

## About the Authors

**Brian Balmer** is professor in science policy studies in the Department of Science & Technology Studies at University College London. His research interests combine historical and sociological approaches and include military technology and arms limitation, particularly the history of chemical and biological warfare. His books include *Secrecy and Science: A Historical Sociology of Biological and Chemical Warfare* (Ashgate, 2012) and *Britain and Biological Warfare: Expert Advice and Science Policy 1935–65* (Palgrave, 2001).

**Sonia Ben Ouagrham-Gormley** is an associate professor in the School of Policy, Government & International Affairs at George Mason University (GMU). She holds affiliations with GMU's Biodefense Program, Center for Global Studies, and the Department of History and Art History. She received her PhD in development economics from the Ecoles des Hautes Etudes en Sciences Sociales (EHESS) in Paris; and a graduate degree in strategy and defense policy from the Ecoles des Hautes Etudes Internationales in Paris. Ben Ouagrham-Gormley is the author of *Barriers to Bioweapons: The Challenges of Expertise and Organization for Weapons Development* (Cornell University Press, 2014).

**Seth Carus** is a distinguished research fellow at the Center for the Study of Weapons of Mass Destruction at the National Defense University (NDU). A Johns Hopkins University PhD in political science, his research focuses on issues related to biological warfare, including threat assessment, biodefense and the history of biological warfare. He has written a monograph — *Bioterrorism and Biocrimes: The Illicit Use of Biological Agents in the 20th Century* — and several articles on allegations of biological agent use. Carus has been at NDU since 1997.

**Marie Chevrier** is professor of public policy and chair of the Department of Public Policy and Administration at Rutgers University, Camden, NJ. Her research focuses on analysis of arms control negotiations and implementation, in particular on negotiations to control chemical and biological weapons. She has written widely on the Biological Weapons Convention, and is author of *Arms Control Policy: A Guide to the Issues* (Praeger, 2012) and coeditor of *Incapacitating Biochemical Weapons: Promise or Peril?* (Lexington Books, 2007).

**Jacob Cohn** is vice president of governmental affairs (Europe and MENA) at Bavarian Nordic, where he has been for 7 years. An international biotech company developing and manufacturing novel cancer immunotherapies and vaccines for infectious diseases, Bavarian Nordic has through extensive and long-term partnerships with various governments established a unique knowledge of global preparedness in the biodefence space. During his time at the company, Cohn has strengthened Bavarian Nordic's links with a range of national governments as well as the Biological Weapons Convention, the World Health Organization, NATO, the EU Commission and the Directorate-General for Health, among others. Before joining Bavarian Nordic, Cohn had 10 years hands-on experience supplying medicine in disaster or war zones and in developing areas, including dealing with Ebola and Marburg virus disease that Bavarian Nordic is now working to develop vaccines against.

**Leonard A. Cole** is an adjunct professor of emergency medicine at the Rutgers New Jersey Medical School, where he directs the program on terror medicine and security. A Columbia University PhD in political science, Cole has researched, taught and written extensively on biowarfare- and bioterrorism-related issues, and is the author of *Clouds of Secrecy: The Army's Germ Warfare Tests over Populated Areas* (1988), *The Eleventh Plague: The Politics of Biological and Chemical Warfare* (1997) and *The Anthrax Letters* (2003) — which was named an Honor Book by the New Jersey Council for the Humanities. Trained in both the health sciences and public policy, Cole has testified before congressional committees and made invited presentations to the U.S. Department of Energy, U.S. Department of Defense, the Centers for Disease Control and Prevention, and the Office of Technology Assessment. He is on the Advisory Board of the International Institute for Counter-Terrorism.

