Status of Genetics Education in U.S. Dental Schools

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Abstract: Genomics research is rapidly increasing our understanding of the genetic basis of normal and abnormal growth, development, and disease. Genetic information and technologies are also being applied to develop new diagnostic and treatment strategies. Many diseases with dental, oral, and craniofacial manifestations have a genetic basis. Effective clinical application of genomics to oral medicine will depend on the education of health care professionals, the general public, and policymakers. Dentists must understand genetics to provide accurate information to patients and be able to discuss benefits and limitations of the biological, clinical, and ethical issues related to genomic-based health care. Genetics education in dental schools will significantly impact the integration of genetics into oral medicine. Fifty-three U.S. dental schools completed a survey in 2001 to assess the status of genetics curricula in dental schools in the United States. Ninety-four percent of schools did not require genetics education for entry to dental school, and a formal genetics course was conducted in only eight of the fifty-three schools (15 percent). The genetics education currently offered to undergraduate dental students is not standardized, and the content varies considerably among schools. These findings suggest more emphasis on genetics education is needed in U.S. dental schools.

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Thousands of monogenetic conditions are known, and for many of them, the underlying gene defects have been identified.[1] A significant number of these conditions have dental, oral, and craniofacial manifestations.[2] Emerging scientific and clinical research findings suggest that prevalent dental pathologies such as dental caries and periodontal diseases also have genetic components of susceptibility. These conditions affect significant portions of the population.[3] Oral health status has recently been linked to a number of systemic conditions including diabetes and cardiovascular disease.[4] Studies of these disease conditions suggest that multiple gene and gene-environment interactions are important determinants of susceptibility. While there remains much to learn about the pathophysiology of these conditions, molecular genetics is providing the knowledge and tools to define diseases at the cellular and molecular levels. In addition to the biological insights gained by studies of genetic diseases, genomic research has increased our understanding of the molecular biology of normal growth and development. These advances are transforming the pace and breadth of basic and clinical research. The rapid advances in our understanding of genetics at the scientific level are likely to yield significant practical applications for the diagnosis and treatment of clinical diseases.[5] The pairing of genomic information and technologies has ushered in the genomic era, in which expectations are high that utilization of genetic information will improve health care in dramatic fashion.[6-8]

It is increasingly apparent that genomics and related technologies will be incorporated into all aspects of health care, including dentistry. Advances in genomics will lead to improvements in the field of oral medicine in the areas of understanding disease etiology, pre-symptomatic testing, development of more robust disease nosology, diagnosis, and development of more effective prevention and treatment strategies. While the scope and impact of genomics on the practice of dentistry may be debated, the increasing clinical relevance of genetics for dentistry is clear. We must consider the role of oral health care providers in this rapidly evolving environment. As technology advances and genetic testing becomes increasingly available, dental clinicians are likely to face challenges (including understanding technical

information and psychosocial issues) when offering testing and analyzing results without proper genetics education.[9] To effectively integrate genetic concepts and principles into dental medicine, clinicians and their support teams will need to understand genetics. Dental clinicians will need to provide expert guidance to patients and policymakers. To provide accurate information to patients to help them make informed decisions, dentists must be prepared to discuss the benefits and limitations of the biological, clinical, and ethical issues related to genomic-based health care.

Dental schools are charged with providing important basic training to prepare dentists for clinical practice and lifelong learning. The role of genetics in dental curricula has been evaluated in the past, and recommendations to increase genetic content in curricula have been made.[10-12] In the pre-genomics era, genetics training was not prominent in most undergraduate dental school curricula. However, curricula must change as knowledge changes. Given the rapid advances in genomics and the increasing application of genetic information and associated technologies to medicine, we conducted a questionnaire survey of U.S. dental schools on the eve of completion of the Human Genome Project. The primary goal of this study was to assess the current state of genetics education in dental school curricula in the United States in 2001. The specific aims were to assess:

- the number of schools that require prospective students to have taken genetics as a prerequisite,
- whether dental schools conduct a formal genetics course for their students,
- how dental schools currently integrate genetics concepts into other courses if they do not provide a formal genetics course,
- the amount of time devoted to various genetics topics, and
- the perceived need for genetics education in dental schools.

