



2008

History of the Department of Microbiology and Immunology

University of North Dakota

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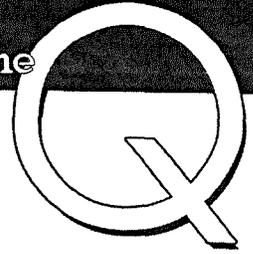
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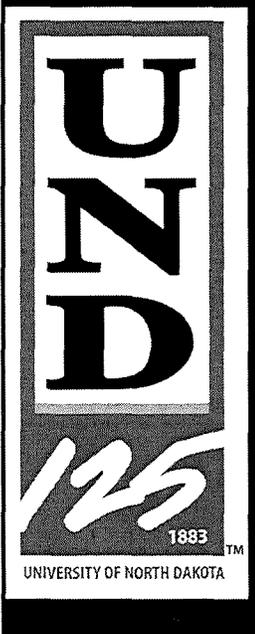
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UNIVERSITY OF NORTH DAKOTA • QUASQUICENTENNIAL • DEPARTMENT HISTORY



UNIVERSITY OF NORTH DAKOTA
1883-2008
CELEBRATING 125 YEARS

HISTORY OF THE DEPARTMENT OF
MICROBIOLOGY AND IMMUNOLOGY



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DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY

At the centennial of the University, the Department of Microbiology and Immunology will have existed as a separate department in the School of Medicine for 60 years. Teaching and research functions in the disciplines of microbiology and immunology were offered prior to that time in the Department of Pathology.

When the department was created in 1948, it was physically located on the third floor of the Old Science Building. A new building for the School of Medicine was completed in 1949—Medical Science Building—that housed the department along with other basic science departments until the Medical Sciences North Building became available in 1994. Laboratory furniture necessary for research and teaching activity within the department was not installed until 1950.

In 1948 Dr. Richard M. Marwin was named Chair of the newly formed department of Bacteriology and Immunology. Joining him was another recent graduate of the University of Minnesota, Dr. Robert G Fischer. Both individuals brought new interest in research and teaching to the School of Medicine, Dr. Marwin's interests were in the field of medical mycology and Dr Fischer's interests were in the area of virology. In 1962, Dr. Marwin stepped down as departmental chair and was replaced by Dr. Fischer who held the position until his retirement. Both individuals continued in teaching and research activity within the department until their retirement, Dr. Marwin in 1983 and Dr. Fischer in 1981.

The Master of Science degree was first offered in 1950 with Robert O'Brien and John Vennes being the first two students in the program. O'Brien subsequently completed his doctoral degree at Washington State University and Vennes completed his doctoral degree at the University of Michigan.

In 1951, Dr. Glenn L. Hoffman was hired as a third member of the departmental faculty. Dr. Hoffman was a graduate of the University of Iowa with research and teaching interests in the field of parasitology. Dr. Hoffman left the department in 1956 to assume a position with the U.S. Fish and Wildlife Service.

After completing his Master of Science degree within the department in 1952, John Vennes was hired as an instructor. He was granted a leave of absence in 1954 to complete his Doctor of Philosophy degree at the University of Michigan, earning the degree in 1957. He returned and remained within the department from that time until his retirement. His research activities included studies of microbial life in fresh water lakes and streams and in domestic and industrial wastes.

In 1963, Dr. John A. Duerre was appointed Assistant Professor in the department. Dr. Duerre completed his doctoral work at the University of Minnesota and held previous positions with the Federal Government at Argonne National Laboratory in Chicago and the Rocky Mountain Spotted Fever Laboratory in Montana. In 1965, Dr. Duerre was awarded a NIH Career Development award. This award paid Dr. Duerre's salary from

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1965 through 1975. As a result of this award, an additional staff position was available. Dr. James R. Waller was appointed to this position as Assistant Professor in 1966. He completed his doctoral work at the University of Minnesota and post-doctoral experience at University of Cincinnati School of Medicine. Dr. Waller's research program included studies of variation among *Staph aureus* strains and Group B *Strep* enzymes.

