

**MICROBIOLOGIST
QUALIFICATION STANDARD
GS-0403-5/15
AUTHORITY: 38 USC 7402**

DUTIES: Microbiologists perform professional and scientific work in connection with the identification, culture, study, control, and use of microorganisms. Most of the work is performed in a laboratory environment and is generally concerned with research and development or medical activities. The nature of the work may vary considerably with the assignment, some dealing primarily with specific kinds of microorganisms, such as the protozoa, bacteria, microparasites, algae, fungi, viruses, rickettsiae, and similar microscopic and submicroscopic forms; some being concerned with a specific field or area of work, such as immunology, serology, physiology, genetics, taxonomy, and cytology, as these fields relate to microbiology; some placing emphasis on microorganisms as pathogenic and immunizing agents; and some relating to the development and use of specific kinds of methodologies and techniques or to the use of organisms in medical, sanitary, and similar fields where the science of microbiology is applied.

REQUIREMENTS

Education: All applicants must have successfully completed a full 4-year course of study in an accredited college or university leading to a bachelor's or higher degree with major study in microbiology, bacteriology, biology or chemistry with at least 30 semester hours in biological science and 20 semester hours in the physical and mathematical sciences.

This course-work must have included:

- a. At least 10 semester hours in microbiology in such subjects as bacteriology, microbiology, immunology, serology, algology, mycology, parasitology, protozoology, rickettsiology, tissue culture, or virology.
- b. At least 10 semester hours in microbiology in such subjects as food, dairy, soil, industrial, public health, agricultural, applied bacteriology, or microbiology, genetics, physiology, metabolism, taxonomy, epidemiology, animal, or plant physiology or pathology, and similar courses, provided these courses were oriented toward the study of microorganism. (The remaining 10 semester hours may have been in other biological science courses.)
- c. Course-work in qualitative and organic chemistry or biochemistry, physics and college algebra, or their equivalent.

The quality of this course-work must have been such that it would serve as a prerequisite for more advanced courses in the field of science to which it pertains.

Qualifying Course-Work in Microbiology and Bacteriology: This standard considers microbiology to be a broad field of science encompassing a number of scientific disciplines or areas of science, the fields in which this science is applied, and related fields where the work is concerned with or involves microbiology. The scientific disciplines or areas of this science include bacteriology, immunology, serology, algology, mycology, parasitology, protozoology, rickettsiology, tissue culture, virology and similar disciplines or areas of science. The applied fields include food, dairy, public health, industrial, medical laboratories, and similar areas in which microbiology is applied. Related fields include taxonomy and systematics, plant or animal physiology or pathology, epidemiology, ecology, and similar disciplines or areas of science where the work is directly related or applied to microbiology. Except where the course-work deals with a limited and specific segment of the science, where it might be limited in usefulness, most of the work, including that dealing with the development and use of microbiological methods, procedures, and techniques, is qualifying. In interpreting the substantive value of the course-work, partial or total credit may be given for courses in related fields, depending on the degree to which it is related to microbiological work.

Experience: In addition to meeting the educational requirements stated in the preceding paragraphs, applicants must have had appropriate experience in (1) the general field of microbiology, (2) one of the specialized areas or applied fields of microbiology, or (3) a field of science directly related and applicable to microbiological work or microbiological research as follows:

GS-5: No additional training or experience needed.

GS-7: At least 1 year of professional experience in a microbiological science.

GS-9: At least 2 years of professional experience in a microbiological science which shows that the applicant has (a) a general working knowledge of microbiology or of one or more areas of specialization, (b) a working knowledge of and ability to apply the methodology required, and (c) the ability to perform work independently.

The quality of the experience, graduate study or combination of graduate study and experience must be such that it shows the applicant possesses (1) a knowledge and understanding of the laboratory techniques applied in the type of work for which the applicant is being considered, and (2) the ability to exercise independent judgement in evaluating and interpreting the results of his/her work and/or an aptitude for research work.

GS-11: At least 3 years of professional experience in microbiological science which shows that the applicant has (a) a thorough grasp and working knowledge of the science of microbiology, including an understanding of the biological and biochemical theories, laws, and principles underlying the work, (b) a working knowledge of and the ability to apply either general microbiological methodology or the specific methodology typical of the discipline or area of specialization in which the applicant is expected to work, and (c) the ability to perform difficult work with only general supervision.

GS-12: At least 3 years of professional experience in a microbiological science, or comparable professional experience in a directly related area of science where the work is microbiological in nature, which shows that the applicant has (a) a comprehensive understanding of the scientific theories, laws, and principles underlying microbiology, as well as a thorough knowledge of microbiology or one of the

areas of specialization, (b) a sound working knowledge of, and ability to apply, adapt, and develop the specific methodology required for the work, (c) the ability to work independently and perform difficult, responsible, and highly specialized work, and (d) either the ability to direct microbiological work of a highly complex nature, or the ability to plan, organize, carry out, interpret, and report on the results of work of a difficult nature.

