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Neuroanatomy as a guide to understand disease spreading

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The classic region-specific characterization of various neurodegenerative disorders and acute neurological insults has been challenged by recent studies showing multiple brain areas and peripheral sites in addition to those specifically described as disease-specific. In this presentation we will shortly overview the multiple brain regions, whichh according to various time-dependent progression are recruited in specific neurodegenerative disorders. Detailed anatomical studies analyzing the fine connections of specific brain areas are key to understand site-specificity of disease spreading. Molecular mechanisms involving disease-specific different misfolded proteins help to explain the variety of these disorders at disease onset, while similar cell-to-cell protein spreading helps to understand why the neuroanatomical pattern of each disease partly overlaps at the end stages. Experimental evidence from our lab will be reported to study cell-to-cell spreading of misfolded protein working as the molecular engine which fosters disease progression along well defined anatomical connections. Biochemical properties of specific misfolded proteins will be compared in order to understand the severity of disease course along various anatomical areas.

Keywords

Misfolded proteins, cell-to-cell communication, disease spreading, clinical neuroanatomy, prionoids.