

# Transdisciplinary Science and Translational Prevention Program



Genetics, biology, and the social and physical environment all influence a person's ability to function physically, socially, and psychologically. How these factors combine to interact with one another can affect an individual's behavior and response to preventive and treatment interventions. Individual differences in these factors contribute to differences in behavioral outcomes and the ability to benefit from standard interventions. RTI International's Transdisciplinary Science and Translational Prevention Program seeks to identify the mechanisms underlying both behavioral problems and intervention intractability. Ultimately, this research will inform prevention practice and policy, resulting in significant cost savings and improved quality of life.

## Program Overview

The Transdisciplinary Science and Translational Prevention Program is a signature program in RTI's Molecular Epidemiology, Genetics, Environment, and Health (MEGEH) Unit. Researchers are working to identify the underlying factors associated with behavioral disorders using a model designed to transfer knowledge about developmental mechanisms from basic science to practical applications in prevention and public health. This model explores pathways in which the environment, genes, gene expressions, and biological or psychological differences exert influences to alter behavior throughout development.

Findings will support the design of more effective interventions, enabling researchers to answer the following questions: "What works best for whom, why, and under what circumstances?" Development, implementation, and refinement of these interventions in different populations and settings will result in a return to the basic sciences, or backward translation, allowing for further investigation of poor therapeutic outcomes for subgroups or individuals. Feedback loops, which are intrinsic to the model, will

incorporate what is learned about successes and failures at each stage. Ultimately, strategies will address conditions that underlie the amenability of individuals or subgroups to conventional approaches, leading to improvements in intervention efficacy and effectiveness. Through a transfer of knowledge from science to practice, public health strategies and policies will become increasingly responsive and exert a broader impact.

## Research Expertise

Any study of complex human behavior must take into account the big picture, while also considering interrelationships between components of and changes in the system over time. For this reason, research that employs a "systems" approach—combining a transdisciplinary perspective with multilevel analyses and the translation of basic science to practical application—is ideal. But it also requires communication and integration among many disciplines, from genetics and socio-environmental sciences to the behavioral sciences and, finally, public policy.

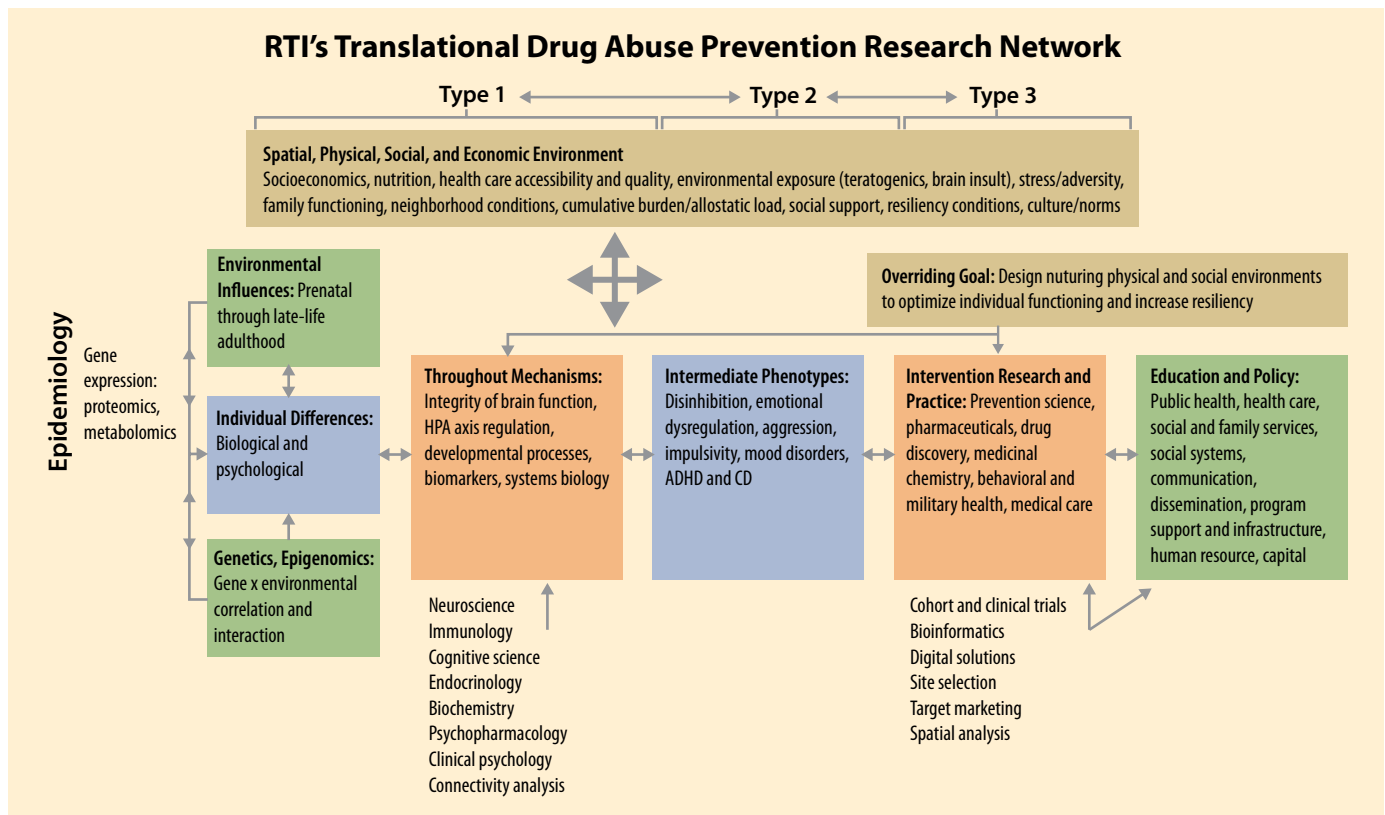


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At RTI, each of the relevant disciplines with potential to inform this line of study is represented, as shown in the figure below. The Transdisciplinary Science and Translational Prevention Program connects RTI investigators who are conducting relevant work at various points along this translational pathway, capitalizing on existing capabilities and resources. By mapping the model's framework to various RTI projects currently engaged in this work, it is possible to assess the depth and breadth of RTI's capabilities in each

domain. Potential for collaborative work within RTI can then be characterized where overlap or adjacencies occur, and possibilities for joint research can be explored.

RTI's investment in research that has such broad applicability for individuals, neighborhoods, health care providers, community leaders, educators, and regional policy makers will ultimately generate extraordinary savings in cost as well as improvements in the quality of life for many people.



**Type 1 translation:** Applies basic science discoveries to the development and preliminary testing of interventions  
**Type 2 translation:** Enhances the adoption, implementation, and sustainability of evidence-based or scientifically validated interventions by service system  
**Type 3 translation:** Reliably delivers science-based interventions to all recipients in all settings

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