS MUST COMPLETE THE FOLLOWING:

1. Coursework
2. Selection of a research mentor
3. Written research proposal (3-5 pages)
4. Application to Scholars in Medicine Office (SMO) at HMS
5. Completion of 8-week research project
6. Written research report (10 page maximum)
7. Presentation at Soma Weiss Day
8. Poster presentation at HSDM Student Research Day (see page 7)

In 2012, HSDM introduced the Special Field Track in Research, in which students can be considered for honors standing. Please see page 11 for detailed information on the Research Track requirements and procedures.

DMD RESEARCH DEADLINES FOR CLASSES 2016-2019

DMD CLASS OF 2016

STUDENT RESEARCH DAY

Students who have not presented at Research Day in a previous year must present a poster at Student Research Day 2016 in order to graduate. Poster presenters' Research Day abstracts must be submitted to the Office of Research **by March 18, 2016**. All students must attend Student Research Day on **April 5, 2016**.

HONORS IN RESEARCH

Students must formally apply to be considered for Special Track in Research, in which students can be considered for honors standing. The latest that students in the class of 2016 can apply is December 1, 2015; early applications are encouraged. Please see page 11 for further information on the Research Track.

DMD CLASS OF 2017

STUDENT RESEARCH DAY

All students must attend Student Research Day on **April 5, 2016**.

DMD CLASS OF 2018

SOMA WEISS DAY

All students who received funding from the Scholars in Medicine Office must present a poster at Soma Weiss Day. This is scheduled through the SMO Office, **NOT** the HSDM Office of Research, and will take place in **January 2016**.

STUDENT RESEARCH DAY

All students must attend Student Research Day on **April 5, 2016**.

RESEARCH REPORT

All students must submit a 10-page (maximum) research report by **June 1, 2016**. See page 7 for more information.

DMD CLASS OF 2019

The class of 2019 will have a different timeline to be announced later. Their research will most likely occur in years 3 and 4.

PERFORMING A RESEARCH PROJECT

TYPES OF RESEARCH

BASIC RESEARCH, or bench research, aims to improve human health with scientific discoveries. Such discoveries typically begin at “the bench” with basic research — in which scientists study disease at a molecular or cellular level. This may include the use of animal models such as mice, chicks, and zebrafish. Basic scientists provide clinicians with new tools for use in patients and for assessment of their impact.

CLINICAL/TRANSLATIONAL RESEARCH aims to improve human health by translating scientific discoveries into practical applications that progress to the clinical level, or the patient's “bedside.” Scientists are increasingly aware that this bench-to-bedside approach to translational research is really a two-way street. Clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations.

GLOBAL AND COMMUNITY HEALTH RESEARCH involves the development, promotion, and sustainment of initiatives in oral public health domestically and around the globe. Global and community health researchers work with local and international institutions and organizations to improve oral health care awareness and accessibility.

RESEARCH AREAS AT HSDM

Although you are not limited to specific research areas, below is a list of the major research areas/topics being investigated at HSDM.

BIOMEDICAL AND TISSUE ENGINEERING: projects with a focus on biomaterials, fracture healing, bone regeneration, wound repair, and tooth regeneration.

CELL BIOLOGY: projects with a focus on skeletal and vascular biology and pathology, cell differentiation, embryonic development, tissue homeostasis, and signal transduction.

CLINICAL SCIENCES: projects with a focus on cutting-edge technologies that address questions with human translational impact.

DEVELOPMENTAL BIOLOGY AND PATHOLOGY: projects with a focus on molecular basis for skeletal and vascular morphogenesis, genetics of birth defects, and vascular anomalies.

EDUCATION SCIENCE: projects with a focus on problem-based-learning, the use of information technology in education, and innovative methodologies in dental education.

EXTRACELLULAR MATRIX BIOLOGY AND PATHOLOGY: projects with a focus on wound healing, matrix remodeling and degradation, and matrix changes during ageing.

