

NEWS RELEASE

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NC State Chemical Engineer Models Molecular Pathways that Govern Cell Responses Related to Wound Healing and Cancer

FOR IMMEDIATE RELEASE

A North Carolina State University chemical engineer is working with researchers from 23 institutions in a collaborative effort to understand cell migration. The Cell Migration Consortium, funded through a “glue” grant from the National Institutes of Health (NIH), was formed to study the molecular basis for cell movement, a process that is key to understanding cancer progression and tissue regeneration.

The 40-member team of researchers has recently received a \$35.7 million grant renewal from the NIH to continue this work. The team is organized into multidisciplinary working groups – called initiatives – that investigate the different aspects of cell migration and is in the process of developing new biological tools, chemicals, technologies and data to improve understanding of how and why cells move.

Dr. Jason Haugh, associate professor of chemical and biomolecular engineering at NC State, is working with the modeling initiative. This group is developing mathematical descriptions of the chemical and mechanical processes that govern cell migration, in close collaboration with biologists within and outside the consortium. Other groups include the discovery initiative, which is identifying the functions of major genes and proteins involved in cell migration, and the structure initiative, which studies how adhesion proteins assemble to form biologically active, multiprotein machines.

Haugh’s role in the consortium is to model intracellular signaling elicited by combinations of distinct cell migration stimuli, driven in part by experiments in his laboratory. Simply put, he is modeling how a cell responds to changes in its environment. He has already characterized and modeled the cellular response stimulated by platelet-derived growth factor (PDGF) and other factors released during wound healing.

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Using real-time imaging of fluorescent probes in living cells, Haugh can directly compare the observed patterns of signaling within the cells to the models he has developed. This approach allows Haugh to study how signaling mechanisms are regulated and organized in response to a variety of cell migration cues.

Haugh's research combined with the other research projects conducted within the consortium will greatly improve the understanding of cell migration and provide other scientists with new tools for studying the cell migration process.

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