In 1966, the department was granted a Hill Research Professorship by the Hill (Northwest) Foundation of St. Paul. Dr. Vennes was named to the Hill Professorship—funding for the professorship was sufficient only to offset salary; however, it did free funds for the department to recruit an additional faculty member. The Professorship was renewed for another five years in 1971 and continued until 1976. As with other Hill awards in the School of Medicine, funding was made available for a ten year period.

As a result of the Hill Professorship, an additional faculty position was made available within the department. Dr. Fern Probstmeyer was recruited to the Assistant Professorship position in 1967. She remained a single year and was replaced in 1968 by Dr. James J. Kelleher at the Assistant Professor level. Dr. Kelleher completed his doctoral degree at Rutgers University and his post-doctoral activity at Woods Hole Oceanographic Institute. His research area was in the latency and pathogenesis of viral infections and the immune responses generated against them.

After the appointment of Dr. Kelleher in 1968, the department continued to function with six full-time faculty. However, during the period between 1973 and 1977, with Dr. Vennes working in the Office of the Dean, the functional faculty level was at five members.

In 1973, Dr. Vennes was appointed Acting Dean in the School of Medicine and Associate Dean for Curriculum. He held the Acting Dean position until 1975 and continued as Associate Dean for Academic Affairs until 1977. He returned to the Department on a full time basis in 1977 and in 1981 was appointed Chair of the department. He served in this capacity until his retirement in 1989. His service to the department and to the medical school was commemorated by naming the Vennes Atrium in his honor when the medical school moved in 1994 to the Medical Sciences North building.

In 1982, the department was renamed the Department of Microbiology and Immunology to better reflect the teaching, research, and service activities within the department.

In 1983, the department recruited Dr. Stephen Wikel, whose area of research interest was immune responsiveness to parasitic infections. Dr. Wikel was promoted to Professor in 1987, and was named as a Chester Fritz Distinguished Professor. In 1991 he departed to accept a position at Oklahoma State University. Dr. Sandra Norstedt also joined the department in 1983 as an Instructor, remaining 3 years until departing in 1986.

Dr. Kevin Young joined the department in 1985 after receiving his Ph.D. from the University of Oklahoma and post-doctoral training at Texas A & M and at the University of California Berkeley. He brought to the department an expertise in bacterial genetics

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and the bacterial cell wall. Dr. Young advanced through the ranks to become a full Professor in 1996. In 1990 he was selected as recipient of the Reverend Elmer and Min West Faculty Award.

With the retirement of Dr. John Vennes, Dr. James Kelleher became the department chair in 1989. In 1991 he recruited two new faculty members, Jon Spanier and David Reinitz. Dr. Spanier received his Ph.D. from the University of Minnesota and conducted research on the means by which *Chlamydomonas* detoxifies its immediate environment. Dr. Reinitz received his Ph.D. from the University of Illinois. His research activities concentrated on host-parasite relationships, particularly involving the African trypanosomes responsible for sleeping sickness.

By the early 90's, it was clear that the medical school required new quarters. The Edwin C. James Research Facility (ECJRF) was constructed and attached to the former St. Michael's Hospital on North Columbia Road between University Avenue and 6th Avenue. The combined structure became the Medical Sciences North building. The Department of Microbiology & Immunology moved from the Ireland Laboratories in the old Medical Sciences building and took up residence on the 4th floor of the ECJRF in 1994.