**Nancy D. Connell** is professor and vice-chair for research in the Division of Infectious Disease in the Department of Medicine at Rutgers New Jersey Medical School and the Rutgers Biomedical Health Sciences. A Harvard University PhD in microbiology, Connell's major research focus is antibacterial drug discovery in respiratory pathogens such as *M. tuberculosis* and *B. anthracis*; recent work focuses on the use of predatory bacteria as novel therapeutics for bacterial infections. She is Director of the BSL3 facility of Rutgers' Center for the Study of Emerging and Re-emerging Pathogens, and chairs the university's Institutional Biosafety Committee. Connell is a member of the Board on Life Sciences of the National Academies of Sciences (NAS). She has served on a number of NAS committees including the *Committee on Advances in Technology and the Prevention of their Application to Next Generation Biowarfare Agents* (2004), *Trends in Science and Technology Relevant to the Biological Weapons Convention* (2010), and the *Committee to Review the Scientific Approaches used in the FBI's Investigation of the 2001 Bacillus anthracis mailings* (2011). Connell is currently chairing the *Standing committee for Faculty Development for Education About Research with Dual Use Issues in the Context of Responsible Science and Research*

*Integrity*, which has directed a series of workshops held in Jordan (2012), Malaysia (2013), Trieste (2014), India, Istanbul and Egypt (2015).

**John Ellis van Courtland Moon** is emeritus professor of history at Fitchburg State University. He has written widely on chemical and biological weapons, arms control and war, including *Confines of Concept: American Strategy in World War II* (1988) and, with Erhard Geissler, the SIPRI volume *Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945* (Oxford University Press, 1999). He is a member of the extended arms control community and a participant in Harvard University's Kennedy School international security seminar.

**Nicholas G. Evans** is a postdoctoral fellow in biomedical ethics at the Department of Medical Ethics and Health Policy at the University of Pennsylvania, and a 2015 Emerging Leaders in Biosecurity fellow at the UPMC Center for Health Security, Baltimore. His research focuses on dual-use research of concern in the life sciences, and in particular the ethics of liberty-limiting measures to prevent the misuse of life sciences research and technology. His edited collection (with Tara C. Smith and Maimuna S. Majumder), *Ebola's Message: Public Health and Medicine in the 21st Century*, will be published with MIT Press in 2016.

A Cambridge graduate, **Toby Ewin** worked at the Ministry of Defence, Cabinet Office and Joint Terrorism Analysis Centre from 1980–2010. In 2009–2010, he was a visiting scholar at the Centre for the Study of Terrorism & Political Violence at the University of St. Andrews. He is currently a visiting senior research fellow at the Centre for Science and Security Studies at King's College London. Ewin was appointed an Order of the British Empire (OBE) in 2002.

**Melissa Finley** is a principal member of the International Biological and Chemical Threat Reduction (IBCTR) program at Sandia National Laboratories. With expertise in infectious diseases of livestock,

laboratory diagnostics, disease control and laboratory proliferation risk assessments, she contributes extensively to assessments of biological threats. She leads the team's engagement work in Iraq and Afghanistan, and she has conducted laboratory biorisk assessments there as well as visited numerous bioscience facilities internationally. Finley received her D.V.M. from Colorado State University, and continued her clinical training with a residency in large animal medicine at Cornell University. She received a PhD in pharmacology from Kansas State University, and was a post-doctoral fellow at the Salk Institute from 2001 until she started working at Sandia in 2005.

**David R. Franz** served as Commander of the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) and as Deputy Commander of the US Army Medical Research and Materiel Command. He retired as Colonel after 27 years on active duty. Prior to joining the Command, he served as group veterinarian for the 10th Special Forces Group (Airborne). He served as a committee member for the National Academy of Sciences study *Biotechnology Research in an Age of Terrorism*, and as a charter member of the National Science Advisory Board for Biological Security (NSABB). A Kansas State University D.V.M. and Baylor College of Medicine PhD in physiology, he currently holds an adjunct professorship in the Department of Diagnostic Medicine and Pathobiology in the College of Veterinary Medicine at Kansas State University. His current research interests focus on the role of international engagement in public health and the life sciences as a component of global biosecurity policy. Domestically he continues to encourage thoughtfulness when regulating research in the name of security to minimize negative impact on progress in the life sciences.