Methods

Based on discussions with our colleagues, we constructed a survey to assess various components of genetics education in U.S. undergraduate dental curricula. The survey incorporated ideas from previous surveys such as Sanger and Stewart's 1975 survey,[10] which inquired about admission requirements, whether there was a formal genetics course, the need for instructional material, and details about the nature of formal genetics courses such as the department of faculty who taught in the course and the number of lecture hours.

The survey administered for the study reported in our article had two parts. All schools were requested to answer six questions. For one of these questions ("Is there a specific course solely dedicated to teaching genetics?"), depending on whether the answer was "yes" or "no," respondents were asked to answer a second set of questions. The survey appears in Appendix A.

The names of the associate deans or directors of curriculum or academic affairs for all U.S. dental schools were obtained through the 2001 American Dental Education Association directory; these individuals served as the contact for each institution. Code numbers were assigned to the schools to maintain confidentiality and were used as tracking devices to contact those schools that did not respond to the first request for survey completion. Approval was sought through the University of Pittsburgh's Institutional Review Board (IRB), and "exempt" status was granted.

A database was constructed using the computer program Progeny 2000 (Progeny Software, South Bend, IN). Data were analyzed using standard statistical methods, such as mean values and percentages. Mean values, standard deviations, and minimum and maximum values were calculated using Excel, and t-test scores were calculated for appropriate questions.

Results

A total of fifty-four questionnaires were distributed, one to each dental school in the United States during 2001. A total of fifty-three out of fifty-four of these schools replied, providing a response rate of 98.15 percent. Most schools (94 percent) did not require genetics as an admission requirement; one did but indicated not knowing "how it is applied." One school highly recommended genetics prior to admission, one school recommended it as an elective, and one school did not respond to this question (Table 1). Eight schools provided a formal course in genetics for dental students while the remaining forty-five reported that they did not.

Most respondents (86.54 percent) believed that dental students were adequately prepared for the

Table 1. Summary of first two survey questions

Question	Yes	No	Recommended	Don't Know
Is there a genetics admission requirement for entering the dental school? (N=52)	1 (1.92%)	49 (94.23%)	2 (3.85%)	0
Is there a specific course solely dedicated to teaching genetics? (N=53)	8 (15.09%)	45 (84.91%)	N/A	0

Table 2. Summary of survey questions 3-6

Question	Yes	No	Don't Know	Mixed
Do faculty think that genetics in curriculum is adequate to prepare students for the board exam? (N=52)	45 (86.54%)	3 (5.77%)	4 (7.69%)	N/A
Do faculty and/or students perceive a need for genetic education in the curriculum? (N=52)	32 (61.54%)	14 (26.92%)	3 (5.77%)	3 (5.77%)
Would you be interested in obtaining educational material? (N=51)	45 (88.24%)	6 (11.76%)	0	N/A
Would you be interested in obtaining self-instructional material? (N=51)	45 (88.24%)	6 (11.76%)	0	N/A

Table 3. Summary of answers to survey questions if school reported not having a formal genetics course (forty-five schools in this category)

Question	Yes	No	Don't Know
Are there plans for a genetics course in the future? (N=45)	3 (6.67%)	38 (84.44%)	4 (8.89%)
Was there a genetics course in the past? (N=45)	4 (8.89%)	41 (91.11%)	0
Is there a lack of appropriate faculty? (N=45)	14 (31.11%)	27 (60%)	4 (8.89%)
Is there a perceived lack of faculty interest? (N=45)	10 (22.22%)	23 (51.11%)	12 (26.67%)
Is there a lack of time in the curriculum? (N=44)	23 (52.27%)	19 (43.18%)	2 (4.55%)
Is genetics integrated into other classes? (N=45)	44 (97.78%)	1 (2.22%)	0

National Board Dental Examination based on their current level of genetics in the curriculum (Table 2). Of fifty-two respondents, most (61.54 percent) did perceive a need for genetic education in their curriculum, and most (88.24 percent) also expressed interest in obtaining educational materials.

Of those forty-five schools that did not provide a formal genetics course in 2001, most (84.44 percent) did not have plans to provide a genetics course in the future (Table 3). Most schools (60 percent) did not believe there was a lack of appropriate faculty to teach a genetics course, although a lack of time in the curriculum was reported by just over half of the respondents. Forty-five schools (84.91 percent) reported that genetics was integrated into other classes.

