	GL leader	**Assoc. Prof. Jozef Hritz, PhD**
1	**CEIPEX RESEARCH TOPIC LEVEL2**	**Structural Biology: protein structure and dynamics; protein-DNA interactions**
2	**RESEARCH GROUP**	**Protein Structure and Dynamics**
3	**TOPICS/FOCUS**	Structural Changes in Intrinsically Disordered Proteins Relevant to Neurodegenerative Diseases
4	**SUMMARY**	Our research is centered on intrinsically disordered proteins (IDPs) such as Tau and α-Synuclein, which are known to undergo conformational changes that result in the formation of pathological fibrils. These fibrillar aggregates are hallmark components of neurofibrillary tangles in Alzheimer's disease and Lewy bodies in Parkinson's disease. We investigate, in detail, how post-translational modifications, buffer conditions, and interactions with binding partners—particularly 14-3-3 proteins—influence these structural transitions. For the characterization of soluble protein states, we employ biomolecular NMR spectroscopy (CF NMR CEITEC - Ceitec.cz). Structural studies of fibrillar forms are conducted using atomic force microscopy (AFM) and cryo-electron microscopy (cryo-EM). Importantly, beyond in vitro models, we analyze patient-derived pathological fibrils directly within tissue samples from Alzheimer's and Parkinson's disease patients using cryo-EM tomography (CF Cryo-Electron Microscopy and Tomography - Ceitec.cz). To gain deeper mechanistic insights, we integrate experimental data with computational simulations. Our work is supported by multiple international research grants, most notably the *Excellence Hubs* project ADDIT-CE, coordinated by Jozef Hritz (ADDIT-CE - Ceitec.cz).
5	**RG WEBPAGE/CONTACT**	https://www.ceitec.eu/protein-structure-and-dynamics/rg110