Two vacancies emerged in the department with the retirements of Dr. David Waller in 1994 and Dr. John Duerre in 1995. Their positions were filled with the recruitment in 1995 of Dr. Ann Flower as an Assistant Professor and Dr. Thomas Hill as an Associate Professor. Dr. Flower received her Ph.D. at the University of Colorado Health Science Center and went on to post-doctoral training at Princeton and at DuPont Merck. Dr. Hill also received his Ph.D. at the University of Colorado Health Science Center, as well as post-doctoral training there, before moving to Drexel University. Dr. Hill, who held a position as tenured Associate Professor at Drexel University, works on the regulation of DNA synthesis in bacteria, and has also initiated work on the phenomenon of bacterial persistence. Dr. Flower studies the mechanisms by which bacteria secrete proteins into their environments. In 2001, Dr. Flower was promoted to Associate Professor with tenure and Dr. Hill was promoted to full Professor in 2002.

Departmental members continued to be recognized for their achievements. Dr. Waller was honored by the medical students by being selected to receive the Portrait Award in 1994, his final year of service. Dr. Young received the Sigma Xi Excellence in Faculty Research Award in 1994. Dr. Kelleher received the AMWA Equity Award in 1995.

The department again faced changes when Dr. Reinitz departed in 1996, and Dr. Spanier departed in early 1998. In addition, Dr. Kelleher retired in the summer of 1997. The impact of these departures was magnified by the effects of the flood that engulfed Grand Forks and East Grand Forks in April 1997, terminating the school year. Along with other members of the community, the university and the medical school, members of the department worked valiantly to keep vital research resources intact through the disaster, and to start rebuilding. The university and medical school were able to reopen in August of that year. Although the medical school was among the most badly damaged buildings

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on campus, repairs were sufficiently completed to begin classes on schedule, and attention turned toward rebuilding the disrupted research programs.

Frances Sailer joined the department in 1997 as an Instructor to teach the undergraduate courses, and Dr. Young served as the Interim Chair while Dr. Kelleher's replacement was recruited. Together with the rest of the medical school, department faculty became heavily involved in planning for a major change in the medical curriculum, from departmentally based courses to an integrated, interdepartmental case-based curriculum.

In November of 1997, Dr. Roger Melvold arrived as the new departmental chair. He received his Ph.D. from the University of Kansas, and served previously at Harvard Medical School and Northwestern University Medical School. His expertise was in the areas of immunogenetics, transplantation genetics, and demyelinating disease.

In September of 1998, the department filled its remaining two vacancies with the arrivals of Drs. David Bradley and Matthew Nilles. Dr. Bradley received his Ph.D. from the University of South Dakota School of Medicine and additional training at the University of North Carolina and the Mayo Medical School. Dr. Nilles received his Ph.D. from Washington State University and additional training at the University of Kentucky Health Science Center. Dr. Bradley's area of expertise is immunogenetics and autoimmunity, while Dr. Nilles brought expertise in bacterial pathogenesis, concentrating on *Yersinia pestis*. Both Drs. Bradley and Nilles were promoted to Associate Professor with tenure in 2005. The department obtained several new major equipment items, including a flow cytometer/cell sorter, a bioscreen microbiology reader, a gammacell irradiator for cells and small animals, an automated cell harvester/analyzer, and improved imaging facilities. The department also invested in new computer systems and projectors for the department, including a supply of laptop computers available for faculty and students to utilize while traveling or otherwise away from the department.

The department's research programs were again recognized when it was awarded the Fellows of the University Award for Departmental Excellence in Research in 2004. In addition to the intensified research activity of the department, the department continued to also contribute significantly to the educational mission. Members of the department continued to receive recognition for their achievements and contributions. Departmental members were selected by the medical students on numerous occasions to receive the Golden Apple Award.- Dr. Kelleher in 1997, Dr. Spanier in 1998, Dr. Melvold in 1999, and Dr. Hill in 2003 and again in 2005. In 2002, Dr. Young was the recipient of the University of North Dakota Foundation/McDermott Award for Excellence in Teaching, Research or Creative Activity and Service. Also in 2002, Dr. Melvold received the Reverend Elmer and Min West Memorial Award. The 2006-07 year was a particularly rewarding one for the department. Dr. Tom Hill was the recipient of the 2007 UND Foundation/Lydia and Arthur Saiki Prize for Graduate or Professional Teaching Excellence and was also selected by the second year students as the recipient of the 2007 Portrait Award. Dr. Melvold received the 2007 Hippocratic Dignity Award in the medical school, and was also named a Chester Fritz Distinguished Professor by the

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university. Dr. Kevin Young was selected as the recipient of the 2007 William Crozier and Edith Magwood Fawcett Faculty Award.