**Jennifer Gaudioso** leads the International Biological and Chemical Threat Reduction (IBCTR) program at Sandia National Laboratories. IBCTR aims to enhance United States and international security by promoting safe, secure and responsible use of dangerous biological and chemical agents, and the program has organized many international conferences, trainings and workshops to build local capacity to

address these issues. In the last 5 years, the team has visited facilities in more than 40 countries specifically to consult on biosecurity and chemical security issues. A Cornell University PhD in chemistry, Gaudioso has served on the National Academy of Sciences' *Committee on Education on Dual Use Issues in the Life Sciences* and is currently on the *Anticipating Biosecurity Challenges of the Global Expansion of High Containment Biological Laboratories* committee. She has also served on Sandia's Institutional Biosafety Committee, is coeditor of *Laboratory Biorisk Management* and *Laboratory Biosecurity Handbook*, and is an active member of the American Biological Safety Association.

**Chandré Gould** is a senior research fellow in the Governance, Crime and Justice Division of the Institute for Security Studies and editor of the journal *South African Crime Quarterly*. Between 1996 and 1999 she was an investigator and evidence analyst for the South African Truth and Reconciliation Commission, where she was involved in the investigation of Project Coast — the chemical and biological weapons program of the apartheid government. After 1999 Gould continued research into Project Coast. She coauthored a monograph with Peter Folb — *Project Coast: South Africa's Chemical and Biological Warfare Programme* — published by the United Nations Institute for Disarmament Research, and numerous papers and articles. She also coauthored *Secrets and Lies: Wouter Basson and the Chemical and Biological Warfare Programme* (Zebra Press, 2002) about the trial of Dr Wouter Basson. Gould has been a member of South Africa's Council for the Non-Proliferation of Weapons of Mass Destruction (NPC) (2007–2010), and a member of the Biological Weapons Working Group of the NPC for the past 6 years. She is a member of the Standing Committee on Biosafety and Biosecurity of the Academy of Science of South Africa, and was a member of the consensus study panel that produced the report titled *The State of biosafety and biosecurity in South Africa* in 2015. A Rhodes University PhD in history, Gould's current work is focused on violence prevention and criminal justice issues in South Africa.

**Gigi Kwik Gronvall** is a senior associate at the UPMC Center for Health Security and an associate professor at the University of

Pittsburgh School of Medicine and Graduate School of Public Health. A Johns Hopkins University PhD in immunology, her work addresses the role of scientists in biosecurity — how they can diminish the threat of biological weapons and how they can contribute to an effective technical response against a biological weapon or a natural epidemic. She has published and lectured extensively on issues that affect scientists and the practice of science, including laboratory security and personnel security, the need for and process of procuring medical countermeasures, the management and governance of dual-use biological advances, and the approach the U.S. should take to ensure national security while promoting new advances in biotechnology. Gronvall is the author of *Preparing for Bioterrorism: The Alfred P. Sloan Foundation's Leadership in Biosecurity*, in which she describes the major grants that represented Sloan's investments in civilian preparedness, public health law, law enforcement, air filtering in buildings, influenza preparedness and business preparedness, and constructs a chronicle of early gains in U.S. efforts to confront the threat of bioterrorism. She is currently working on a second book about the governance and risks of synthetic biology.

A professor of sociology at Boston College for 25 years, **Jeanne Guillemin** has for the last 10 years been a senior fellow in the security studies program at Massachusetts Institute of Technology. Trained as a medical anthropologist at Harvard and Brandeis Universities, she became engaged in research in the 1980s on two Cold War controversies involving potential violation of the Biological Weapons Convention. One was the U.S. allegation that the Soviet Union had been complicit in using mycotoxins as weapons in Southeast Asia (the “yellow rain” controversy), with the implication that it possessed an offensive capability. The 1979 anthrax outbreak in Sverdlovsk, USSR, precipitated further questions about the Soviet Union's possible pathogen production at the city's military base. In both cases, Guillemin's work focused on victim accounts as a means of verifying actual events. Since then, she has written on the history of biological weapons, including post-WWII proliferation and President Nixon's 1969 decision to abolish the U.S. offensive program, which

promoted momentum for the 1972 creation of the BWC. Her books include *Anthrax: The Investigation of a Deadly Outbreak* (University of California Press, 1999) and *Biological Weapons: From the Invention of State-Sponsored Programs to Contemporary Bioterrorism* (Columbia University Press, 2005). Her most recent book — *American Anthrax* (2011) — on the 2001 anthrax letter attacks in the United States, explored the subject of bioterrorism, non-state actors and criminal justice.

