

Internship opportunity – Studying endogenous proteolysis in hemostasis using peptidomics

Hemostasis is a finely regulated process involving a cascade of proteolytic events, ultimately resulting in the formation and resolution of blood clots. Endogenous peptides generated through controlled protease activity reflect the dynamic state of this system and may serve as functional biomarkers of coagulation and fibrinolysis. In conditions of hemostatic imbalance—whether due to physiological changes, pharmacological interventions, or underlying pathology—these cleavage patterns may deviate from homeostatic norms.

Peptidomics, the mass spectrometry (MS)-based study of endogenous peptides, is a powerful technique for mapping hemostatic processes with high specificity and sensitivity (Alferez et al, 2025¹). This project focuses on developing and optimizing a peptidomics-based workflow to monitor alterations in proteolytic processing in the plasma of individuals with various forms of hemostatic dysregulation. The aim is to explore different methods for the efficient isolation of endogenous peptides from plasma while removing intact proteins and obtaining samples suitable for mass spectrometry analysis. In this way, molecular mechanisms and kinetics underlying proteolysis in hemostasis can be explored (for example, what happens in the proteolytic cascade when a coagulation factor is missing or impaired).

As part of this internship, you will gain hands-on experience in setting up peptidomics experiments, learning mass spectrometry sample preparation and method development, as well as performing proteomics data analysis. You will be involved in optimizing protocols, troubleshooting experimental procedures, and interpreting results that contribute to advancing our understanding of hemostatic processes.

Requirements:

- Currently pursuing a Master's in biomolecular/medical sciences, analytical chemistry, or a related field (within the Netherlands).
- Strong knowledge of laboratory practice and basic techniques.
- (Optional but advantageous) Experience with data analysis in R.
- Enthusiasm for working in a research-driven environment and an interest in proteomics and mass spectrometry.

Please send your motivation letter outlining your relevant experience and interest in the project, along with your CV, to the contact persons listed below.

Apply by 31st of August. Starting date is preferably mid-September/early October, for a minimum of 6 months.

Contact information:

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¹ Alferez, J. D. C., Kooiker, A., van Alphen, F. P., van der Zwaan, C., Brinkman, H. J., Meijers, J. C., ... & van Duijl, T. (2025). Proteolytic signatures of coagulation identified by plasma peptidomics. *Journal of Thrombosis and Haemostasis*.