MBG FOCUS TALK

hosted by Erik Østergaard Jensen

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Dept. of Matematics, 1532-122 (G2)

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Regulatory RNAs in the skin: roles in cancer and innate immunity

Non-coding RNAs have important regulatory functions in virtually all biological processes. Interestingly, many non-coding RNAs display altered levels in disease states such as cancer and inflammation. We study the role of non-coding RNAs (miRNAs and long non-coding RNAs) in the skin, mainly focusing on two topics: 1) their role in the most common human malignancy, skin cancer and 2) their role in regulating the innate immune response of skin epithelium.

We have investigated the role of non-coding RNAs in the malignant transformation and during the innate immune response of skin epithelial cells, keratinocytes, and investigated their functions systematically using in vitro and in vivo disease models. Our research has identified important roles for miRNAs in the regulation of basic molecular and immunological processes of the skin epithelium. We have identified a skin miRNA, miR-203, which regulate the self-renewal capacity, differentiation and chemokine-secretion of keratinocytes, and acts as a tumor suppressor. Furthermore, we identified a set of miRNAs regulated by one of the most important family of innate sensors of pathogen and stress, Toll-like receptors. Our work has revealed important roles for TLR2-regulated miR-146a in setting the threshold of sensitivity of keratinocytes towards innate stimuli by the regulation of the TLR2-NF-kB-chemokine pathway both under physiological and inflammatory conditions.

These findings highlight important roles for miRNAs in skin physiology. Our long-term goal is to translate these findings into the clinical practice and modulate miRNA expression in the skin via synthetic miRNAs or miRNA inhibitors.