Scholars Collaboration in Teaching and Learning

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BIOGRAPHICAL SKETCH

NAME	POSITION TITLE
Fitzmaurice, Maryann	Associate Professor of Pathology

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
Iowa State University, Ames, IA	B.S.	1973	Biochemistry
Case Western Reserve University, Cleveland, OH	Ph.D.	1982	Experimental Pathology
Case Western Reserve University, Cleveland, OH	M.D.	1983	Medicine
Cleveland Clinic Foundation, Cleveland, OH	Residency	1983-1987	Anatomic & Clinical Pathology
Cleveland Clinic Foundation, Cleveland, OH	Fellowship	1987-1988	Immunopathology

A. Professional Experience:

1985-1987 Instructor, Department of Basic Sciences, Ohio College of Podiatric Medicine, Cleveland, OH
1988-1990 Clinical Associate, Department of Pathology, Cleveland Clinic Foundation, Cleveland, OH
1990-1991 Surgical Pathologist, Department of Pathology, Henry Ford Hospital, Detroit, MI
1991- Surgical Pathologist and Medical Director of Immunohistochemistry Laboratory, Department of Pathology, University Hospitals of Cleveland, Cleveland, OH
1992- Assistant Professor of Pathology, School of Medicine, CWRU, Cleveland, OH
1992- Visiting Scientist, G.R. Harrison Spectroscopy Laboratory, Massachusetts Institute of Technology, Cambridge, MA
2002- Adjunct Assistant Professor of General Medical Sciences (Cancer Center), CWRU
2005- Associate Professor of Pathology, School of Medicine, CWRU, Cleveland, OH

B. Honors and Awards:

1974-1978 National Graduate Medical Sciences Traineeship, Department of Pathology, CWRU
1987 Stowell-Orbison Award for Pathologists-in-Training, United States and Canadian Academy of Pathology
2000 Excellence in Teaching Award, Department of Pathology, University Hospitals of Cleveland

C. Educational Activities

Medical Student Teaching:

1976-1981 Core Academic Program (Year 1 & 2), CWRU School of Medicine; *Teaching Assistant and Tutor*
1985-1987 Department of Basic Sciences, Ohio College of Podiatric Medicine*, Instructor*
1992- Core Academic Program, CWRU School of Medicine
Homeostasis (Section II-Cardiovascular Committee-Year 2); *Faculty*
1993-1994 Core Academic Program, CWRU School of Medicine
Biological Basis of Disease (Section I-General Pathology-Year 1); *Section Co-Leader and General Pathology Committee Chairman*
1993- Core Academic Program, CWRU School of Medicine
Biological Basis of Disease (Section I-General Pathology-Year 1); *Faculty*
2005- Millennium Curriculum Revision, CWRU, School of Medicine
Year 1 Pathology Block; *Member*

Medical Technologist Training:

1984-1989 School of Medical Technology, Cleveland Clinic Foundation; *lecturer*

Medical Resident/Fellow Training:

1992- Morbidity and Mortality Conference, University Hospitals of Cleveland
1996-2000 Oncology Tumor Board, University Hospitals of Cleveland
2000- Heart Transplant Morbidity and Mortality Conference, University Hospitals of Cleveland

Pathology Resident/Fellow Teaching Conferences:

1992- Autopsy Gross Conference, Department of Pathology, University Hospitals of Cleveland
1992- Anatomic Pathology Didactic Lecture Series, Department of Pathology, University Hospitals of Cleveland
1992- Scopicon (Unknown Slide Conference), Department of Pathology, University Hospitals of Cleveland

1992- Surgical Pathology Gross Conference, Department of Pathology, University Hospitals of Cleveland

School of Medicine Committees:

1993 Pathology Medical Education Committee, Department of Pathology, CWRU; *Member*

1993-1994 Examination Committee, Core *A*cademic Program, CWRU School of Medicine; *Member*

Hospital Committees:

