Lamin A and PI(4,5)P2 - a novel complex in the cell nucleus

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Lamins are important regulators of nuclear structural integrity as well as nuclear functional processes such as DNA transcription, replication and repair, and epigenetic regulation. Mutations in LMNA gene, which encodes for lamin A protein, cause a large variety of human diseases, known as laminopathies, including muscular dystrophies and progeroid syndromes. Phosphatidynositol-4,5-bisphosphate (PIP2) is a well described product of the phosphoinositol signalling and it has an important role in splicing and transcription. Here we show that PIP2 is in a complex with lamin A, together with Nuclear myosin 1 (NM1), and lamin A phosphorylation status appears to be implicated in the anchoring of other proteins to the complex, as well as in the movement of lamin A from the nuclear envelope to the nucleoplasm. Thus, we are characterizing this complex using several biochemical and microscopy methods. From our preliminary data we conclude that some Lamin A phosphorylation sites might be important for PIP2-dependent interactions of lamin A, important for nuclear functions.

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