

Fostering Transdisciplinary Science

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The causes and prevention of cancer in humans are complex phenomena, and thereby require the application of scientific methods to address this inherent complexity. It is a common axiom that researchers from multiple disciplines may be required to address the complex etiology and prevention of human disease. There are, however, a number of ways that a group of researchers may bring their individual areas of expertise to address a common research problem (1): multidisciplinary approaches involve scientists from different disciplines who work in parallel or sequentially; interdisciplinary approaches involve researchers working together and transferring knowledge between disciplines, but use methods specific to each of their research disciplines; transdisciplinary approaches involve the development of a common research framework and methodology to integrate and transcend their individual disciplines. Science has typically advanced using multidisciplinary approaches. More recently, interdisciplinary approaches have resulted in hybrid disciplines such as “bioinformatics” or “molecular epidemiology.” However, the development of transdisciplinary approaches has been more difficult to achieve.

Even the definition of transdisciplinary science has been much debated. These definitions include concepts of transdisciplinarity as a “hyperdiscipline” that involves “the coordination of multiple disciplines... on the basis of a general axiomatic approach” (2); “a means of creating a homogeneity in the theoretical activity in different sciences and techniques, independently of the field where this activity is effectuated” (3); and definitions that define transdisciplinarity as going “beyond disciplines” (4). On a practical level, a number of research teams have begun to build structures for transdisciplinary approaches in cancer, including that of the Translational Tobacco Use Research Centers (5), The Centers for Population Health and Health Disparities (6), and the Centers for Excellence in Cancer Communications Research, among others.

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These approaches face communication and conceptual barriers brought on by disparate research backgrounds and scientific methods of the individual researchers. Successful transdisciplinary research is therefore difficult to achieve and requires a team science approach (7, 8). Despite the challenges that face a transdisciplinary approach, the potential for this kind of research to advance our understanding of cancer etiology and prevention argue that mounting these efforts could provide substantial payoffs.

Among the challenges for transdisciplinary research is where to publish articles that are not traditionally based on a single discipline or methodology. Teams of scientists involved in transdisciplinary research are likely to value different journals for the publication of their best work. Editors may not be able to see transdisciplinary science as falling within the scope of their journals. To encourage transdisciplinary cancer research and to provide a home for research that does not fall neatly into one discipline, *Cancer Epidemiology, Biomarkers & Prevention (CEBP)* encourages the submission of research that involves transdisciplinary approaches to address questions of cancer etiology, prevention, control, survivorship, and outcomes. These articles may incorporate a new shared language, pooled bodies of knowledge and theory, and jointly developed new methods. For example, transdisciplinary cancer research may address the biological, environmental, behavioral, and social determinants of cancer risk or outcome and use novel methods drawn from molecular biology, genetic epidemiology, sociology, economics, psychology, biomedical informatics, and health policy. Ideally, transdisciplinary research will have implications for clinical and public health practice, with potential to catalyze critical improvements in the prevention and treatment of cancer.

Since its inception, *CEBP* has been dedicated to the publication of research that crosses disciplines and integrates knowledge across fields. To encourage this kind of research, *CEBP* welcomes transdisciplinary research submissions, and will highlight accepted articles with a “Transdisciplinary Science” heading in the journal.

Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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