GENETICS: projects with a focus on genomic and proteomic technologies, genetic causes of degenerative joint disease, and skeletal dysplasias.

IMMUNOLOGY: projects with a focus on oral mucosal and salivary gland diseases, oral manifestations of systemic diseases, infectious agents, and inflammatory bone loss.

PUBLIC HEALTH AND HEALTH SERVICES: projects with a focus on health promotion, access to care, disease prevention, pharmacological and behavioral interventions, epidemiology of dental diseases, and health care policy.

SKELETAL BIOLOGY AND PATHOLOGY: projects with a focus on skeletogenesis, skeletal morphogenesis and growth, tooth formation, joint disorders, and bone loss.

RESEARCH MENTORS

The importance of mentor and project selection should not be overlooked; they are crucial to the quality of your experience and the successful completion of your requirements. Thus, you should expect to devote a considerable amount of time to this step, critically assessing the research environment offered by the mentor.

Clearly, you should find the proposed project interesting and important. Beyond that, it is essential that the specific aims of the project be clearly delineated and feasible within the available timeframe. The mentor should have the resources to enable you to achieve the specific aims.

If your project involves human subjects, you should ask whether the mentor has obtained the necessary IRB approval. If the mentor has not obtained approval, you should plan for additional time so that the mentor can obtain such approval. Remember that no research involving human subjects can be started before the project has received IRB approval.

Ideally, a mentor will have demonstrated productivity by a record of publication and a record of private or public funding in a given area. A mentor does not have to be in the field of dentistry. Students have chosen research mentors at HSDM and the Forsyth Institute as well as throughout the Longwood Medical Area and beyond. The most comprehensive database for Faculty mentors is located on the Harvard Catalyst website:

<http://connects.catalyst.harvard.edu/Profiles/SearchProfiles.aspx>.

If you choose to do a research project in another country, you will need to find a Harvard-based mentor willing to serve as a second supervisor.

IRB/IACUC APPROVAL PROCESS

HSDM students are subject to the same policies, guidelines and regulations as the Faculty of Medicine. It is therefore necessary for student research projects to be reviewed by the Office of Research Subject Protection. The Committee on Human Studies has an Internal Review Board and reviews all human subject-related research projects. The Standing Committee on Animals has an Institutional Animal Care and Use Committee and reviews all animal subject-related research projects. It is important to note HSDM's policy that students should not submit their own application, but instead, work with their Research Mentor under his/her application.

IRB INFORMATION FOR MEDICAL AND DENTAL STUDENTS

Information on HMS/HSDM IRB and IACUC training, requirements, and approvals, and all relevant documents, can be found on the website of the HMS Office for Research Subject protection, <http://www.hms.harvard.edu/orsp/index.html>.

Students are required to obtain all appropriate HMS/HSDM institutional and site approvals (domestic or international) before commencing research activities. Please contact the HMS Office for Research Subjects Protection if you plan to work with animals or humans. Starting the application process with the IRB early is recommended, as this process can be lengthy. If you have a question about whether your research even needs an IRB review, contact them. They can be reached at orsp@hms.harvard.edu; 617-432-3071; 180 Longwood Avenue, Boston MA - through the archway, through the parking lot, to the door directly in front of you.

RESEARCH RESOURCES

CORE RESEARCH FACILITIES

There are numerous core research facilities available in the Longwood Medical Area. These cores are listed on the HSDM Office of Research website at <http://www.hsdm.harvard.edu/depts/research/Hmsareacores.html>. Please contact Jim McBride, Director of Core Labs at HSDM, if you are interested in learning more about our facilities or have questions regarding facilities, equipment, or training. It is important to note that you must be trained to use equipment and access laboratories at HSDM.