Dr. Melvold served as chair until retiring in January 2008. Dr. Young was named as Interim Chair until a new permanent chair was recruited.

GRADUATE PROGRAMS

The department has always maintained a small, but quality graduate program. Initially the Master of Science degree was offered; the first degree being granted to Robert O'Brien in 1952. The Doctor of Philosophy degree program was initiated in 1963; Harvey Holm, presently employed by the Environmental Protection Agency in Athens, Georgia, was the first recipient of the degree in 1969.

About 30 additional doctoral degrees have been awarded since 1969. More than 90 master's degrees have been awarded since the first degree was given in 1952.

Support for graduate programs within the department has come from research grants, a training grant awarded by the National Institutes of Health was operative in the department for fifteen years, graduate teaching assistantships offered by appropriated funds, and on occasion contract work with several governmental and industrial agencies.

Graduates of these departmental programs have been successful in numerous future endeavors. Many have found faculty positions in academic institutions. Others have taken positions in industry, in public health laboratories, or in hospitals/health delivery institutions. Many have gone on to other institutions for additional doctoral and post-doctoral work, and some have gone on to medical school, eventually earning M.D. degrees.

RESEARCH PROGRAMS

Research activity in the department was initiated with the formation of the department in 1948. Both Drs. Fischer and Marwin were recipients of grants from federal agencies. Over the fifty-four year history of the department to date, funding for research activity has come from many sources. They include the National Institutes of Health, the National Science Foundation, the National Cancer Institute, The US Department of Agriculture, numerous private foundations, several industries, and state and local health departments.

In 1974, the department was awarded the University Award "for excellence in research and creative work." Areas of research in the department have included:

1. Virus transmission by arthropod vectors

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2. Effects of surface-active agents on growth of pathogenic fungi
3. Bacterial physiology
4. Vitamin transport
5. Clinical bacteriology
6. Microbiology of industrial wastes
7. Microbiology of domestic wastes
8. Microbiology of fresh water lakes and streams
9. Nutrition and immunity
10. Nutrition and microbial infections
11. Diagnostic microbiology
12. Methylation reactions in microbial and animal systems
13. Virus-induced cancers in animals
14. Murine leukemia virus studies
15. Bacterial genetics
16. Bacterial cell wall structure
17. Host-parasite interactions
18. Microbial detoxification
19. Autoimmune disease
20. Transplantation
21. Mammalian immunogenetics
22. Demyelinating diseases
23. Arthritis and polychondritis
24. Immune regulation
25. Bacterial secretion systems
26. Control of bacterial DNA replication
27. Bacterial persistence
28. Bacterial virulence

In 2004, the department's research activities were again recognized by selection for the Fellows of the University Award for Departmental Excellence in Research. Over 13.5 million dollars have been received from non-appropriated funds by departmental faculty to support research and teaching programs. In a few cases, these monies were for collaborative activities with other departments within the School of Medicine, departments within other colleges in the University and to support cooperative research with the State Department of Health, municipalities in North Dakota, and industry.

TEACHING PROGRAMS

At the centennial of the University, the department finds itself active in many teaching programs. Undergraduate courses are offered to students from the college of nursing, the medical technology program, dietetics, and a variety of other disciplines including biology. Four separate courses (two lecture courses and two laboratory courses) are offered annually to accommodate these undergraduate students. These have been the responsibility of the departmental Instructor, currently Dr. Frances Sailer. In 2002, her

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position was upgraded to the Assistant Professor level. An undergraduate level course in immunology is also offered annually.

