NMR-IMPROV

Funded by the European Union

NMR relaxation tools for improving and protecting quality of dairy products

HORIZON-MSCA-2022-SE-01

Project ID 101131564

Training School

On-line: 18.03.2024 – 20.03.2024

Principles of NMR relaxation for non-specialists

The goal of the training school is to explain the principles of Nuclear Magnetic Resonance (NMR) processes for scientists representing various disciplines and to provide comprehensive tools to profit from the unique advantages of NMR relaxometry in molecular science.

We will:

- **Explain the NMR relaxation phenomenon, beginning with the structure of the atom and the concepts of spins and magnetic moments.**
- **Recapitulate the mathematics required for a quantitative description of NMR relaxation**
- **Explain the relationship of relaxation parameters to molecular dynamics and structure**
- **Provide examples of how to analyse NMR relaxation data for molecular systems of varying complexity**
- **Provide tips and strategies by performing such analysis yourself**
- **Answer (almost - let us be careful) all your questions**

Agenda (time CET)

Please reagister in advance fr all days

March 18th (Monday, 18.03.2024)

Link: https://videoconf-colibri.zoom.us/meeting/register/tJ0ldeyqrTwsHtBcUArvuj5WahLUd8Q6LUqu

9.00–9.15 Welcome (Danuta Kruk - University of Warmia and Mazury in Olsztyn)
9.15–10.45 Introduction to Nuclear Magnetic Resonance (NMR) phenomena and relaxation processes (Danuta Kruk)
10.45–11.15 Break
11:15–12.45 Mathematical tools – an overview in examples (Adam Kasparek - University of Warmia and Mazury in Olsztyn)
12.45–13.00 Session I – summary and questions
13.00–14.00 Break
14.00–15.30 Understanding the principles of NMR relaxation (Leonardo Brizi - Università di Bologna)
15.30–16.00 Break
16.00–17.30 Relationship between NMR relaxation and molecular dynamics – a quantitative approach (Danuta Kruk)
17.30–18.00 Session II – summary and questions

March 19th (Tuesday, 19.03.2024)

Link: https://videoconf-colibri.zoom.us/meeting/register/tJUkfuCtpzIqG9FR6Xpo1bZH6eH5QeDila4s

9.00–10.30 Examples of NMR relaxometry data analysis – part I (Pedro Sebastião - Instituto Superior Tecnico of Lisbon University)
10.30–11.00 Break
11.00–12.30 Examples of NMR relaxometry data analysis – part II (fitteia) (Pedro Sebastião)
12.30–13.00 Session III – summary and questions
13.00–14.00 Break
14.00–15.30 How to choose the proper relaxation models – predicting possible traps (Danuta Kruk)
15.30–16.00 Break
16.00–17.30 How to obtain translation diffusion coefficients from NMR relaxation data – practical guideline (Adam Kasparek)
17.30–18.00 Session IV – summary and questions

March 20th (Wednesday, 20.03.2024)

Link: https://videoconf-colibri.zoom.us/meeting/register/tJcqcO2rpzwqHdxjme4zggREabbksWPttymm

9.00–10.30 **Non-conventional modelling of NMR relaxation data** (Fabiana Zama and team - Università di Bologna)
10.30–11.00 Break
11.00–12.30 **Unexpected relaxation features** (Danuta Kruk and team)
12.30–13.00 **Session V – summary and questions**
13.00–14.00 Break
14.00–15.30 **The most challenging aspects of NMR relaxation – repetition** (all speakers)
15.30–16.00 Break
16.00–17.30 **Discussion with the audience and solving of indicated problems**
17.30–18.00 **Session VI – summary and questions**