Of the forty-five schools that reported genetics to be integrated within the curriculum, one school could not specify which courses integrate genetics, and one noted that it operated a problem-based learning (PBL) curriculum and, as such, reported that genetics was integrated throughout numerous classes but could not identify specific courses (Table 4). Another school indicated that its curriculum had PBL-style learning, but was able to indicate which classes integrated genetics concepts and was, therefore, included in the tabulation. Classes that were reported to integrate genetics topics within course content are shown in Table 4. Genetics was reported to be integrated into both basic science and clinical courses.

Table 4. Courses into which genetics is integrated for schools without a formal genetics course (N=44)

Course	Number of Schools
Anatomy	14
Biochemistry	33
Embryology	24
Histology	21
Immunology	14
Microbiology	28
Pathology	31
Pediatric Dentistry	16
Periodontics	13
Oral Surgery	5
Other	18

Table 5 summarizes the amount of time devoted to genetics-related topics within other classes in the curriculum. For all categories, one or more schools indicated that a particular genetic topic was included in the curricula without indicating the specific amount of time dedicated to the subject. These schools were included in the tabulation of schools that included the genetics topic in a course; however, they were not included in the calculation of mean and standard deviations. The number of hours devoted to particular genetic topics varied greatly. For example, for molecular biology, the number of hours ranged from one to forty.

A distinct undergraduate genetics course was conducted by eight dental schools in 2001. All eight schools with a formal course indicated that it was required for students to graduate. One school included a clinical experience (visit to clinic) for the course, one did not know if a clinical component was included, and the remaining six schools did not include a clinical component. These eight schools reported an average of 30.25 lecture hours (standard deviation = 22.8hr) for their genetics courses. The range of lecture hours was nine to eighty hours. The mean number of hours of genetics instruction in the schools with formal genetics courses (30.25) exceeded the mean number of hours of total genetics in the schools without a formal genetics course (21.94 (sd = 21.66hr)). Of the eight schools that described a formal course, all provided information about course topics addressed in the class. The topics included in these formal genetics course are summarized in Table 6.

Six schools (75 percent) reported that the genetics course is taught by dental school faculty, one is taught primarily by medical school faculty, and one did not indicate. The department to which the instructor belonged varied. In fact, schools utilized instructors from various departments inside as well as outside of the dental school. One of the survey

Table 5. Specific genetics concepts integrated into curricula without a formal genetics course

Topic	Mean (standard deviation)	Minimum	Maximum	Number*
Molecular Biology	8.00 (7.55)	1	40	40[1]
Cytogenetics	2.07 (2.22)	0.5	11	28[2]
Inheritance Patterns	2.32 (3.51)	0.5	20	32[3]
Pedigree Symbols	1.16 (0.78)	0.25	2.57	17[4]
Methods	1.90 (0.78)	0.5	3	21[5]
Mapping	1.46 (1.71)	0.1	8	21[6]
Ethics, Social, Legal Issues	1.25 (0.60)	0.5	3	19[7]
Pharmacogenetics	1.15 (0.61)	0.25	2	15[8]
Intervention (Treatment)	1.86 (1.56)	0.25	6	24[9]
Diagnostics	2.14 (2.23)	0.5	10	29[10]
Growth and Development	4.19 (4.04)	1	16	34[11]
Genetic Counseling	1.31 (0.85)	0.5	3	11[12]
Population Genetics	1.73 (1.60)	0.5	6	13[13]
Orofacial Applications	3.50 (4.68)	1	25	31[14]
Total Hours	21.94 (21.66)	0.75	121	45

*Number of schools providing hours of class time for each topic:
[1]Only 38 schools provided an amount of class time and were, therefore, included in the calculation of the mean; [2]26 schools; [3]31 schools; [4]16 schools; [5]19 schools; [6]19 schools; [7]18 schools; [8]12 schools; [9]22 schools; [10]27 schools; [11]33 schools; [12]10 schools; [13]12 schools; [14]27 schools.

respondents noted that 90 percent of genetics instructors for the formal course were from the department of human genetics in the medical school, whereas 10 percent were dental school faculty. Dental school departments that provided instructors were: molecular and cell biology, orthodontics, craniofacial genetics, oral biology/sciences, pathology, and pediatric dentistry. Medical school departments that provided instructors included pediatrics, biochemistry, human genetics, and molecular biology.

Lastly, school representatives were asked to provide any additional comments they felt were important. While one school emphatically voiced the opinion that genetics has no place in the dental curriculum, several expressed the desire to include more genetics in the curriculum.

