A Novel Method for Detecting Activation of Necroptosis via Exosome Analysis (Yeda)

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Summary

Numerous medical conditions are related to inflammation, such as pancreatitis, psoriasis, inflammatory bowel disease, atherosclerosis, neurodegeneration, and more. However, determination of inflammation in the body, especially at early stages of a pathology is difficult to assess. Therefore, there is a great clinical need for diagnostic tools to gauge inflammation. The team of Prof. David Wallach have discovered novel biomarkers in exosomes related to necroptosis, a form of programmed cell death that induces inflammation. Using these biomarkers in exosomes different diagnostic tests can be developed for an array of inflammatory conditions.

Applications

? **Diagnostics for inflammation**? **Specificity in terms of tissue affected when combined with other biomarkers**

Technology's Essence

Cell-derived vesicles termed exosomes are commonly found in bodily fluids such as blood and urine. Consequently, by examining these exosomes it is feasible to discover different biomarkers for the state of health in the human body. The Wallach team discovered that when the kinase RIPK3 is activated, a known inducer of inflammation and necroptosis, it also phosphorylates mixed lineage kinase domain like pseudokinase (MLKL) as one of its targets. Phosphorylated MLKL was then shown to increase exosome production, which led to a greater release of phosphorylated MLKL in said exosomes. Therefore using in vitro work the Wallach team was able to show that screening exosomes for phosphorylated MLKL represents a potential diagnostic for inflammation.

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