

DEVELOPING IMPROVED METHODS TO MEASURE HUMAN DNA REPAIR CAPACITY

Leona D. Samson, Department of Biological Engineering, Department of Biology, Center for Environmental Health Sciences, Koch Institute for Integrative Cancer Research, Massachusetts Institute of Technology, Cambridge, MA 02139

During the last two years the Samson lab has been developing potentially high-throughput methods for measuring DNA repair capacity (DRC) in human cells. These approaches are modeled on the pioneering work of the late Professor Lawrence Grossman and rely on the transfection of plasmids containing specific types of DNA damage and then monitoring the repair of that damage by the expression of a reporter gene that is poorly expressed in the absence of repair. One of our goals is to simultaneously measure DRC for a variety of DNA repair pathways using a multiplexed approach and a collection of fluorescent proteins of different color. I will give a progress report on these developments and outline our future plans for achieving this goal and for extending this approach using deep sequencing. Measuring DNA repair capacity in various human cell types may help predict inter-individual differences in the ability of people to respond upon exposure to endogenous and exogenous environmental agents.