

Definition of Specialties

Chemical Sciences-Incumbents in this parenthetical are distinguished from other Research Scientists by being required to analyze and draw conclusions from research studies of chemistry as related to public and environmental health. This work requires broad knowledge of chemistry in the areas of analytical chemistry, physical chemistry, organic chemistry, and biochemistry. Scientific research and investigation can also be conducted in pharmacology, toxicology, drug chemistry, food chemistry, biochemistry, environmental chemistry, clinical chemistry, immunochemistry, and molecular biology. Research study conclusions are used to improve detection and identification of chemicals and biochemicals including toxic chemicals, metabolites, nutrients, pharmaceuticals, and enzymes; assess environmental fate and transport of chemical pollutants; assess exposure pathways and body burdens of chemical pollutants in humans and biological receptors; assess relationships between body burdens and resultant health or ecological effects; to evaluate environmental or human exposures, effects, or risks; and investigate methods and technologies that have the potential to prevent adverse public and environmental health effects of chemical exposures.

Epidemiology/Biostatistics-Incumbents in this parenthetical are distinguished from other Research Scientists by being required to design, conduct, analyze, and draw conclusions from epidemiologic or biostatistical investigations. These investigations apply statistical and survey techniques and biologic theory for the purpose of describing and understanding the distribution and determinants of disease, health, and genetic conditions in the population and the response of the health care system. Subspecialties focus on infectious agents (general communicable diseases, zoonotic diseases, food borne diseases, vector borne diseases): nutrition and lifestyle factors; social or environmental factors; health promotion; chemical and physical agents in the environment; chronic diseases and injuries; detection, distribution, and treatment of genetic disorders; other genetic influences on disease; and the efficacy of public health, clinical medical, and other interventions in modifying these influences. Scientific research, disease surveillance, and epidemiologic-based investigations are conducted to identify the source of human illness or injury, to prevent or control its occurrence, and to measure the effectiveness of those controls. Scientific research, disease surveillance, and epidemiologic investigations could evaluate the entire ecology of illness occurrence at the molecular or genetic level using molecular epidemiology.

Microbiological Sciences-Incumbents in this parenthetical are distinguished from other Research Scientists by being required to analyze and draw conclusions from research studies of the microbial, viral, and immunologic aspects of infectious diseases. Work in a subspecialty requires broad knowledge in a specific area of bacteriology, parasitology, mycology, virology, microscopy, molecular biology/microbial genetics, food, and water microbiology. Research study conclusions are used to improve detection and identification of infectious disease-causing microorganisms; define mechanisms and modes of infectious disease transmission; identify mechanisms of tissue injury; support improved investigation of infectious disease outbreaks; and improve methods to prevent infectious disease transmission.

Physical/Engineering Sciences-Incumbents in this parenthetical are distinguished from other Research Scientists by being required to analyze and draw conclusions from research studies of the physical and engineering sciences relevant to public and/or environmental health. This work requires broad knowledge in Physical/Engineering Sciences in areas such as nonindustrial indoor air quality, community air quality, occupational air quality, air pollution control,

mechanical or ventilation engineering, atmospheric pollution, atmospheric physics, microscopy, material sciences, and industrial hygiene. Engineering and physical science research and investigations can be conducted in areas such as radiation safety, environmental safety, occupational safety, and water safety. Research study conclusions are used to improve detection and identification of physical agents of public and/or environmental health significance; identify sources, environmental fates, and transport of physical agents; assess exposure pathways and body burdens of physical agents in human and biological receptors; assess the relationships between body burdens and resultant health and ecological effects; and investigate technologies which have potential to protect public health and the environment from effects of exposures to physical agents. Incumbents provide consultation to industry and other governmental agencies on the scientific technological aspects of water safety, radiation safety, environmental safety, and occupational safety as appropriate to technical expertise.

Social/Behavioral Sciences-Incumbents in this parenthetical are distinguished from other Research Scientists by being required to apply the theoretical models and research methods of the social/behavioral sciences, particularly the disciplines of psychology, sociology, anthropology, economics, and political science as they relate to public health issues. Work in this parenthetical requires knowledge in one or more of these disciplines to conduct analyses of personality, community, cultural, family, economy, and policy on health, health behavior, treatment, and disease prevention in California. This specialty carries out scientific work related to the evaluations of public health programs. Among the factors the incumbent examines for health behavior implications are: social and economic trends, race, social and economic inequality, economic impacts and cost factors of policies, ethnic diversity, personality and psychological factors, individual and organizational performance, community dynamics and structure, and community and statewide decision making and policy development. The results of this research would be used in developing new effective public health prevention programs focused on preventing unhealthful behaviors and promoting health by behavior modification through health education.