CODING AND NON-CODING RNA IN DORMANT CELLS

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Specific signals can interrupt relentless cell proliferation by inducing quiescence, a dormant cell state characterized by a reversible exit from cell cycle that can be sustained over long periods of time. Whereas quiescence is likely to have emerged early in evolution to facilitate survival of micro-organisms during periods of limitation, it has since then spread widely in phylogeny to suit specialized purposes in diverse biological contexts. Indeed, quiescence is known to play essential roles in tissue differentiation, resistance to stress, aging, and longevity of organisms, while its disruptions underlie cancer. However, understanding quiescence is limited by lack of efficient, broad-spectrum inducing conditions. In this lecture, I will discuss our recent finding that rapid depletion of two highly conserved ribozymes, RNases P and MRP, induces a dormant, quasi-quiescent state in commonly studied mammalian cells in culture. I will focus on altered processing of the most abundant coding and non-coding RNA species and how this may contribute to the induction and reversibility of cell dormancy.