Table 6. Genetics topics included in schools with formal genetics course (of eight schools with a course)

Course	Number of Schools
Molecular Biology	5 (62.5%)
Cytogenetics	7 (87.5%)
Inheritance Patterns	8 (100%)
Pedigree Symbols	8 (100%)
Methods	6 (75%)
Mapping	5 (62.5%)
Ethics	5 (62.5%)
Pharmacogenetics	4 (50%)
Treatment	6 (75%)
Diagnostics	8 (100%)
Growth and Development	5 (62.5%)
Genetic Counseling	7 (87.5%)
Population Genetics	6 (75%)
Orofacial Applications	6 (75%)

Discussion

The purpose of this survey was to evaluate the state of genetics education in U.S. dental schools in 2001. The findings of the survey are reported in more detail, together with a more thorough discussion, in Dudlicek.[13] With only one dental school requiring a formal genetics course for admission, it seems to be the consensus that genetics is not an essential fundamental topic prior to entering dental school. Students do receive genetics instruction in dental school, but the quality and quantity vary greatly. In general, it was reported that genetics instruction is believed adequate to prepare students for the National Dental Board examinations. Most respondents perceived a need for genetic education in the curriculum, and most were interested in supplemental genetic educational materials. From the survey, it is not possible to gauge if there is a perceived need for additional genetics education or if most felt the genetic education was appropriate to prepare students for clinical practice.

The survey results indicate that most of the forty-five dental schools that did not offer students a formal genetic course did not plan to offer such a course in the future. Interestingly, four schools conducted a genetics course prior to 2001, but eliminated the course from the curriculum. While no explanation is offered for why 85 percent of dental schools do not have a formal genetic course, most (~98 percent) respondents reported that genetics is integrated into the curriculum already. Just over half of the respondents indicated that there is a lack of time in the curriculum, and this may be an impediment to developing a course in an already busy curriculum. Also of interest, lack of appropriate faculty and lack of faculty interest were not reported to be factors (Table 3).

In the majority of U.S. dental schools, genetics is integrated into basic science and clinical courses. Genetics is taught in a variety of different courses; the specific genetic topics, the courses in which they are taught, and the time spent on each genetic topic vary from a superficial mention to an in-depth review. Genetics was most frequently reported as taught in pathology, biochemistry, and microbiology. The genetic content in pathology primarily reflected genetic diseases. In biochemistry, genetics was primarily related to the structure of DNA and the central dogma of DNA transcription to RNA and subsequent translation to protein. Genetics taught in microbiology related primarily to microbial and viral genetics. Evaluation of the survey responses indicated a lack of standardized human genetic education in most U.S. dental schools.

Only eight of the fifty-three dental schools (15 percent) reported a formal genetics course. The genetic content of most of these courses appeared to cover similar basics—for example, inheritance patterns, pedigree symbols, and diagnostics. Although not standardized, the formal genetics courses among different institutions did seem to have similar scopes of content, and most of the topics included in the survey were reportedly present in the courses. With

the exception of Growth and Development, all topics were included in more programs that have a formal genetics course as compared to those programs that integrate genetics within their curriculum. A comparison of specific genetics topics presented in genetics education for schools with a genetics course and those without such a course illustrates this point (Table 7).

The most recent previous review of genetics in dental school curriculum was performed in 1975 and reported by Sanger and Stewart.[10] There were fifty-six U.S. dental schools in 1975 and fifty-four in 2001. Forty-six schools (82 percent) responded to the 1975 survey, and fifty-three (98 percent) responded to the 2001 survey. A comparison of those questions that were similar between the two studies is shown in Table 8. In both studies, one school had a genetics admission requirement (2 percent), indicating no change over the twenty-six years. The number of schools that have a formal course decreased by one; nine schools (19.5 percent) had a course in 1975 compared to eight (15 percent) in 2001. Fewer schools have plans for such a course, comparing the two studies: 13.5 percent versus 6.67 percent. Whereas the faculty shortage present in 2001[14] compared to 1975 may be a factor in these findings, there is a notable increase in mean hours in time spent teaching genetics from the 1975 survey compared to the 2001 survey. While the change in mean hours of genetics education in dental schools is well short of the longstanding calls to increase the genetics content of dental schools, it does appear to represent a move in the right direction.