**Alastair Hay** is emeritus professor of environmental toxicology at the University of Leeds, where for most of his research career he has worked on biological markers of exposure to chemicals. For the last half of his career, he has been involved in setting standards for occupational exposure to chemicals for the U.K. Government and latterly for the EU. In parallel with his scientific interests, Hay has had a near 40-year involvement with chemicals weapons issues. He has conducted six investigations of allegations of use of chemical weapons in a range of countries. With a particular interest in education, Hay has worked for many years with the U.K. Royal Society, U.S. National Academy of Sciences, and the Organization for the Prohibition of Chemical Weapons to develop teaching material on chemical and biological weapons. He currently helps train academics and students to use innovative and engaging approaches to promote the responsible conduct of science. Hay was recognized for his distinguished service to science through an Order of the British Empire (OBE) award.

**Iris Hunger** works at the Federal Information Centre for Biological Threats and Special Pathogens (IBBS) of the Robert Koch Institute in Berlin, Germany. The responsibility of IBBS is to strengthen national public health preparedness and response capabilities to biological threats caused by highly pathogenic or bioterrorism-related agents. From 2006 to 2011, Hunger headed the Hamburg Research Group for Biological Arms Control at the University of Hamburg, where her work focused on bioweapons non-proliferation and arms control, security aspects of the life sciences, and the role of civil



society in preventing the (re)emergence of biological weapons. She has also held positions at the Office for Disarmament at the United Nations in Geneva and the Planning Staff of the Federal Foreign Office in Berlin. She holds an MSc in biochemistry and a PhD in international relations, and is author of *Biowaffenkontrolle in Einer Multipolaren Welt. Zur Funktion von Vertrauen in Internationalen Beziehungen* (Bioweapons control in a multipolar world: The role of trust in international relations) (2005) and coeditor of *Biopreparedness and Public Health: Exploring Synergies* (2013).

**Jo L. Husbands** is a senior project director with the Board on Life Sciences of the National Academies of Sciences, Engineering & Medicine, where she manages studies and projects related to biosecurity and dual use issues, with a specific focus on education and outreach in the broader context of responsible science and on the implications of continuing advances in the life sciences for efforts to mitigate the risks of misuse. She represents the National Academies on the Biosecurity Working Group of IAP: The Global Network of Science Academies, which also includes the academies of Australia, China, Cuba, Egypt, India, Nigeria, Pakistan, Poland, Russia and the United Kingdom. From 1991 to 2005, Husbands was director of the NAS Committee on International Security and Arms Control (CISAC) and its working group on biological weapons control. In parallel to her National Academies work, Husbands, who holds a PhD in political science from the University of Minnesota, worked as adjunct professor in the Security Studies Program at Georgetown University from 2001–2012.

**Gregory D. Koblentz** is an associate professor and director of the Biodefense Graduate Program in the School of Policy, Government & International Affairs at George Mason University. The Biodefense Graduate Program is a multidisciplinary research and education program designed to bridge the gap between the public health, life sciences and national security communities. Koblentz is also a research affiliate with the Security Studies Program at the Massachusetts Institute of Technology and a member of the Scientists Working

Group on Chemical and Biological Weapons at the Center for Arms Control and Non-Proliferation in Washington, DC. He is the author of *Living Weapons: Biological Warfare and International Security* (Cornell University Press, 2009).

**Gabriele Kraatz-Wadsack** served for 8 years as head of the Weapons of Mass Destruction Branch in the United Nations Office for Disarmament Affairs in New York (2006–2014). She served as the interim head of the BWC Implementation Support Unit in Geneva for seven months before being appointed Chief of the Regional Disarmament Branch, where she served until retirement in August 2015. Trained in veterinary medicine and microbiology, Kraatz-Wadsack served in different functions as a weapons inspector in Iraq on 26 inspection missions, including as Chief Inspector of the biological weapons inspections.

