

## *Training 21<sup>st</sup>-Century Physicians and Scientists in Team Science*

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Academic medicine operates in a constantly evolving environment. These evolutions are evidenced by health care reform, complex scientific and social challenges, decreased federal research funding, shifting faculty demographics, and the emergence of disruptive innovations in medicine, science, and education. Each change contributes to a constantly evolving and consistently challenging milieu. Despite remarkable advances in medical research, clinicians and scientists face overwhelming challenges such as the opioid epidemic, variation in patient response to intervention, and an increase in chronic disease.

The gap between biomedical research and unmet clinical needs can be addressed by highly talented physician-scientists comfortable with participating in multidisciplinary teams that address complex health problems. 21<sup>st</sup> century physicians and scientists need to be trained in a broad, nonlinear, cross-disciplinary manner to become essential members of science teams in the new age of precision medicine. Further, progress in the biomedical sciences is dependent on the ability of researchers to engage more effectively in translational and interdisciplinary initiatives,

involving teams of physicians and scientists from diverse disciplines and backgrounds.<sup>1,2</sup> Team science approaches have accomplished biomedical breakthroughs once considered impossible; dedicated physician-scientists have been critical to these achievements. This shift in approach is also motivated by the National Institutes of Health (NIH) Roadmap Initiative<sup>3</sup>, which seeks to promote more rapid translation of basic knowledge to effective health care and improved population health as a path for the future.

Although effective teamwork is identified as a requirement for enhanced clinical outcomes in the provision of healthcare and healthcare research, the current system does not appropriately train either physicians or scientists for these endeavors. While there is inadequate knowledge about what makes health professionals effective team members, there is even less information on how to develop skills for interdisciplinary teamwork. In academic medicine, teamwork skills are largely learned on the job. There is limited opportunity for formal training in teamwork skill development in undergraduate or postgraduate



health professional education programs. Training in this capacity consists primarily of discipline-based education with an emphasis on contributing to disciplinary methods and knowledge. Active educational and training programs that focus on the dynamics of team science may lead to greater success as gauged by both group and individual productivity.

Learning and growing novel skill sets in team science is developmental and progressive in nature<sup>4</sup>. Therefore, the institution's infrastructure to provide ongoing opportunities for such training and growth must be established at multiple levels. The communication and self-knowledge skills needed for effective teamwork can be learned by physicians and scientists of all ages and at every career stage and, together, can translate into pillars of academic growth. Individuals across disciplines working together strategically toward shared goals is what 21<sup>st</sup> century healthcare demands and deserves.

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