1990-1991 Surgical Pathology Fellowship Committee, Department of Pathology, Henry Ford Hospital; *Member*

1997-1998 Pathology Residency Restructuring Committee, Department of Pathology, University Hospitals of Cleveland; *M*ember

D. Educational Self-Improvement

1992-1995 CWRU School of Medicine, Annual Educational Retreat, *Attendee*

E. Educational Publications and Products: None

F. Peer-Reviewed Publications with Medical Students and /Pathology Residents/Fellows as Co-Authors (*Underlined authors were medical students or pathology residents/fellows at the time of publication)

1. ***Fitzmaurice M*,** Bordagaray JO, Engelmann GL, Richards-Kortum R, Kolubayev T, Feld MS, Ratliff NB and Kramer JR: Argon ion laser-excited autofluorescence in normal and atherosclerotic aorta and coronary arteries: Morphologic studies. *Am Heart J* 118:1028-1038, 1989.
2. Fischler D, ***Fitzmaurice M*** and Ratliff NB: Quadricuspid Aortic Valve. *Am J Cardiovascular Pathol* 3:91-94, 1990.
3. Girgis RE, Rosman H, del Busto R, ***Fitzmaurice M,*** and Silverman NA: Porcine bioprosthetic aortic valve endocarditis with ring abscess and aortic stenosis. *Henry Ford Hospital Medical Journal* 39:123-125, 1991.
4. Baraga JJ, Rava RP, ***Fitzmaurice M,*** Tong LL, Taroni P, Kittrell C and Feld MS: Characterization of the fluorescent morphological structures in human arterial wall using ultraviolet-excited laser-induced microspectrofluorimetry. *Atherosclerosis* 88:1-14,1991.
5. Verbunt R JAM, Cothren RM, ***Fitzmaurice M,*** Ratliff NB, Kittrell C, Taroni P, Baraga J, Feld M and Kramer JR: Characterization of ultraviolet laser-induced autofluorescence of ceroid deposits and other structures in atherosclerotic plaques as a potential diagnostic for laser angiosurgery. *Am Heart J* 123:208-216, 1991.
6. Amin MB, Gottlieb CA, ***Fitzmaurice M,*** Gaba AR, Lee MW and Zarbo RJ: Fine needle aspiration cytology study of myofibroblastoma of the breast: immunohistochemical and ultrastructural findings. *Am J Clin Pathol* 99:593-597, 1993.
7. Manoharan R, Baraga JJ, Rava RP, Dasari RR, ***Fitzmaurice M*** and Feld MS: Biochemical analysis and mapping of atherosclerotic human artery using FT-IR microspectroscopy. *Atherosclerosis* 103:181-193, 1993.
8. Brennan JF, Romer TJ, Wang Y, ***Fitzmaurice M***, Lees RS, Kramer JR Jr, Feld MS: In situ histochemical analysis of human coronary artery by Raman spectroscopy compared with biochemical assay. *Proceedings of EOS/SPIE 2324:181*-193, 1994.
9. Romer TJ, ***Fitzmaurice M***, Cothren RM, Richards-Kortum R, Petras R, Sivak MV, Jr., Kramer JR, Jr. Laser-induced fluorescence microscopy of normal colon and dysplasia in colonic adenomas: Implications for spectroscopic diagnosis. Am J Gastroenterol 90:81-87, 1995.
10. Romer TJ, Brennan JF 3rd, ***Fitzmaurice M***, Feldstein ML, Deinum G, Myles JL, Kramer JR, Lees RS, Feld MS. Histopathology of human coronary atherosclerosis by quantifying its chemical composition with Raman spectroscopy. Circulation 97:878-885, 1998.
11. Deinum G, Rodriguez D, Romer TJ, ***Fitzmaurice M***, Kramer JR, Feld MS. Histological classification of Raman spectra of human coronary artery atherosclerosis using principal component analysis. Appl Spectroscopy 53:938-942, 1999.
12. Buschman HP, Motz JT, Deinum G, Romer TJ, ***Fitzmaurice M***, Kramer JR, van der Laarse A, Bruschke AV, Feld MS. Diagnosis of human coronary atherosclerosis by morphology-based Raman spectroscopy. Cardiovasc Pathol 10:59-68, 2001.
13. Nigro KL and ***Fitzmaurice M***: Surgical Pathology II NO. SPII 04-2 (SPII-286) Aortitis of the Ascending Aorta: Giant Cell Aortitis. *ASCP Check Sample* 28(2): 11-23, 2004.