SUBMITTING A GRANT APPLICATION

If you do plan on submitting a grant application, please work with the Office of Administration and Finance. They must be notified prior to the submission deadline. All grant applications must be approved through the Office of Administration and Finance as well as your Research Mentor prior to submission. This pertains to all funding (including but not limited to government awards, foundation awards, dental society awards) even if they do not require institutional approval. If you have any questions about this policy, please speak with Andrea Morris (andrea_morris@hsdm.harvard.edu).

FUNDING FOR RESEARCH TRAVEL AND POSTER PRINTING

If you present a research poster at a national or international conference, then you are eligible to apply for a \$500 travel stipend and poster printing through the Office of Research. Please note, students may receive one travel award per academic year. Please complete an Application for Research Travel Funds (page 17) to apply.

If you need to present a poster at a research event and your Mentor/PI does not have resources to pay for your poster printing, the HSDM Office of Research will reimburse you for the printing of your poster. We recommend using phdposters.com for printing. Please follow the guidelines on their site. You will be able to pick up your poster at 375 Longwood Ave. (If you submit your poster using your @hsdm.harvard.edu email, or any harvard.edu account, you should not be charged tax. We are unable to reimburse any shipping fees or rush charges.) Please complete an Application for Research Travel Funds (page 17) to request reimbursement.

HSDM RESEARCH REPORT

All students are required to write and submit a 10-page maximum, single-spaced research report describing their summer research experience, or a scientific manuscript, by the end of their second year.

The research report can be written in the first person, and does NOT need to be in the same official format as a written thesis. Please consider the following guidelines when writing your essay:

- Why was the study done?
- How was the study done?
- What were the results?
- What do the study results mean?
- What did you learn from the project?

Students who have written or contributed to a scientific paper/manuscript published (or submitted to) a peer-reviewed scientific journal can submit it instead of the research report described above. If you plan to use the journal article or manuscript as your research paper, you will need to include a cover sheet with:

- a summary of the paper (2 paragraphs or so) and
- a detailed description of your role in the actual project, as well as your contribution to the written manuscript.

This cover sheet should be signed by your PI and attached to a copy of the manuscript and submitted (electronically or as a hard copy) to the Office of Research. If you submit the manuscript electronically, you should also submit the original PI-signed cover sheet to the Office of Research.

STUDENT RESEARCH DAY

Implemented in 1998, Student Research Day at Harvard School of Dental Medicine is an annual event held each April. For the past 15 years, this program has grown exponentially. The primary focus of this all-day event is for DMD, MMSc, and DMSc students to showcase their research to faculty as well as fellow students at Harvard School of Dental Medicine, The Forsyth Institute and Harvard Medical School. Attendance at Research Day is mandatory for DMD students.

These graduating students present a research poster to faculty who in turn, evaluate their work. Faculty reviewers look at six criteria when evaluating posters:

- 1) Student's ability to describe the work and its significance;
- 2) Organization and clarity of the poster presentation;
- 3) Introduction and formulation of hypothesis and scientific method;
- 4) Quality and extent of work done by the student;

- 5) Student's overall understanding of the project; and
- 6) Overall evaluation of the poster and presentation.

Student Research Day Guidelines: Posters

All DMD students must present a poster at Student Research Day prior to graduation. For Research Day 2016, we will be using electronic posterboards. **You will not need a printed poster**; instead, you will be able to plug a flash drive into your e-posterboard to display PowerPoint, Keynote, PDF, or media files. Please see <http://eposterboards.com/formatting-options/> for information on poster file formatting.

POSTER LAYOUT

Keep in mind that the poster is a guide for your verbal "talking-points," therefore the best use of space is usually for an abstract, minimal bulleted highlights of your project (e.g.: Specific Aims, Significance, Innovation, Approach, Results, Conclusions, References) and multiple graphics. It is a good idea to include the abstract at the beginning. Please be sure to include references, and keep in mind that small fonts are not viewer friendly while graphics are viewer friendly.

If you want to include the HSDM shield on your poster, please be sure to use the correct one (updated in 2012).



