세미나 초록

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발표 주제	**Posttranscriptional regulation in stem cell fate**
발표 내용	The interplay of RNA-binding proteins in determining stem cell destiny represents a frontier in cellular biology. In this realm, UPF1 and LIN28A emerge as critical regulators of post-transcriptional pathways, guiding the outcome of stem cell differentiation. Previous investigations have predominantly delineated the individual roles of UPF1 in differentiated cells and LIN28A in stem cell differentiation. Here, we illuminate a novel interaction wherein LIN28A binds directly to UPF1 prior to the formation of the UPF1-UPF2 complex. This association curtails UPF1 phosphorylation and consequently attenuates nonsense-mediated mRNA decay (NMD). We have pinpointed the domains responsible for the UPF1-LIN28A interaction and have engineered a peptide that disrupts this interaction, enhancing NMD efficiency. Through transcriptomic profiling of human pluripotent stem cells (hPSCs), we established that UPF1 and LIN28A significantly modulate the abundance of NMD-sensitive transcripts. Disruption of UPF1-LIN28A binding via a cell-penetrating peptide (CPP) conjugate facilitated spontaneous differentiation, concomitantly diminishing hPSC pluripotency during cell proliferation. Notably, the UPF1-LIN28A complex exhibited selective governance over transcripts implicated in ectodermal lineage commitment. Our findings delineate a pivotal role for the UPF1-LIN28A interplay in steering the transcriptomic landscape of hPSCs, thereby dictating their developmental trajectory.