PERSONAL STATEMENT

Career Path: I am an alumnus of the Case School of Medicine and obtained my Ph.D. in Experimental Pathology from Case in the combined degree program that preceded the current Medical Scientist Training Program. Following medical school, I completed a residency in Anatomic and Clinical Pathology and a fellowship in Immunopathology at the Cleveland Clinic Foundation. I am Board Certified in Anatomic and Clinical Pathology and have been in clinical practice as a surgical pathologist since 1988, first at the Cleveland Clinic Foundation, then at Henry Ford Hospital in Detroit, MI. In 1992, I joined the faculty at Case and became a surgical pathologist and Medical Director of the Immunohistochemistry Laboratory at University Hospitals of Cleveland. Throughout, I have pursued a career combining patient care, research and medical education. My primary research area of interest is in the development of new optical spectroscopy techniques and instrumentation for the diagnosis and imaging of cancer and high-risk atherosclerotic cardiovascular disease, *in vivo*, in real time, at the patient bedside - by analyzing the interaction of light with human tissue. I also have an appointment as a Visiting Scientist at the Laser Biomedical Research Center at the Massachusetts Institute of Technology (MIT).

Commitment to Medical Education: I am actively engaged in the education of medical students, pathology residents and fellows, graduate students and post-doctoral fellows not only here at Case and University Hospitals of Cleveland, but also at MIT and the Harvard Medical School (through the Harvard-MIT Health Sciences and Technology Program).

I started my career in medical education as a tutor and then a teaching assistant in the Core Academic Program at the Case School of Medicine, during my M.D.-Ph.D. training program. During my residency years, I continued to teach as an instructor at the Ohio College of Podiatric Medicine, where I co-taught their required course in Pathology. In 1992 I joined the faculty of the Case School of Medicine, and began teaching in the Core Academic Program. In 1993-1994, I took over temporarily for a colleague as Section Co-Leader and General Pathology Chairman for the Biological Basis of Disease Committee in Year 1 of the Medical School curriculum, which provides medical students with the fundamentals of pathology, immunology and infectious disease. I continue to teach in that committee, participating in small group sessions and proctoring the pathology laboratories in that and the Cardiovascular Committee in Year 2 of the Medical School curriculum, assisting medical students in looking at pathology slides under their own microscopes. I also lecture on Cardiovascular Pathology in the Cardiovascular Committee and in a graduate student course on the Pathophysiology of Disease (Anatomy 523).

As a surgical pathologist, I also work closely with the pathology residents and fellows on a daily basis, training them, one-on-one, at two-headed microscopes at “surgical sign out” or on “heart valve rounds”. This also includes sophomore medical students who elect to do a pre-doctoral pathology fellowship year and rotate through surgical pathology. My resident educational activities also include a number of teaching conferences, including the Surgical Pathology Gross Conference, a conference I started to test the residents developing skills by challenging them with surgical specimens as unknowns. Over the years, I have co-authored 4 surgical pathology case reports with pathology residents as first authors. In

2000, I received the Excellence in Teaching Award from the Pathology Residents at University Hospitals.

