



Dr. Ipsita Banerjee Receives NSF Grant

McGowan Institute for Regenerative Medicine affiliated faculty member [Ipsita Banerjee, PhD](#), Assistant Professor in the Department of Chemical and Petroleum Engineering at the University of Pittsburgh, has been awarded a National Science Foundation (NSF) Early-Concept Grants for Exploratory Research (EAGER) grant entitled: "Systems Analysis of Signaling Pathway towards Robust Differentiation." This award is for 1 year at \$100,000.



The topic of Dr. Banerjee's EAGER proposal is to develop a quantitative and predictive representation of a critical signal transduction pathway driving stem cell differentiation. The rationale for the proposed work is that once it is known how a signal is transduced and uncertainty is propagated during differentiation, it will be possible to design targeted interventions to achieve homogenous and efficient differentiation. The proposed approach seeks to shift the way stem cell differentiation is studied to date, by adopting an integrated multi-level approach connecting single-cell level experiments with cell population dynamics through a quantitative modeling approach utilizing systems analysis tools. The predictive platform to be developed in this project will inform the design of targeted interventions for efficient and homogenous differentiation of stem cells, thereby bringing stem cells a step closer to realizing their transformative potential. The aforementioned platform will allow all stem cell researchers to perform in-silico trial experiments before designing wet lab experiments, thereby expediting discovery of novel protocols for stem cell differentiation.

All NSF programs encourage and support potentially transformative research proposals. One special mechanism is the EAGER program, a funding mechanism that can be used to support exploratory work in its early stages on untested but potentially transformative research ideas or approaches. This work could be considered especially "high risk/high payoff" in the sense that it involves radically different approaches, applies new expertise, or engages novel disciplinary or interdisciplinary perspectives.

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