	GL leader	**Karel Říha, PhD**
1	**CEIPEX RESEARCH TOPIC LEVEL2**	**Genomics & Proteomics of Plant Systems: stress in plant system**
2	**RESEARCH GROUP**	Plant Molecular Biology
3	**TOPICS/FOCUS**	**Molecular mechanisms of heat stress adaptation: The function of ribonucleoprotein condensates in plant reproduction**
4	**SUMMARY**	Elevated temperatures pose a major challenge to plant reproduction, threatening crop fertility and yield. Meiosis is particularly vulnerable to heat stress, which can disrupt homologous recombination and chromosome segregation, leading to pollen abortion and infertility. To cope with these conditions, plants employ intricate molecular mechanisms that safeguard gene expression and protein function. Among these, ribonucleoprotein (RNP) condensates have emerged as dynamic regulatory hubs that respond to diverse stress conditions by sequestering and protecting RNAs and proteins, thereby fine-tuning gene expression for adaptation. We have recently identified an RNA-binding protein that forms RNP condensates, which act as key regulators of meiotic protein expression, influencing processes such as chromosome pairing, cytokinesis, and callose metabolism. Importantly, these condensates are responsive to temperature, suggesting a critical role in plant adaptation to heat stress. The main goal of this project is to elucidate how these RNP condensates coordinate stress responses and contribute to heat stress adaptation. Ultimately, this knowledge will be leveraged to manipulate these mechanisms to enhance plant reproductive resilience and seed yield under elevated temperatures.
5	**RG WEBPAGE/CONTACT**	https://riha.ceitec.cz/