This experience must have been equivalent in difficulty to that of the GS-11 grade in this series of positions, and must show that the applicant has a broad knowledge and understanding of the scientific principles and procedures involved, the ability to plan, conduct, and report on research as an independent investigator, and the ability to prepare the results for publication.

GS-13: At least 3 years of professional experience in a microbiological science, or a comparable professional experience in a directly related area of science where the work is microbiological in nature or can be related directly to the specific area of specialization for which the applicant is being considered, which shows that the applicant has (a) a comprehensive knowledge and understanding of the sciences underlying microbiology and of how the theories, laws, principles, and practices of these sciences apply to microbiology or to the areas of specialization in which the applicant is expected to work, and (b) a comprehensive understanding and working knowledge of the methodology applied in the applicant's work, and the ability to apply, adapt, and develop methods, procedures, and techniques to fit the needs of the applicant's specific work situation. The quality of the applicant's experience or combination of graduate study and experience should be such that it clearly shows that the applicant has (1) the ability to perform difficult, complex, and responsible microbiological work which requires the ability to plan, schedule, coordinate, and advise on special problems or phases of work, or (2) the ability to act as a consultant on work of a similar nature and difficulty. The applicant's total experience must also have demonstrated, through accomplishment, the ability to initiate and pursue to a logical conclusion (1) original scientific research of considerable importance involving and requiring extensive knowledge of several disciplines or specialized areas of microbiology, or (2) advanced original research in a limited but highly specialized complex areas of microbiology.

GS-14: At least 3 years of professional experience in a microbiological science, or comparable professional experience in a directly related area of science where the work is microbiological in nature and can be applied directly to the specialization for which the applicant is being considered, which shows the applicant has (a) a comprehensive and authoritative knowledge of microbiology and the related sciences and the ability to plan, organize, and perform exceptionally difficult and responsible work of a nature which must meet high and exacting professional standards; (b) the ability to plan, schedule, coordinate, and advise on special phases of microbiological work, and the ability to perform exceptionally difficult microbiological work, or (c) the ability to act as a consultant on work of similar nature and difficulty.

The total experience must have demonstrated, through accomplishment, (1) the ability to plan, organize, initiate, and carry out very difficult and original scientific research which requires comprehensive knowledge of scientific principles and techniques and outstanding competence in their application, or (2) the ability to assume the responsibility for the technical direction of a group of scientists engaged in difficult and complex original scientific research.

GS-15: At least 3 years of professional experience which shows that the applicant has (a) an outstanding and comprehensive knowledge of microbiology and the related sciences; and the ability to plan, direct, and conduct extremely difficult microbiological work, where the work is of major significance and the incumbent must be recognized for the applicant's outstanding professional competence and leadership in the field, or have received wide recognition for personal attainment in the field, or (b) the ability to act as a consultant on work of similar nature and difficulty.

This experience must have afforded outstanding personal recognition in the field of biological research or have demonstrated the ability to plan, organize, and administer a major research program.

SUBSTITUTION OF EDUCATION FOR EXPERIENCE

For GS-7: Successful completion of 1 academic year consisting of a full program of graduate study creditable toward meeting the requirements of an advanced degree with major study in microbiology may be substituted for the 1 year of experience.

For GS-9: Successful completion of 2 academic years consisting of a full program of graduate study creditable toward meeting the requirements of an advanced degree with major study in microbiology may be substituted for the 2 years of experience.

For GS-11: Successful completion of all requirements, including the thesis, for a Ph.D. or equivalent degree in microbiology, or in a closely related field of science, where the total training can be applied directly to the type of microbiological work the applicant will be expected to perform may be substituted for the 3 years of experience.

At the GS-12 and Higher Grades: Except for applicants who qualify for the GS-12 grade on the basis of superior graduate study, graduate study may not be substituted for the required year of experience equivalent in difficulty to that of the next lower grade.

QUALITY GRADUATES: Persons who have either a bachelor's degree, master's degree, 2 years of graduate study, or a Ph.D. degree appropriate to microbiology work as described in this standard may be rated eligible for the next higher grade; i.e., GS-7, GS-9, GS-11, and GS-12, as the case may be, provided the superior graduate criteria prescribed in OPM's "Operating Manual for Qualification Standards for General Schedule Positions," section II.E.4.(f) are met.

STUDENT TRAINEE EXPERIENCE: Appropriate student trainee experience which meets the criteria prescribed in OPM's "Operating Manual for Qualification Standards for General Schedule Positions," section II.E.3.(j), may be credited toward the GS-7 experience requirements on a month-for-month basis up to a maximum of 12 months.

QUALITY OF EXPERIENCE REQUIRED: For positions at grades GS-11 and below, applicants must show 1 year of experience at a level of difficulty comparable to that of the second lower grade in the Federal service. For grades GS-12 and above, applicants must show 1 year of experience at a level of difficulty comparable to that of the next lower grade in the Federal service. This requirement is met when applicants qualify on the basis of education as outlined above under substitution of education for experience, quality graduates, and student trainee experience.