I have also supervised many medical students who participated in my basic science and clinical research as part of their medical education. I have served on the Ph.D. Thesis Committees of 5 graduate students at Case, Harvard and MIT, including one student who was awarded a combined M.D.-Ph.D. degree through the Harvard-MIT Health Sciences and Technology Program. And I have co-authored 9 peer-reviewed research publications with medical students (8 of 9 first or second authors).

Benefits of participation in the Scholars Collaboration in Teaching and Learning: Like most of the faculty who teach in the medical school, I have no formal training in education. Until now, I have done little in the way of educational self-improvement, except attending occasional Case School of Medicine Educational Retreats. As I have become involved in the Millennium Curriculum revision at the School of Medicine, I have come to realize that I have fallen into the trap of performing my medical school teaching using largely the traditional techniques of didactic lectures and proctoring of small group sessions and histology slide laboratories. And I have had difficulty in breaking away from that format and seeing new and different ways to teach pathology to medical school students, particularly techniques that give the student more control over what they learn and how they learn it. In this, I am surprised at myself, as I am an alumnus of the Case School of Medicine. As a combined degree student at Case, I liked the freedom the curriculum gave me to focus my studies on the parts of the curriculum that would be most applicable to my chosen specialty of pathology - freedom that I seem reluctant to afford the students I teach today.

By participating in the Scholars Collaboration in Teaching and Learning, I hope to learn more about alternative approaches to medical school education. I am particularly interested in finding out more about principles of adult learning, different learning styles and innovative approaches to teaching in both large and small group settings. It has been my experience that small group sessions in the current Case medical school curriculum are painful for both the faculty and the students, despite recent innovations in the pathology portion of the BBD I committee, including student presenters who are provided with topic-related PowerPoint presentation templates with virtual microscopy. I have talked to the students in my small group sessions and, for the most part, they are as much at a loss as I as to how to make the small group sessions more interesting and an overall better use of their time. Through the Scholars Collaboration in Teaching and Learning, I hope to work with the students to make the medical school curriculum work better for them. And to make teaching the medical school curriculum more interesting and challenging for me.

The project I have proposed, PathologE Crossword Puzzles, is a very modest attempt to try to be more innovative in my pathology teaching. While I hope that the Scholars Collaboration in Teaching and Learning can help me to accomplish my PathologE Crossword Puzzle project, a more important goal of participation in the Scholars Collaboration in Teaching and Learning is to obtain an armamentarium of tools that I can use to revitalize my pathology teaching not only for medical students, but for pathology residents and fellows as well.

ABSTRACT

Problem: Teaching of pathology as a subject in medical school has been somewhat unconventional at Case, due to its integration into the organ system approach, and has used more active learning and electronic resources than many subject areas. This project will build on this success through the use of interactive, electronic, pathology (PathologE) crossword puzzles. **Goals:** The goal of this project is to create PathologE crossword puzzles, posted on the medical school electronic curriculum, to test the students' fund of knowledge in both the basic principles of the pathogenesis of disease and organ specific pathology. These puzzles will be used: 1) as an active, independent study technique as an alternative to more passive and larger group formats for learning; 2) to provide students with alternatives to textbooks, syllabus, class notes, etc. for exam preparation; and 3) to provide students with alternatives to current online educational resources in pathology, such as e-textbooks, e-atlases and on-line quizzes in more conventional formats. **Description:** PathologE crossword puzzles will be created for each committee using pathology topic areas as themes. Existing online crossword puzzles will be used to learn about interactive electronic puzzles and get ideas for web site display. Crossword puzzle creator freeware available on the Internet will be used to help layout the puzzles and format the clues/answers. Puzzles can be created in different formats with different difficulty levels, ranging from simple matching type formats to more complex formats using crossword puzzle type clues. And they could be made interactive, with links to hints and/or additional information about the pathology topics in the clues/answers. **Evaluation:** Student usage and the quality and effectiveness of the puzzles will be assessed using online questionnaires, email feedback and student feedback meetings. Committee chairs and faculty will also be asked for their feedback. **Lessons: I** hope to learn whether or not students will use the crossword puzzles as educational tools and which formats/difficulty levels are the most effective. **Questions:** Overall, I would like to explore the educational value of crossword puzzles and other games, particularly electronic games that are more often viewed as entertainment, as applied to the field of pathology.