**Jens H. Kuhn** specializes in highly virulent viral pathogens and is a Principal at Tunnell Government Services (TGS) tasked as the Virology Lead at the new BSL4 lab at the Integrated Research Facility (IRF) at Fort Detrick. Kuhn was the first western scientist with permission to work in a former Soviet biological warfare facility — SRCVB “Vector” in Siberia, Russia — within the U.S. Department of Defense’s Cooperative Threat Reduction (CTR) Program. He was a member of the National Academies of Sciences’ committee on *Animal Models for Assessing Countermeasures to Bioterrorism Agents*, and is continuously involved with AAAS’s and the U.S. State Department’s bioengagement efforts in the BMENA Region, Turkey, and the NIS countries. Kuhn is also a member of the Scientists Working Group on Chemical and Biological Weapons at the Center for Arms Control and Non-Proliferation in Washington, DC. Kuhn is the author of *Filoviruses: A Compendium of 40 Years of Epidemiological, Clinical, and Laboratory Studies* (Springer, 2008) and coauthor of *The Soviet Biological Weapons Program: A History* (Harvard University Press, 2012).

**Milton Leitenberg** is a senior research scholar at the Center for International Security Studies at the University of Maryland. Originally

trained in biochemistry, Leitenberg entered the field of arms control in the late 1960s and was recruited to join the initial staff of the Stockholm International Peace Research Institute (SIPRI) in 1968. Although his primary research and writing responsibilities at SIPRI concerned nuclear weapons-related subjects, he was also one of the team, along with Julian Perry-Robinson, that produced the six-volume study *The Problem of Chemical and Biological Weapons*. He has continued to published extensively on biological weapons, including *The Problem of Biological Weapons* (Swedish National Defence College, 2004), *Assessing the Biological Weapons and Bioterrorism Threat* (U.S Army War College, 2005), and, most recently, *The Soviet Biological Weapons Program: A History* (with Raymond A. Zilinskas, Harvard University Press, 2012).

**Filippa Lentzos** is a senior research fellow in the Department of Global Health & Social Medicine at King's College London. Her work focuses on social, political and security aspects of the life sciences, and she is particularly interested in contemporary and historical understandings of the threat of biological weapons and bioterrorism. Originally trained in human sciences before obtaining her sociology doctorate, Lentzos spent the first 10 years of her career at the London School of Economics and Political Science (LSE). In 2012, she moved with her research group to King's College London to establish the Department of Global Health & Social Medicine, a unique interdisciplinary social science department aiming to provide international leadership for the social studies of health, medicine and the life sciences. Lentzos' work is theoretically driven, empirically informed and policy-relevant. It draws on a range of methods from participant observation, interviews and documentary analysis, to archival research, database searches and statistical analysis. She is committed to rigorous and responsible research that contributes to addressing the significant social, political and security challenges of developments in the life sciences. Responding to these challenges rarely involve simple, reductive or straightforward answers; and she embraces interdisciplinary perspectives and learning, as well as collaborative research, like that embodied in *Biological Threats in the 21st Century*.

**Jez Littlewood** is an assistant professor of international affairs at the Norman Paterson School of International Affairs (NPSIA), Carleton University, Canada. His research interests include proliferation and counter-proliferation of WMD, terrorism and counter-terrorism, international security and intelligence. He has written extensively on biological weapons, including *The Biological Weapons Convention: A Failed Revolution* (Ashgate Publishers 2005). He previously served as an advisor to the Counter-Proliferation Department of the U.K. Foreign and Commonwealth Office, the United Nations Department for Disarmament Affairs in Geneva, and with HM Forces (Army) of the U.K.

**Caitríona McLeish** is a senior fellow at the Science Policy Research Unit (SPRU) at the University of Sussex, and the Sussex Director of the Harvard-Sussex Program on CBW arms and arms limitation. Her research interests are focused on the dual use problem in both the chemical and biological warfare environments. This includes how dual use technologies have been exploited in past offensive and defensive programmes so as to better understand how they might be exploited in the future, and the methods and mechanisms by which different elements of the CBW governance framework try to accommodate scientific and technical change.