For positions at GS-9 which involve a substantial amount of work in a specific specialized area or applied field of microbiology, at least 6 months of the experience at the second lower grade must have been in the appropriate area for which the applicant is being considered.

For the GS-11 and higher grades of such specialized positions, at least 1 year of experience must have been (1) sufficiently specialized to insure adequate familiarity with the area of specialization or applied field of microbiology involved and (2) equivalent in difficulty to that of the second lower grade in the Federal service.

For all grades and kinds of positions, in order to meet the minimum requirements, applicants must show that their total background of education, training, and experience has given them the specific knowledges, skills, and abilities needed to perform the duties of the position for which they are being considered, considering that they will be given a reasonable amount of orientation on the job.

QUALIFYING FIELDS OF GRADUATE STUDY: Graduate study used to meet the requirements of positions in grades GS-7 through GS-12 is generally considered to be fully qualifying if it placed major emphasis on such fields as microbiology or bacteriology, or on specific areas of study such as mycology, algology, protozoology, parasitology, immunology, serology, microbial genetics, or dealt with specific applied fields of microbiology, such as public health, epidemiology, etc. Graduate study in related fields, such as biochemistry, animal or plant physiology, genetics, plant pathology, insect disease control, etc., may also be pertinent, provided it involves or has direct application of microbiological work. The value of such study is judged on the basis of whether it was in a major or minor field of study, its contribution to the applicant's total background of experience and training, and its value in relation to the specific requirements of the positions for which the applicant is being considered.

COMBINATIONS OF SUPERIOR COLLEGE OR GRADUATE WORK AND EXPERIENCE: Applicants whose records show that they either met, or would have met, the superior college or graduate student requirements for GS-7, GS-9, GS-11, or GS-12 within 2 years of the time they are rated, but who did not enter the Federal service, provided their subsequent experience has been progressive and responsible and has kept them up to date in their field, and provided at least 1 year of the experience has been of a level and difficulty equivalent of the college work, may be rated eligible for the next higher professional grade, i.e., GS-9, GS-11, GS-12, or GS-13. (See OPM's "Operating Manual - Qualification Standards for General Schedule Positions.")

CREATIVE OR OUTSTANDING RESEARCH: Where applicants show positive evidence that they have performed highly creative or outstanding research, which has led or can lead to major advances in a specific area of research, or to a major advance in the field of microbiology, they may be rated on this basis for highly demanding research positions which require similar abilities in order to perform the work. Applicants who meet this criterion may be rated eligible for the next higher grade above that for which they would normally be rated, provided they have not been rated at this grade on the basis of meeting one of the superior college study requirements described in the preceding paragraphs.

To receive this credit, the work must have been creative in the sense that it developed a basic principle, concept, method, approach, or technique (or provided a body of basic information) which opened the way for major advances in the field of microbiology by providing a method of solving other problems,

opening areas of research, or providing the means of exploiting the application of the science in a major area.

SUPERVISORY OR MANAGERIAL ABILITY: The duties of some microbiologist positions involve supervisory and managerial responsibilities related to the operation of laboratories or laboratory programs, especially at the GS-12 and higher grades. For these positions, applicants must show that their experience and training have equipped them to manage a laboratory or laboratory program.

QUALIFICATIONS INQUIRIES: For all grades of these positions, confidential inquiries, including contacts with the applicants' supervisors and associates or with other persons familiar with their qualifications, may be made to obtain further information about their technical, professional, scientific, and personal qualifications, and their character and suitability for these positions.

SELECTIVE CERTIFICATION: As outlined under quality of experience, many positions in this series require highly specialized knowledges in one or more specific scientific areas or fields of microbiology, or the ability to apply highly specialized scientific techniques to problems peculiar to a specific type of research. Examining offices may restrict certification to eligibles meeting such specialized requirements or may establish registers of eligibles based upon such requirements.

BASIS OF RATING: No written test is required. Applicants' qualifications will be rated on a scale of 100, and will be evaluated on the basis of their education, training, and experience as shown in the application and on corroborative evidence obtained by Federal civil service examiners.

PHYSICAL REQUIREMENTS: Applicants must be physically and mentally able to efficiently perform the essential functions of the position without hazard to themselves or others. Depending on the essential duties of a specific position, usable vision, color vision, hearing, or speech may be required. However, in most cases, a specific physical condition or impairment will not automatically disqualify an applicant for appointment. The loss or impairment of a specific function may be compensated for by the satisfactory use of a prosthesis or mechanical aid. Reasonable accommodation may also be considered in determining an applicant's ability to perform the duties of a position. Reasonable accommodation may include, but is not limited to: the use of assistive devices, job modification or restructuring, provision of readers and interpreters, or adjusted work schedules.

RESPONSIBLE OFFICE: Human Resources and Administration/Operations, Security and Preparedness (HRA/OSP) (006), Office of the Chief Human Capital Officer (OCHCO) (05), Recruitment and Placement Policy Service (059)