Postdoc position in Mass Spectrometry and Proteomics of chloroplasts proteostasis

Lab of Klaas van Wijk, Section of Plant Biology, School of Integrative Plant Sciences (SIPS), Cornell University, Ithaca, NY, USA

The van Wijk lab has a 20+ history in plant proteomics and mass spectrometry to study biological questions in Arabidopsis and other plants species. The van Wijk lab has an in-house mass spectrometer (QExactive), an extensive bioinformatics proteomics processing 'pipe-line' and houses the Plant Proteome Data Base (PPDB). Together with colleagues in the Systems Biology Institute (ISB) in Seattle we are also funded by the National Science Foundation to build an Arabidopsis PeptideAtlas by reprocessing millions of publicly available mass spectrometry data. The postdoc will be part of a team to study chloroplast proteolysis in Arabidopsis thaliana, including protease substrate selection mechanisms, protease structure-function analysis, and quantitative proteomics of single and higher order chloroplast protease mutants. The Postdoc will also contribute to truly large-scale plant proteomics & mass spectrometry data analysis in collaboration with the ISB. The van Wijk lab is funded through awards from the National Science Foundation. This postdoc position provides an excellent training opportunity in plant protein biochemistry and mass spectrometry, chloroplast proteostasis, plant systems biology and bioinformatics. The position is initially a one year full-time appointment, but renewable for additional years, contingent upon performance. Salary is competitive and commensurate with background and experience. An attractive fringe benefits package is provided.

Qualifications: The applicant must have a PhD degree and a strong background in large scale proteomics and mass spectrometry (ESI-MSMS), as is evidenced by several publications in International Journals. Training in Plant Biology would be highly beneficial.

Application Instructions: Submit a letter summarizing your background and qualifications, a statement of research accomplishments and interests (3 pages maximum), a detailed curriculum vitae, and the names of three references by email to kv35@cornell.edu. Klaas J. van Wijk, Professor and Chair, Section of Plant Biology, School of Integrative Plant Sciences (SIPS), Cornell University, Ithaca, NY 14853, USA. For more about the van Wijk lab http://blogs.cornell.edu/vanwijk/. Review of applications will begin immediately and will continue until the position is filled.

Recent relevant publications from the van Wijk Lab: Bhuiyan et al (**2020**) Auto-catalytic processing and substrate specificity of Arabidopsis chloroplast glutamyl peptidase. *Plant Physiology*; Montandon et al (**2019**) In vivo trapping of candidate protease substrates and adaptors of the chloroplast CLPC1 chaperone. *Journal Proteome Research*; Liao & van Wijk (**2019**) Discovery of AAA+ protease substrates through trapping approaches. *Trends in Biochemical Sciences;* Majsec et al (**2017**) The Plastid and Mitochondrial Peptidase Network in Arabidopsis thaliana: A Foundation for Testing Genetic Interactions and Functions in Organellar Proteostasis. *The Plant Cell*; Bhuiyan et al (**2016**) Plastoglobule localized metallopeptidase PGM48 is a positive regulator of senescence in Arabidopsis thaliana. *The Plant Cell;* Lohscheider et al (**2016**) Phosphorylation of plastoglobular proteins in Arabidopsis thaliana. *J. Exp Botany*; Rowland et al (**2015**) The Arabidopsis Chloroplast stromal N-terminome; complexities of N-terminal protein maturation and stability. *Plant Physiology*; Friso & van Wijk (**2015**) Update: Post-translational protein modifications in Plant Metabolism. *Plant Physiology*

Postdoc position in Arabidopsis Molecular Genetics and Biochemistry to study chloroplast proteolysis

Lab of Klaas van Wijk, Section of Plant Biology, School of Integrative Plant Sciences (SIPS), Cornell University, Ithaca, NY, USA

Chloroplast protein homeostasis (proteostasis) through coordinated action of proteolytic systems in chloroplasts. Chloroplasts contain several thousand different proteins, some with a high number of copies (e.g. Rubisco) and other with very low copy number. Some proteins have a very short half-life of just ~30 min, whereas others are stable for several days. Chloroplasts contain many different protease systems encoded by ~100 genes. Research in the van Wijk lab aims to determine what controls the stability of chloroplast proteins. We are particularly interested to determine the signals/information within proteins that are recognized by different proteases; such signals are called degrons and hold the key to understanding proteolysis. We mainly use Arabidopsis as our experimental system and a variety of proteomics and mass spectrometry techniques (e.g. TAILS) are used to track, identify and quantify N-terminal maturation, proteolytic cleavage events and accumulation of protein degradation products. In planta substrate trapping and affinity enrichment further help to identify substrates and discover protein-protein interactions, e.g. resulting recently in our discovery of a new adaptor ClpF. This project is funded by the National Science Foundation.

This postdoc will use Arabidopsis molecular genetics and biochemical tools to determine the function of several candidate Clp adaptor proteins that are postulated to select specific chloroplast for delivery to the Clp protease system for degradation. The underlying biochemical mechanisms for observed genetic interactions between different chloroplast protease system will also be studied. Salary is competitive and commensurate with background and experience. An attractive fringe benefits package is provided.

Qualifications: The applicant must have a PhD degree and a strong background in Arabidopsis molecular biology and protein biochemistry as is evidenced by several publications in International Journals. Experience in chloroplast research would be highly beneficial.

Application Instructions: Submit a letter summarizing your background and qualifications, a statement of research accomplishments and interests (3 pages maximum), a detailed curriculum vitae, and the names of three references by email to kv35@cornell.edu. Klaas J. van Wijk, Professor and Chair, Section of Plant Biology, School of Integrative Plant Sciences (SIPS), Cornell University, Ithaca, NY 14853, USA. For more about the van Wijk lab http://blogs.cornell.edu/vanwijk/. Review of applications will begin immediately and will continue until the position is filled.

Recent relevant publications from the van Wijk Lab: 1. Bhyuian et al (2020) Auto-catalytic processing and substrate specificity of Arabidopsis chloroplast glutamyl peptidase. Plant Physiology; **2.** Bouchnak et al (2019) N-degron pathways in plastids. Trends in Plant Sciences; **3.** Montandon et al (2019) In vivo trapping of candidate protease substrates and adaptors of the chloroplast CLPC1 chaperone. Journal Proteome Research; **4.** Montandon et al (2019) N-Degron Specificity of Chloroplast ClpS1 in Plants. FEBS Lett.; **5.** Liao & van Wijk (2019) Discovery of AAA+ protease substrates through trapping approaches. Trends in Biochemical Sciences; **6.** Majsec et al (2017) The Plastid and Mitochondrial Peptidase Network in Arabidopsis thaliana: A Foundation for Testing Genetic Interactions and Functions in Organellar Proteostasis. The Plant Cell.