WRONG: white background



RIGHT: red background

Student Research Day Guidelines: Abstracts

All students presenting a poster at the 2016 Research Day must submit an abstract (400 words maximum) of their research to the Office of Research for inclusion in an abstract book. Please email your abstract in the format specified in this Guidebook to Leanne Jacobellis by **March 18, 2016** at the latest.

Your abstract should include brief sections that clearly and concisely describe:

1. Significance and background of the study
2. Innovation
3. Approach (experimental design, expected outcomes and interpretation)
4. Results
5. Conclusions

Student Research Day Abstract Book Format

ABSTRACTS THAT DO NOT FOLLOW THIS FORMAT WILL NOT BE ACCEPTED AND MUST BE CORRECTED BY THE STUDENT. Please see the sample abstract on the following page for an example of correct formatting. (DMD students will find this formatting familiar; it is almost identical to the format requested by the SMO for Soma Weiss abstracts.)

1. Margins must be 2 inches on all four sides.
2. Justify abstract text paragraphs (block style).
3. Use Times New Roman 9 only. Do not use all caps.
4. The abstract title must not exceed two lines and must be a maximum of fifteen words. Double space after the abstract title. Bold and center all this information.

Type your name, then single space.

Type “Harvard School of Dental Medicine, DMD class of [your year of anticipated graduation]” on one line, then double space.

Type the name and degrees (eg DMD, PhD – no periods) of your research sponsor on one line, then single space. On the next lines, type their department, hospital and/or school. The sponsor's name and information cannot take up more than three single spaced lines. Only the principal sponsor can be listed.

4. Bold and center the abstract title, your name, school, anticipated year of graduation, and your sponsor’s information. Do not bold the abstract text.
5. Double space between the sponsor information and the beginning of the abstract text.
6. Indent five spaces (the tab key default works well) at the beginning of each paragraph of text. Do not double space between paragraphs. Abstracts cannot exceed 400 words.
7. Footnotes, references, and tables are not permitted.
8. Your abstract will not be edited. You are responsible for correcting typographical errors prior to submission. Abstracts will be published and are widely circulated to faculty, students, donors and administrative offices.
9. Abstracts must be submitted electronically as an attachment in Word. Please do not submit PDF files as we cannot use this format when preparing the online abstract book.

Total Occlusal Convergence on the Different Locations and Types of Full-Coverage Crowns Prepared by Dental Students

Stephan Suksong Yoon
Harvard School of Dental Medicine, DMD class of 2013

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Restorative Dentistry and Biomaterials Sciences
Harvard School of Dental Medicine

Total Occlusal Convergence, the angle formed by the two opposing axial walls of a crown-prepared tooth, is an important factor that determines the retention and resistance of a crown. Despite the ideal TOC range widely accepted by many dental schools and practicing dentists, studies have demonstrated that operators are nonetheless often overtapering their crown preparations.

The purpose of this study was to compare discrepancy between TOC of dental students' crown prepared teeth and ideal range, within three different regions in a mouth and within four different planes of the teeth.

A class of dental students at HSDM was asked to prepare three different typodont teeth for crowns: #9, #19, and #21 during third year preclinical summative examination and fourth year mock NERB. Fifty-five sets of three teeth, 18 from third year and 37 from fourth year, were collected. Using custom-fit die-bases to reproduce the same position each time, we instituted the novel procedure of measuring each tooth in four different planes: 1) facial-lingual 2) mesial-distal 3) mesiofacial-distolingual 4) mesiolingual-distofacial. Images were captured with a DSLR camera with a macro lens (105mm), and a computer screen protractor was used to measure the TOC of each image. We used the gingival 2mm of axial wall to determine the taper of each wall. Mann-Whitney U test was used to compare 3rd and 4th year dental students ($\alpha = .05$) and 1-way ANOVA test was used to compare TOCs of different teeth ($\alpha = .05$).