**Matthew Meselson** is professor in the Department of Molecular and Cellular Biology at Harvard University, which he joined in 1960. Early on in his career, he served as resident summer consultant in the U.S. Arms Control and Disarmament Agency, and has, since then, continued his interest in arms control aspects of biological and chemical weapons and in anti-CBW protection, acting as an advisor to various government agencies on the subjects. During August and September 1970, on behalf of the American Association for the Advancement of Science, he led a team to study the ecological and health effects of military use of herbicides in the Republic of Vietnam, and, upon returning to Cambridge, he and his students developed an advanced mass-spectrometric method for the analysis of the toxic herbicide contaminant TCDD and applied it to environmental and

biomedical samples from Vietnam and the U.S. In 1983, Meselson and Thomas Seeley, then at Yale, went to Thailand to conduct a field study of the so-called “yellow rain,” initially feared to be a toxic weapon but shown by Meselson and his colleagues to be non-toxic feces dropped by large swarms of the giant Asian honeybee *Apis dorsata*. More recently, in 2002 and again in 2003, Meselson led a team to Yeketerinburg (formerly Sverdlovsk), Russia to investigate an outbreak of human and animal anthrax that occurred there in 1979 and had been a subject of international dispute, conclusively demonstrating that it was caused by an airborne release of the pathogen from a closed military biological facility located in the city. In 1990, Meselson and Julian Perry Robinson established the Harvard-Sussex Program on CBW arms and arms limitation, based at the University of Sussex and at Harvard.

**Piers D. Millett** is principal of Biosecure Ltd., a company dedicated to safeguarding the bioeconomy. He currently consults for the World Health Organization supporting their R&D efforts on Ebola, and he also holds a global fellowship at the Woodrow Wilson Center for International Scholars in Washington DC, where he focuses on the implications of, and responses to, the security considerations of modern biology and biotechnology. Until June 2014, he was deputy head of the Implementation Support Unit for the Biological Weapons Convention, a treaty for which he worked for over a decade. Trained originally as a microbiologist, Millett is a Chartered Biologist and works closely with the citizen science movement, synthetic biologists, the biotechnology industry as well as governments. His efforts have seen him collaborate with a range of intergovernmental organizations spanning health (human and animal), humanitarian law, disarmament, security, border control, law enforcement, and weapons of mass destruction — both inside and out of the United Nations system.

**Julian Perry-Robinson** is emeritus professor at the University of Sussex Science Policy Research Unit, which he joined in the early 1970s. Prior to joining the Science Policy Research Unit, Perry-Robinson worked at the Stockholm International Peace Research

Institute where, along with Milton Leitenberg, he was part of the team producing the six-volume study *The Problem of Chemical and Biological Weapons*. He continued his engagement with non-governmental, intergovernmental and governmental bodies on CBW-related matters throughout his career, maintaining particularly close links with Pugwash and its specialist international study groups on CBW. In 1990, Perry Robinson and Matthew Meselson established the Harvard-Sussex Program on CBW arms and arms limitation, based at the University of Sussex and at Harvard.

**Brian Rappert** is a professor of science, technology and public affairs at the University of Exeter. His long-term interest has been the examination of the strategic management of information; particularly in the relation to armed conflict. His books include *Controlling the Weapons of War: Politics, Persuasion, and the Prohibition of Inhumanity* (Taylor and Francis, 2013); *Biotechnology, Security and the Search for Limits* (Palgrave, 2007); and *Education and Ethics in the Life Sciences* (Australian National University Press, 2011). More recently he has been interested in the social, ethical and political issues associated with researching and writing about secrets, as in his book *Experimental Secrets* (University Press of American, 2009) and *How to Look Good in a War* (Pluto Press, 2012).

Following a degree in biochemistry at Cambridge, a PhD in neurochemistry in London and post doc periods in Oxford, Rome and London, **Steven Rose** was appointed professor of biology and director of the brain and behavior research group at the Open University in 1969 at the age of 30, where he is now emeritus professor. His research centered on the neurobiology of learning and memory, on which he has published more than 300 papers and reviews. Most recently his research has been focused on developing a therapy for Alzheimer's disease. Throughout his career he has also been actively concerned with the ethical, legal and social aspects of developments in science, especially genetics and neuroscience. He was a regular panel member of Radio 4's *The Moral Maze* for 5 years, and he has written or edited 15 books including *Chemical and Biological*

