Technology Transfer for Molecular Biological Tools (MBTs) and their Role in Stakeholder Communications

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Background/Objectives. From metagenomics through transcriptomics to proteomics and metabolomics, the advances in molecular biological tools (MBTs) over the past 30 years have been truly astounding. DNA and RNA extractions on environmental samples are now commonplace and qPCR is a routine component of site management. qPCR has given rise to QuantArrays, advances in next generation DNA sequencing technologies seem nearly continuous, and widespread environmental proteomics may be just over the horizon. Shifting these advances from the laboratory bench to applications in the field required effective technology transfer. The presentation will discuss critical changes in traditional academia/industry and licensor/licensee relationships, effective communication in technology transfer, and the importance of MBTs to environmental remediation stakeholders.

Approach/Activities. Microbial Insights (MI) was established in 1992 as a technology transfer company based on the pioneering research of Dr. David White. Over the past 25 years, MI has performed every phase of technology transfer – internal research and product development, commercialization of licensed technologies from universities and government agencies, and for both internal and external development routes, technical communications directed toward reaching end-users (e.g., consultants) and stakeholders (e.g., responsible parties, site owners, etc.). During this period, the concept of and metrics for technology transfer have evolved. Moreover, with wikis, webinars, and social media joining the traditional avenues (workshops, exhibits, etc.), implementation of technology transfer has also changed dramatically. A literature review of technology transfer principles and metrics was conducted and combined with MI's experiences in the technology transfer arena over the past 25 years to identify lessons learned, major changes in the practice, and opportunities for improvement.

Results/Lessons Learned. A conceptual shift in the relationship between academia and industry and licensors and licensees in general has occurred in recent years. The traditional view had been that innovation, proof-of-concept, and validation began and ended in academia. Technology transfer and licenses were addressed at the end or in some instances as an afterthought following fundamental research. Industry partners are immersed in the marketplace, know the end-user and stakeholders needs, and provide invaluable feedback ensuring development of useful and commercially viable technologies. Moreover, industry, with real world samples, conditions, and experience is the ultimate proving ground and no technology should be considered fully vetted until it has been put through its paces by an industry partner. Thus, the mindset has changed to place more value on input from industry partners throughout the process and foster true collaborations. Challenges remain however. With respect to technology transfer communications to end-users and stakeholders, innovators must take advantage of all venues, traditional and emerging, to ensure comprehensive communication. In addition, the message must be tailored to the audience because although their goals overlap, the main concerns of end-users and other stakeholders are often different. In environmental remediation, communication to other stakeholders (responsible parties, site owners, concerned citizens, etc.) is often indirect and performed by end-users (e.g., consultants). For MBTs, therefore, the end-users must recognize the advantages and limitations of each technology, correctly interpret and integrate those results with traditional site data, and be able to relate those findings to the other stakeholders. Overall, great strides have been made, but continued and concerted efforts by academia, industry, funding agencies, consultants and regulators will be needed to bring the next wave of MBTs from the laboratory to beneficial applications in the field.