TOC values of all planes evaluated were greater than the recommended ideal TOC range of 4-10 degrees with the exception of M-D plane of tooth #9. TOC comparison between third and fourth year dental students did not show significant differences in all twelve planes evaluated.

In M-D reduction, there were significant differences among all three teeth (#9, #19, and #21). In F-L reduction, there was a significant difference only between teeth #9 and #21. In MF-DL reduction, there was a significant difference only between teeth #9 and #19 and between teeth #19 and #21. In ML-DF reduction, there was a significant difference only between teeth #9 and #19 and significant difference between teeth #19 and #21.

The TOC values of preparation were mainly influenced by the visibility and natural anatomy of the tooth. Dental school curriculum needs to place more emphasis on importance of dental anatomy, indirect vision technique, and evidence-based instruction on TOC with regards to preparation location and type.

SPECIAL FIELD TRACK IN RESEARCH/HONORS IN RESEARCH

The Special Field Track in provides you with the opportunity to partake in curricular and extracurricular activities in research, as well as to prepare a thesis describing your original research and contribution to the field. Ultimately, the goal of this track is to provide you with the tools necessary to become leaders in research.

Step 1: Application Process

The first step in participating in the Research Track is completion of the Application for Eligibility (see page 14), which is due on or before December 31 of your fourth year. **Please note, earlier submission is advised in order to allow time for all required program activities.** Submission of the application does not guarantee acceptance. The following components must be outlined on your application:

- 1) A personal narrative/proposal: You are required to submit a personal narrative describing your completed or planned work. This narrative should include your project description, explanations of your project timeline, project site, project/site mentor, and project activities. Finally, you should include the unique contributions your project will make to the field.
- 2) Application submission: Candidates who wish to be considered for the Research Track must formulate a plan with their HMS/HSDM faculty sponsor, then complete this Application for Eligibility and Statement of Intent and return it with the appropriate signatures to the Office of Research, as indicated on the application. Students must be in good academic standing at the School of Dental Medicine to be considered.

Step 2: Application Review and Notification

All candidate applications will be reviewed by a designated review committee. Candidates will be notified of their acceptance status in the early part of spring semester. Candidates who are accepted into the Research Track will proceed as outlined in Step 3. Candidates who are not accepted are still strongly encouraged to participate in the courses and activities offered in their area of interest.

Step 3: Track Activities and Thesis

Candidates who are accepted into the Research Track can begin their activities immediately following acceptance. Once the Track requirements are met and the project is completed, students can begin thesis development. If, since coming to Harvard School of Dental Medicine, you have already completed original research, or plan to do so, this is an opportunity to bring your work to a meaningful conclusion. This thesis will be an in-depth piece of writing that describes your project and incorporates principles learned from the required track activities to make a unique contribution to the field. This thesis may or may not be based on your first year summer research experience, and will be **in addition to** and **supersede** the document completed for the Office of Research in Year 2. Your thesis should reflect scholarly effort and good background knowledge. The preparation of the thesis will require a significant commitment of time and effort. Input from the faculty sponsor and other faculty members should be actively sought during this process.

Your thesis, written in English, should include:

- Title Page
- Abstract
- Table of Contents
- Glossary for any abbreviations
- Introduction (background including an up-to-date literature review, state of field, purpose of inquiry)—not more than 15 pages
- Methods
- Results (observations, data analysis)
- Discussion, Conclusions, and Suggestions for Future Work—not more than 20-25 pages
- Summary
- List of references annotated in text
- Tables and Figures

Once all requirements are completed, you will be notified that you have been recognized for completing the track. This will be designated on your official transcript.

Honors in Research

You must be accepted into a Track to be considered for Honors in a Special Field. After you have completed all track requirements and submitted your thesis, you will be notified if your thesis is recommended for honors. If you accept this recommendation, you must submit your thesis for oral examination to the Honors Committee. If approved for oral examination, your thesis will be reviewed by two expert readers in the field.