There have been discussions of the importance of genetics in dental education over the years, including suggestions for its inclusion in dental school curricula already crowded with basic science courses, laboratory courses, and clinical experience.[6,10-12,15-21] Few of these specific suggestions and recommendations have been integrated into undergraduate school curriculum. While the scope of genomics influence on oral medicine and delivery of oral health care may be debated, the fact that genomics will be increasingly important for oral health care is undeniable. As basic and clinical research generates larger and more complex genomic datasets, and as the information and technologies are increasingly applied to genomic medicine, the influence on oral medicine will grow at an increasing pace. To fully participate in the translation of genomics to oral medicine, dentists must be more rigorously educated in concepts and principles related to genomics. A more concerted

Table 7. Comparison of genetics subtopics in schools that teach a formal genetics course versus schools that do not teach a formal genetics course

Topic	Schools with Genetics Course	Schools with No Genetics Course
Molecular Biology	62.5% (5/8)	88.9% (40/45)
Cytogenetics	87.5% (7)	62.2% (28)
Inheritance Patterns	100% (8)	71.1% (32)
Pedigree Symbols	100% (8)	37.8% (17)
Methods	75% (6)	46.7% (21)
Mapping	62.5% (5)	46.7% (21)
Ethics, Social, Legal	62.5% (5)	42.2% (19)
Pharmacogenetics	50% (4)	33.3% (15)
Treatment	75% (6)	53.3% (24)
Diagnostics	100% (8)	64.4% (29)
Growth and Development	62.5% (5)	75.6% (34)
Genetic Counseling	87.5% (7)	24.4% (11)
Population Genetics	75% (6)	28.9% (13)
Orofacial Applications	75% (6)	68.9% (31)

Table 8. Comparison of 1975 and 2001 studies

Question	1975 Study	2001 Study
Is there an admission requirement?	1 (2.17%)	1 (1.89%)
Is there a formal course?	9 (19.5%)	8 (15%)
Are there plans for a future course?	5/37 (13.5%)*	3/45 (6.67%)
Number of hours of genetics instruction if integrated	4 (+/-4**) (37 schools)	21.94 (+/-21.66) (45 schools)
Number of lecture hours of genetics course	14 (+/-11.0**) (range 4-18)	30.25 (+/-22.8) (range 9-80)
Total responses	46 of 56 schools (82%)	53 of 54 schools (98%)

*Paper reported percentage as 11% (5 out of 46 schools). Percentage in table is 5 out of 37 (37 is number of schools that do not have a formal genetics course).
**Standard deviations not reported in paper. Figures are derived, and values are presumed to have same degree of deviation as 2001 study.

effort to reform genetic content in U.S. dental schools appears to be needed.

To develop an effective genomics-related education model for dental schools, dental educators may benefit by considering approaches utilized by other medical disciplines such as medicine and nursing.[22-26] In addition, professional organizations with an interest and expertise in genetic education of health care professionals, such as the American Society of Human Genetics, the National Society of Genetics Counselors, and the National Coalition for Health Professional Education in Genetics (NCHPEG), may provide expert guidance. Collaborative efforts such as the creation of a task force with representation from these organizations may help in development of content and competencies for dental school genetics curricula.[27] This will require a concerted effort, as well as the inclusion of expert resources in education and genomics from within and from outside of the traditional dental profession.

Summary

Genetics concepts and principles will underlie many new diagnostic and treatment strategies in health care in the coming years.[5,8,28] If dental clinicians are to participate in development and clinical implementation of these new approaches, they will need to understand genetics. If dental students are to be prepared for lifelong learning, it is important for them to have a working knowledge of genomics to facilitate integration of this new information. This survey represents the most comprehensive evaluation of genetics education in U.S. dental schools. From the results, it is apparent that the presentation of genetics in U.S. dental schools is not standardized, and as such, the genetics content presented to students varies greatly. It is hoped that these data will form the basis for developing additional tools to further assess how to integrate genetics into the dental curriculum. Curriculum models, course designs, and competencies are all issues that must be evaluated. Educators may benefit from the experiences of other health fields, medicine, nursing, pharmacology, and expert organizations in these efforts. Given the shortage of dental faculty, it may be wise to leverage efforts to develop a core genetics curriculum that is available to all dental schools. In this way, common teaching experiences may also benefit from the continued reevaluation and development of such a course.

