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## ***In Situ* Visualization of Skin-Associated Dendritic Cell Behaviors**

The epidermis serves as a physical barrier and the first line of defense against a variety of environmental insults, also functions as an immunological barrier by producing cytokines, antimicrobial peptides, and other mediators, and by hosting resident leukocytes, known as Langerhans cells (LCs). LCs represent an immature subset of the dendritic cell (DC) family of antigen presenting cells. Immature LCs maintain peripheral immune tolerance against self-antigens and innocuous environmental antigens. Upon sensing signals under pathological conditions, however, they differentiate into fully mature DCs capable of initiating T cell-mediated protective immunity against potentially harmful antigens. The allergic contact hypersensitivity response (CHR) to reactive haptens has long been used as a standard model for studying the process of LC maturation and immunostimulatory function of mature LCs. This however, fails to explain the most recent findings that LCs are incapable of presenting microbial antigens to T cells directly and that allergic CHR is inducible even in the complete absence of epidermal LC networks. In other words, functional contributions of LCs to adaptive immunity still remain somewhat controversial and more study is necessary. Therefore, novel imaging system that enables direct visualization of the dynamic process for macromolecule endocytosis by LCs in normal living animals has been developed.

The University of Toledo is seeking a company interested in utilizing this non-invasive, intravital imaging system to visualize the number, morphology, location, and/or motility of skin-associated dendritic cells.

### **Applications:**

1. Identification of and monitoring of the cellular functions of Langerhans cells and/or dendritic cells in the skin
2. Diagnostic purposes and *In vivo* screening of drug candidates for their efficacy to control LC and DC functions

### **Advantages:**

1. Non-invasive, intravital imaging
2. Real-time evaluation and monitoring
3. Does not require construction of genetically engineered animals

**This invention is patent pending**

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