

## Soft Electronic and Microfluidic Systems for the Skin

John A. Rogers<sup>\*,1</sup>

<sup>1</sup>Department of Materials Science and Engineering, Biomedical Engineering and Neurological Surgery,  
Northwestern University, Evanston, USA

\*Corresponding author (Tel: +1-847-467-2997; E-mail: jrogers@northwestern.edu)

### Abstract

Recent advances in materials, mechanics and manufacturing establish the foundations for high performance classes of electronic and microfluidic technologies that have physical properties precisely matched to those of the human epidermis. The resulting devices can integrate with the skin in a physically imperceptible fashion, to provide continuous, clinical-quality information on physiological status. This talk summarizes the key ideas and presents specific examples in wireless monitoring for neonatal intensive care, and in capture, storage and biomarker analysis of sweat. Figure 1 shows images corresponding to these two examples[1,2].

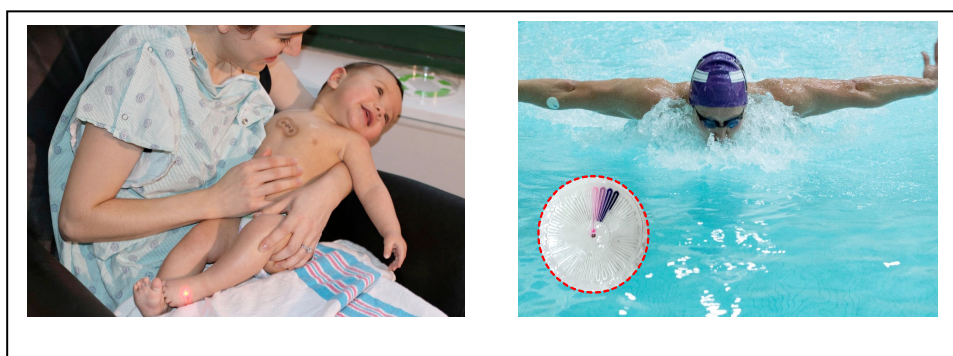


Fig. 1. Epidermal electronics for wireless, battery-free vital signs monitoring in the pediatric intensive care unit (left) and skin-interfaced microfluidic systems for capture and chemical analysis of sweat in athletic events (right).

**Keywords:** (flexible electronics, bio-integrated devices, wearable technology)

### References

- [1] Chung, H.U. et al, Science, 363, 6430, eaau0780 (2019).
- [2] Reeder, J. et al, Science Advances, 5: eaau6356 (2019).