DMD Class of 2016 Student Defense Guidelines For Honor's In Research

1. Student must submit their abstract to the Office of Research by March 1, 2016.
2. Dean for Research selects 4 potential examiners and notifies the student by March 8, 2016.
3. Student must schedule defense (April 20-30, 2016) with 2 of the 4 examiners by March 21, 2016.
4. Student must distribute final thesis to examiners and Office of Research by April 1, 2016.
5. This final thesis must be signed off by the student's research mentor.
6. Examiners send a summary email on the strengths and weaknesses of the thesis to the Office of Research by April 15, 2016. These summaries are forwarded to the students immediately.
7. Students defend their thesis some time between April 20-30, 2016.
8. Student's mentor may not attend the defense as a silent observer.
9. At the conclusion of the defense, examiners must complete a grade sheet along with a comment sheet on their initial impression of the thesis document and the final impression of the defense.
10. Examiners must not discuss the grade sheet with the student or advisor.
11. Examiners must deliver the grade sheet to the Office of Research.
12. The Faculty Research Committee meets in late April to discuss honor's candidates.
13. A final grade is determined and feedback is given to the student.
14. The grade is submitted to the Office of Dental Education in early May 2016.

This is one of two mechanisms by which the DMD degree is awarded with honors (*cum laude*, *magna cum laude*, *summa cum laude*) at Harvard School of Dental Medicine. General Honors (the other mechanism) will supersede Honors in a Special Field. Please note: the Honors process is highly competitive, and only students who are accepted into a Special Field Track will be eligible for consideration in Honors in a Special Field. **In order to be considered for Honors in a Special Field, you must defend your thesis (oral examination). Oral examination does not guarantee honors will be granted, even if all requirements have been met.** Oral examinations are held during March and April. Exams may be scheduled with short notice at any time during that period, including vacation weeks. **Students should be prepared for their oral exam from the date of the thesis submission.**

ADDITIONAL RESEARCH OPPORTUNITIES

TAKING A YEAR OFF FOR RESEARCH

You may take a year (or more) off for research and pursue a 5+ year DMD course, at any stage after your second year. Most students who do this take it between years 2 and 3. Students have taken time off to pursue MPH, MPP, and PhD degrees, or just to experience what it is like to do research full-time. To take time off for research, you must obtain initial approval from the Office of Dental Education and the Office of Research (please contact Dawn DeCosta for more information).

You must then schedule a formal proposal meeting with the Office of Research. At this meeting, you will provide an outline of your plans for your year off including what exactly you plan to do, where it will take place, and who will oversee your work and provide resources and a possible back-up plan in case there is a major problem with your planned project.

Once the Office of Research approves your plan, you must submit the Routing Form in this guidebook (page 16), signed by your Mentor, the Dean for Research, and the Dean for Dental Education. Along with this form, please attach a 3-page proposal of your research project, where it will take place, and who will oversee your work and resources.

Please note, during and after your approved year off for research, you must 1) submit a 6-month progress report to the Office of Research; 2) have a manuscript in publishable format or submitted for publication, OR write and defend a thesis prior to graduation; and, 3) present a poster at Student Research Day prior to graduation.

We will also require a short report/evaluation to be written by your mentor. In most cases, students will be charged tuition for their first 4 years, and in the 5th year they will be charged a registration fee. For more information, students should contact the Office of Dental Education.

PHD PROGRAM

Between years 2 and 3 of dental school, students may take time off (usually 4-5 years) to complete a PhD in Biological Sciences in Dental Medicine (BSDM). This program is administered through the Graduate School of Arts & Sciences. More information on the program is available at:

http://www.gsas.harvard.edu/programs_of_study/biological_sciences_in_dental_medicine.php.

Students interested in applying to the BSDM program may do so during their second year of dental school. The application deadline is in early December each year. If you would like to speak with DMD students who are in the program, or need further information, please contact Leanne Jacobellis, the BSDM program administrator.

