

A concept for international societally relevant microbiology education and microbiology knowledge promulgation in society

Executive summary: Microbes are all pervasive in their distribution and influence on the functioning and well-being of humans, life in general and the planet. Microbially-based technologies contribute hugely to the supply of important goods and services we depend upon, such as the provision of food, medicines and clean water. They also offer mechanisms and strategies to mitigate and solve a wide range of problems and crises facing humanity at all levels, including those encapsulated in the sustainable development goals (SDGs) formulated by the United Nations. For example, microbial technologies can contribute in multiple ways to decarbonisation and hence confronting global warming, provide sanitation and clean water to the billions of people lacking them, improve soil fertility and hence food production and develop vaccines and other medicines to reduce and in some cases eliminate deadly infections. They are the foundation of biotechnology, an increasingly important and growing business sector and source of employment, and the centre of the *bioeconomy*, *Green Deal*, etc. But, because microbes are largely invisible, they are not familiar to most people, so opportunities they offer to effectively prevent and solve problems are often missed by decision-makers, with the negative consequences this entrains. To correct this lack of vital knowledge, the International Microbiology Literacy Initiative—the IMiLI—is recruiting from the global microbiology community and making freely available, teaching resources for a curriculum in societally relevant microbiology that can be used at all levels of learning. Its goal is the development of a society that is literate in relevant microbiology and, as a consequence, able to take full advantage of the potential of microbes and minimise the consequences of their negative activities. In addition to teaching about microbes, almost every lesson discusses the influence they have on sustainability and the SDGs and their ability to solve pressing problems of societal inequalities. The curriculum thus teaches

about sustainability, societal needs and global citizenship. The lessons also reveal the impacts microbes and their activities have on our daily lives at the personal, family, community, national and global levels and their relevance for decisions at all levels. And, because effective, evidence-based decisions require not only relevant information but also critical and systems thinking, the resources also teach about these key generic aspects of deliberation.

The IMiLI teaching resources are learner-centric, not academic microbiology-centric and deal with the microbiology of everyday issues. These span topics as diverse as owning and caring for a companion animal, the vast range of everyday foods that are produced via microbial processes, impressive geological formations created by microbes, childhood illnesses and how they are managed and how to reduce waste and pollution. They also leverage the exceptional excitement of exploration and discovery that typifies much progress in microbiology to capture the interest, inspire and motivate educators and learners alike.

The IMiLI is establishing Regional Centres to translate the teaching resources into regional languages and adapt them to regional cultures, and to promote their use and assist educators employing them. Two of these are now operational. The Regional Centres constitute the interface between resource creators and educators—learners. As such, they will collect and analyse feedback from the end-users and transmit this to the resource creators so that teaching materials can be improved and refined, and new resources added in response to demand: educators and learners will thereby be directly involved in evolution of the teaching resources. The interactions between educators—learners and resource creators mediated by the Regional Centres will establish dynamic and synergistic relationships—a global societally relevant microbiology education ecosystem—in which creators also become learners, teaching resources are optimised and all players/stakeholders are empowered and their motivation increased.

This is an open access article under the terms of the [Creative Commons Attribution](#) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2024 The Authors. *Microbial Biotechnology* published by Applied Microbiology International and John Wiley & Sons Ltd.