Warfare (1968), *Not in Our Genes* (1984, with Richard Lewontin and Leon Kamin), *No Fire, No Thunder: Threat of Chemical and Biological Weapons* (1968, with Sean Murphy and Alastair Hay), *The Making of Memory* (science book prize 1993, new edition 2003), *Lifelines: Life beyond the Gene* (2005), *Alas Poor Darwin* (2000; with feminist sociologist Hilary Rose), and *The 21st Century Brain: Explaining Mending and Manipulating the Mind* (2005). Hilary Rose's and his most recent book *Genes, Cells and Brains: Bioscience's Promethean Promises* was published in 2012, and they are currently working on a critique of the political economy of neuroscience to be published next year. Rose has been politically active throughout his career, founding, with Hillary Rose, the British Society for Social Responsibility in Science already in 1969. In 2002, the two Roses initiated a call for a moratorium on European research collaboration with Israel whilst that country was in breach of the EU Charter of Human Rights and until a just peace was negotiated with the Palestinians. This call led to the creation of the British Committee for the Universities of Palestine. Steven Rose has received a variety of medals and international awards, and BBC4 transmitted a filmed profile of him in 2003.

**Nicholas A. Sims** holds an emeritus readership in international relations from the London School of Economics & Political Science (LSE) in the University of London. He taught in the LSE Department of International Relations from 1968 until retirement in 2010, specializing in disarmament and arms limitation treaties, verification and international organizations. He has written on the BWC ever since it was under negotiation, with particular reference to its review and reinforcement. He witnessed its entry into force in 1975, participated in its first review conference in 1980, and was an invited speaker at the 40th anniversary event held in 2015 in the Council Chamber of the Palais des Nations at Geneva in which it had been negotiated. Sims' involvement with the BWC derives from a life-long commitment to the enterprise of disarmament and a continuing interest in the interaction of science, law and diplomacy to strengthen the BWC treaty regime. His books include

*The Diplomacy of Biological Disarmament* (1988), *The Evolution of Biological Disarmament* (2001) and *The Future of Biological Disarmament* (2009).

**Alex Spelling** is a research fellow in the Science & Technology Studies Department at University College London. A Nottingham University PhD in history, his research interests lie in Cold War history from a transatlantic perspective, with special reference to the U.S.–U.K. relationship and arms control issues relating to chemical and biological weapons. He is currently working on the AHRC-funded project *Understanding Biological Disarmament: The Historical Context of the Origins of the Biological Weapons Convention* with Brian Balmer and Caitriona McLeish.

**Ralf Trapp** is an independent consultant providing technical, legal and policy advice in the fields of chemical and biological disarmament and non-proliferation. He specializes in analysing the impact of advances in science and technology on the Chemical Weapons Convention and the Biological Weapons Convention, and he provides advice on preparedness and consequence management.

**Tim Trevan** is an expert on biosecurity and health security, and on assessing and mitigating biological risks arising from nature, accidents and deliberate misuse of biology. Previously, Trevan was a British diplomat, serving in Yemen and at the United Nations Conference on Disarmament. While at the U.K. Foreign and Commonwealth Office, he dealt with weapons of mass destruction and later with the rules of war, refugees and human rights issues. He also acted as the political advisor to the United Nations Special Commission for Iraq and Trevan's book — *Saddam's Secrets* (1998) — details Iraq's weapons of mass destruction programs. Most recently, Trevan was the Executive Director of the International Council for the Life Sciences.

**Kathleen M. Vogel** is an associate professor in the Department of Political Science at North Carolina State University. She also serves as director of the Science, Technology and Society Program. Vogel



holds a PhD in biological chemistry from Princeton University. Prior to joining the NC State faculty, Vogel was an associate professor at Cornell University with a joint appointment in the Department of Science and Technology Studies and in the Judith Reppy Institute for Peace and Conflict Studies. Previously, she has been appointed as a William C. Foster Fellow in the U.S. Department of State's Office of Proliferation Threat Reduction in the Bureau of Nonproliferation. Vogel studies the production of knowledge on technical security issues. Her book *Phantom Menace or Looming Danger? A New Framework for Assessing Bioweapons Threats* (Johns Hopkins University Press, 2013) examines the social context and processes of how U.S. governmental and non-governmental analysts produce knowledge about contemporary biological weapons threats.