ACADEMIC, PROFESSIONAL, AND SCIENTIFIC CONDUCT

PREPARATION OF PAPERS AND OTHER WORK

All homework assignments, projects, lab reports, papers and examinations submitted for a course are expected to be the student's own work. Students should always take great care to distinguish their own ideas and knowledge from information derived from other sources. The term "sources" includes not only published or electronic primary and secondary material, but also information and opinions gained directly from other people. It is each student's responsibility to understand the expectations of academic integrity, proper forms of citation, and submission of one's own work. In addition, collaboration in the completion of assignments is prohibited unless explicitly permitted by the instructor, in which case it must be acknowledged.

AUTHORSHIP GUIDELINES

Authorship is an explicit way of assigning responsibility and giving credit for intellectual work. The two are linked. Authorship practices should be judged by how honestly they reflect actual contributions to the final product. Authorship is important to the reputation, academic promotion, and grant support of the individuals involved, as well as to the strength and reputation of their institution. The Faculty Council of Harvard Medical School has endorsed the following statement. Although authorship practices differ from one setting to another, and individual situations often require judgment, variation in practices should be within these basic guidelines.

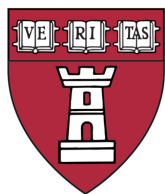
- Everyone who is listed as an author should have made a substantial, direct, intellectual contribution to the work. For example (in the case of a research report) they should have contributed to the conception, design, analysis and/or interpretation of data. Honorary or guest authorship is not acceptable. Acquisition of funding and provision of technical services, patients, or materials, while they may be essential to the work, are not in themselves sufficient contributions to justify authorship.
- Everyone who has made substantial intellectual contributions to the work should be an author. Everyone who has made other substantial contributions should be acknowledged.
- When research is done by teams whose members are highly specialized, individual's contributions and responsibility may be limited to specific aspects of the work.
- All authors should participate in writing the manuscript by reviewing drafts and approving the final version.
- One author should take primary responsibility for the work as a whole even if he or she does not have an in-depth understanding of every part of the work.

EXAMINATION RULES

In order to avoid improper behavior during an examination, students should refrain from communication with other students while an exam is in progress. They should neither retain nor refer to any books, papers or other resources during an examination except with the express permission of the instructor. For violation of the examination rules or dishonesty in an examination a student may be required to withdraw from the Dental School. Students who fail to obey the instructions of an examination proctor are liable to disciplinary action.

SCIENTIFIC INTEGRITY

In setting standards of practice for scientific and clinical research, the Faculty of Medicine at Harvard University has endorsed several guidelines or procedures which relate to ethical conduct. Students who perform research are advised to familiarize themselves with these policies in order to perform research of the highest integrity. This information is available in the document *Faculty Policies on Integrity in Science*, available online at <<http://hms.harvard.edu/content/faculty-policies-integrity-science>>.



APPLICATION FOR ELIGIBILITY: Research Track

Due no later than December 1 of Year 4

Please return completed application materials to:

Dawn M. DeCosta
Office of Research
Harvard School of Dental Medicine
188 Longwood Avenue - REB404
Boston, MA 02115
Tel: 617-432-1121

All information must be typed or printed legibly.

Personal Information

Name _____
Last First Middle/Maiden

Society _____ Year of Graduation _____ Previous Degree(s) _____

Harvard ID# _____ E-mail _____

Address _____

Phone _____

Academic Information

Senior Tutor _____
Print name Signature for approval to apply to Track

Proposed Project Mentor _____ E-mail _____

Research Proposal

Please attach a 3-5-page proposal for the project you plan to conduct. Please indicate a research category (or two) into which your project would best fall e.g. Basic Science, Clinical, Translational etc. The proposal should be similar in structure and detail to the one written for your Year 1 summer project. You may include details of an ongoing/proposed larger project for clarity, but must indicate clearly what your independent role is expected to be. Indicate whether this project will build on your first-year summer research or is a new project and explain how you plan to fit the work into your academic schedule. Include your project mentor's biosketch.