PROPOSAL

Problem/question: Pathology teaching in medical school has been somewhat unconventional at Case due to its integration into the organ system approach, and has used more active learning than many subjects through the use of microscopy laboratories and, this year, student-led small group sessions. Electronic educational resources have also been used, such as e-textbooks and e-atlases and, this year, virtual pathology in small group sessions. This project will build on these successes and incorporate more resources for active, independent (as opposed to large or small group) learning in pathology using electronic pathology (PathologE) crossword puzzles.

Goals: The goal of this project is to use PathologE crossword puzzles as an educational tool to more actively engage medical students in their pathology education by taking advantage of their interest in and experience with electronic games. The PathologE crossword puzzles will test the students' fund of knowledge in both the basic principles of the pathogenesis of disease and organ specific pathology. They will be used: 1) as an active, independent study technique as an alternative (or adjunct) to more passive and larger group formats for learning; 2) to provide students with alternatives to textbooks, syllabus, class notes and past exams for exam preparation; and 3) to provide students with alternatives to current online educational resources in pathology, such as e-textbooks, e-atlases and on-line quizzes in more conventional formats.

Preparation: I got the idea to use crossword puzzles as a tool for teaching pathology while working a crossword puzzle in an airline magazine during a transcontinental flight. Most crossword puzzles have a title or theme that inspires the clues and answers, and I thought the pathology topics covered in the medical school curriculum could be used as puzzle themes. PathologE crossword puzzles could be created and made available to students as part of the medical school electronic curriculum. And they could be could be made interactive, with links to hints and/or additional information about the pathology topics in the clues/answers.

I think that pathology is a particularly good topic for crossword puzzles, as I have often thought that my job as a surgical pathologist is very like that of a detective, solving the diagnostic puzzle from the histologic clues seen through the microscope. And I am not alone in that thought, as an online Pub Med search revealed 155 publications between 1972 and 2005 that likened the process of clinical and pathologic diagnosis (or the understanding of disease pathogenesis) to solving a puzzle, some of which gave the specific example of a crossword puzzle.

In fact, as I am proposing an internet-based educational technique, I did most of my preparation for this proposal online, and I found that there are innumerable crossword puzzles posted on the Internet, some of which are used for pathology education. There are web sites offering online crossword puzzles as supportive materials for a basic pathology textbook, "Introduction to Human Disease (6th Ed.)" by Leonard Crowley, published by Jones and Bartlett (http://health.jbpub.com/humandisease) and a course on "Pathology for Physical Therapists" given by Stephen Lahr at Ithaca College (www.ithaca.edu/faculty/lahr/

HistPath/path_05_index.html). Several web pages recommended crossword puzzles as optional pre- and post-lecture exercises, including one web page on the Pathology & Laboratory Medicine web site of the University of Vermont College of Medicine (www.fahc.org/pathology/Education/optional_ exercises.html). I also found pathology crossword puzzles mentioned in electronic newsletters from the ACT Pathology group in Canberra Australia (www.actpathology.act.gov) and the College of American Pathologists (www.cap.org/apps/docs/laboratory_resources/cap_news/CAPnews0704.pdf), which had used a pathology crossword puzzle as an activity for National Medical Laboratory Week. There are also general medical crossword puzzles posted on the web sites of the Student Doctor Network, a nonprofit educational web site (www.studentdoctor.net/links/Medical_Games_and_Quizzes), and the Doctor's Lounge, an online medical resource for physicians, students and allied clinical professionals that provides clinical and technical information through multimedia tutorials and other electronic study aids (www.thedoctorslounge.net/crosswords). These web sites suggest there is an avid audience for electronic crossword puzzles among medical professionals, including medical school students, and that they can be used as an effective tool for pathology education.