Until 2000, the curriculum in the School of Medicine presented courses in Microbiology and Immunology at the sophomore level. In 1999, a new interdepartmental, integrated curriculum was introduced for the first two years of the medical curriculum. The new curriculum was first given to first year students in the fall of 1999 and to second year students in 2000. Department members were intimately involved in planning of the various segments of the updated curriculum, and two departmental members (Drs. Hill and Melvold) served as Block Directors in its debut. The format incorporated a reduced reliance on formal lectures, an adoption of case-based learning, and an increased reliance on students to educate themselves via small discussion groups meeting several times weekly under the facilitation of faculty members. The small group discussion format has presented an interesting new educational scenario to members of the faculty and all members of the Microbiology & Immunology Department participate for an 8 week period each year.

Courses for graduate students—departmental and extradepartmental—have been offered both semesters, and occasionally during the summer sessions as well. Fifteen formal courses are offered. Specific titles of the courses offered included *Viruses*, *Clinical Virology*, *Medical Mycology*, *Microbial Physiology*, *Environmental Microbiology*, *Seminar in Microbiology*, *Medical Microbiology*, *Immunology*, *Microbial Genetics*, *Biology of Microorganisms*, *Clinical Microbiology*, *Advanced Microbiology Laboratory*, *Virology Laboratory*, *Bacterial Genetics Laboratory*, *Research*, and *Special Problems*. Later a *Microbial Pathogenesis* course was added. Most of these courses are offered every other year, although a few (e.g., seminar, research and special problems courses) are offered each year.

The department curriculum was revised in 1999 when the basic science departments introduced an integrated interdepartmental curriculum for their entering students. Together with the Departments of Anatomy & Cell Biology, of Biochemistry and Molecular Biology and of Pharmacology, Physiology and Therapeutics, a set of 4 courses were established to serve entering students in all these departments. The major course is an interdepartmentally taught course covering the basic molecular and cellular principles of biomedical science. Also established were a course in biostatistics and two seminar courses. In 2000-2001, the Microbiology and Immunology Department reviewed its course offerings in light of the new interdepartmental offerings and developing areas of departmental expertise, and streamlined its offerings.

The department also began in the late '90s to shift its graduate student profile from one made up predominantly of terminal masters degree students to one predominantly of students pursuing doctoral degrees.

A non-thesis Master of Science in Clinical Microbiology program had been initiated in 1982. This program evolved through a cooperative agreement with the Centers for Disease Control in Atlanta, Georgia. Formal graduate courses were offered each

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semester through the mechanism of teleconferencing, and were taken by individuals working full-time in hospital and clinical laboratories in North Dakota and surrounding states. Each Fall and Spring, the Centers for Disease Control presented an on-campus laboratory experience for participants in the program. In the mid-'90s, the program was moved entirely to the Department of Pathology.

A program entitled Laboratory Education for North Dakota (LEND) has also been offered. Laboratory Science Seminars are offered each semester through the teleconferencing network. Also offered are workshops and programs which can be completed at the site of the participant. The LEND program was originally co-sponsored by the Department of Microbiology and Immunology and the Department of Pathology, but passed entirely to the Pathology Department when they took over the Clinical Laboratory Science Program in the mid 90's.

THE FUTURE

Much as the '50s and '60s and '70s were periods of growth in the areas of gaining a better understanding of microbial metabolism and antibiotics, the '80s saw the development of new activities in the areas of immunology and genetic engineering. In the '90s, the availability of molecular biology techniques greatly expanded the scope of research in both microbiology and immunology, making biological phenomena analyzable at the molecular and genomic levels. Even more recently, the information provided by the human genome project and the determination of the genomes of other important research and disease organisms has provided additional stimulus. Now in the early years of the 21st century, the department looks forward to participating in these exciting fields of activity as well as continuing its active role in all aspects of the School of Medicine teaching programs.