APPLICATION: Research Track (continued)

Required Track Activities

You must spend at least 6 months, including the Fourth Year elective month, performing research on a noteworthy study. In this time you are expected to generate rigorous data leading to clear conclusions that reflect a novel discovery. This discovery must be deemed by experienced researchers to have significantly advanced the field in which the study is performed.

Scholarship

Anticipated Completion Date

Project

Thesis

To be completed by March 1 of graduation year

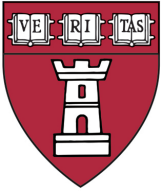
Student Statement of Intent to Complete the Research Track

It is my intent to complete all requirements for the Research Track. I understand that all requirements outlined above must be completed prior to March 1 of graduation year.

Signature

Date

DMD FORMS



HSDM DMD STUDENTS TAKING A YEAR OFF FOR RESEARCH ROUTING FORM

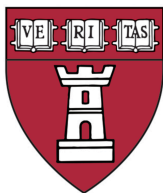
As soon as you think about pursuing a year off for research, you must obtain initial approval from the Office of Dental Education and the Office of Research. You must then schedule a formal proposal meeting with the Office of Research. Detailed instructions on preparing for this meeting can be found in this Guidebook.

Once the Office of Research approves your plan, you must submit: 1) this Routing Form signed by your Mentor, Dean for Research and Dean for Dental Education, and 2) a 3-page proposal of your research project similar to the SMO proposal discussed on page 7.

Date:	
Name of Student:	
Class:	
Project Title:	
IRB/IACUC Protocol #:	
Name of Research Mentor:	
Mentor Contact Information: <i>Please include mailing address, phone number and e-mail address</i>	
Research Mentor's <i>Signature</i> :	
Dr. Bjorn R. Olsen, Dean for Research <i>Signature</i> :	
Acting Dean for Dental Education <i>Signature</i> :	

Please return this form to the Office of Research (REB Room 408).

DMD FORMS



APPLICATION FOR RESEARCH TRAVEL FUNDS from the HSDM Office of Research

The HSDM Office of Research considers funding requests from students who are traveling to present research at national and regional meetings and conferences. Students may receive up to \$500 per fiscal year (July 1-June 30) in research travel funding.

If you need to present a poster at a research event and your Mentor/PI does not have resources to pay for your poster printing, the HSDM Office of Research will reimburse you for the printing of your poster. We recommend using phdposters.com for printing. Please follow the guidelines on their site. You will be able to pick up your poster at 375 Longwood Ave. (If you submit your poster using your @hsdm.harvard.edu email, or any harvard.edu account, you should not be charged tax.) We are unable to reimburse any shipping fees or rush charges.

Please note that we cannot fund all requests, nor can we consider requests that are not research-related.

Please submit this completed form (either printed or by email) to Dawn DeCosta along with:

- Confirmation of acceptance to present research at conference/meeting, including title of research presentation
- Receipts or proof of payment for all reimbursement/funding requested

Student: _____

Degree program: _____

Expected year of graduation: _____

Travel dates: _____

Conference or meeting name: _____

Location and conference/meeting dates: _____

Title of research poster/presentation: _____

Name of Research Mentor: _____

Have you applied, or do you plan to apply, for other HSDM funds to support this trip? If so, please specify the amount and the department/offices from which you have requested funding.

Total amount of funding requested: _____

Please describe what the funding will cover (poster printing, airfare, hotel, conference registration, etc.):

For Student Research Mentor: I have reviewed this funding request and approve this student's application for travel funds.

(Signature and date)

Mentor's name (printed): _____

If your mentor is not local, please ask him/her to email approval of this application to Dawn DeCosta (dawn_decosta@hsdm.harvard.edu).