Methods and concise narrative: We will create PathologE Crossword Puzzles that test the students' fund of knowledge in both the basic principles of the pathogenesis of disease and organ specific pathology. These puzzles can be used by students for independent study or by faculty as homework, pre- or post-lecture (or small group) quizzes or extra credit.

The PathologE Crossword Puzzles will be created using online Internet resources. First, existing online crossword puzzles will be used to learn about interactive puzzles and get ideas for web site design for our crossword puzzles. Existing online crossword puzzle creator freeware, such as the Arensus Crossword Puzzle Editor (www.tea.ch.en), Instant Online Puzzle Maker (www.puzzle-maker.com) and EclipseCrossword (www.greeneclipsesoftware.com/eclipsecrossword), will then be used to layout the crossword puzzle and format the clues/answers. Finally, the crossword puzzles will be posted on the medical school electronic curriculum web site.

PathologE Crossword Puzzles can be created for each committee (or block in the new curriculum) around general (or organ specific) pathology topic areas, beginning with Biological Basis of Disease 1 in year 1, extending to the organ system committees if successful with BBD. For example, for the BBD 1 Committee, the topic areas (based on the 2004 curriculum) might be:

cell injury	(small group theme: steatohepatitis)
inflammation	(small group theme: ARDS
wound healing	(small group theme: diabetic ulcer)
thrombosis	(small group theme: MI/stroke)
neoplasia	(small group themes: cervical, lung and colon cancer)

Both pathology terms and images can also be used as clues. And clues can be linked to a hint (or series of hints) that give additional information that may help the student get the

correct answer. The clues/answers can also be linked to resources such as electronic textbooks, atlases, journal articles and syllabus materials that provide more detailed information on the topic.

Puzzles can also be created in different formats with different difficulty levels, such as:

easy: match a word from a list of pathology terms to list of pathology clues
moderate: fill in pathology terms by memory recall using definition type clues
hard: fill in pathology terms by memory recall using crossword puzzle type clues

Measures of quality/effectiveness: We will monitor use of the PathologE Crossword Puzzles by counting the number of hits to the crossword pages over time throughout the committee/block(s). We will also incorporate several mechanisms to get feedback on such questions as which formats/difficulty levels are most effective, including: 1) a short online questionnaire that pops up after each crossword puzzle has been completed; 2) a link for email feedback; and 3) inclusion in more conventional curriculum review activities, such as student feedback sessions.

Dissemination: The PathologE Crossword Puzzles will be available to anyone with access to the School of Medicine electronic curriculum. All year 1 and 2 Committee chairs and participating faculty will also be informed of the availability of PathologE Crossword Puzzles relating to their subject area by email and as part of written materials distributed to faculty prior to each committee/block. The chairs and participating faculty will also be contacted again by email at the end of the committee/block, and their comments/criticism solicited. Once known, the results of the project will also be written up for publication in an appropriate medical or educational journal.

Reflective critique: The PathologE crossword puzzles will be assessed for student usage, the quality and appropriateness of clues/answers, format and difficulty, and overall educational effectiveness. The number of web site hits, results of online questionnaires, and email feedback will be reviewed at least weekly during the relevant committee/blocks(s). Feedback from conventional curricular review activities such as student feedback sessions will also be reviewed as it becomes available during the committee/blocks(s). Feedback from chairs and participating faculty will be reviewed after the relevant committee/block(s) is(are) completed. The puzzles will be revised/modified as to format/content as needed before the committee/block(s) is(are) taught again the following year.

Relevance: PathologE Crossword Puzzles will allow the students to have a little fun and help make pathology learning more interesting and timely, by taking advantage of the students interest in puzzles and electronic games, making pathology learning more active and providing alternatives to more conventional learning tools such as syllabus materials and previous exams and even such online resources as electronic textbooks and atlases.