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Appendix 1. Questionnaire for survey of genetics in dental curriculum

Please circle or check the appropriate response.

1. Is there a genetics admission requirement for entering your dental school? Yes / No

2. Is there a specific course *solely dedicated* to teaching genetics (basic principles, DNA structure, human applications)?
Yes (please skip to 2B) / No (please answer 2A)

2A. If no (there is not a course on genetics), please answer the following:

2A-1. Are there plans for such a course in the future? Yes / No / Don't Know

2A-2. Was there a genetics course in the past? Yes / No / Don't Know

2A-3. Is there a lack of appropriate faculty? Yes / No / Don't Know

2A-4. Is there a perceived lack of interest from faculty? Yes / No / Don't Know

2A-5. Is there a lack of time in the curriculum? Yes / No / Don't Know

2A-6. Are elements of genetics taught, or integrated, into other classes? Yes / No

If yes, please check the appropriate box(es) from the following list of subjects:

☐ Anatomy
☐ Biochemistry
☐ Embryology
☐ Histology
☐ Immunology
☐ Microbiology
☐ Pathology
☐ Pediatric dentistry
☐ Periodontics
☐ Oral surgery
☐ Other (please specify) _____

2A-7. Which of the following genetics topics are covered within these classes?

	Approx. # class hrs.
☐ Molecular biology (transcription, translation, DNA structure/function)	_____
☐ Cytogenetics (study of chromosomes)	_____
☐ Inheritance patterns (Mendelian ☐ Complex ☐)	_____
☐ Pedigree symbols	_____
☐ Methods of research and diagnostic technology	_____
☐ Mapping and the Human Genome Project	_____
☐ Ethics, social, and legal issues related to genetics	_____
☐ Pharmacogenetics	_____
☐ Clinical intervention (treatment of genetic conditions)	_____
☐ Diagnostics of genetic diseases (genetic screening and testing)	_____
☐ Growth and development	_____
☐ Genetic counseling	_____
☐ Population genetics	_____
☐ Orofacial applications	_____

2B. If yes (genetics is taught in a separate class on its own), please answer the following:

2B-1. What does the class include? (please check each that applies)

☐ Molecular biology (transcription, translation, DNA structure/function)
☐ Cytogenetics (study of chromosomes)
☐ Inheritance patterns (Mendelian ☐ Complex ☐)
☐ Pedigree symbols
☐ Methods of research and diagnostic technology
☐ Mapping and the Human Genome Project
☐ Ethics, social, and legal issues related to genetics
☐ Pharmacogenetics
☐ Clinical intervention (treatment of genetic conditions)
☐ Diagnostics of genetic diseases (genetic screening and testing)
☐ Growth and development
☐ Genetic counseling
☐ Population genetics
☐ Orofacial applications

Continued on next page

Appendix 1. Questionnaire for survey of genetics in dental curriculum *(Continued)*

2B-2. How many lecture hours is the class?_____ credit hours?_____
2B-3. Is the class ☐ required or ☐ an elective?
2B-4. Is there a clinic experience in the course? Yes / No / Don't Know
2B-5. Is the class offered to predoctoral students? ☐ postdoctoral students? ☐
2B-6. How long has the class been taught?_____
2B-7. Is the course taught by dental school faculty? Yes / No / Don't Know
2B-8. To what department do(es) the instructor(s) belong? _____
2B-9. Is the course team-taught? Yes / No / Don't Know
2B-10. How often is the course offered (semester, year)?_____

3. Do faculty think that genetics in the curriculum is adequate to prepare students for the board exam?
   Yes / No
4. Do faculty and/or students perceive a need for genetic education in your curriculum?
   Yes / No
5. Would you be interested in obtaining educational material on genetics for your students?
   Yes / No
6. Would you be interested in self-instructional material, such as a CD-ROM program?
   Yes / No

Your comments are greatly appreciated:

_____
_____
_____
_____
_____
_____

Please check here if you do *not* want your institution mentioned in the acknowledgment of the publication. ☐

In the event we need to clarify information, we may wish to contact you. Please check here if you do *not* agree to be contacted. ☐

Please check here if you would like to receive a copy of the results from this survey when available. ☐

Thank you again for taking the time to complete this survey in order for us to collect accurate information. Please return this survey to the address below or fax to 412-XXX-XXXX. Your cooperation is more than greatly appreciated.

Attn: Laura Dudlicek
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