Research in Lab of Biophysics II:

- Transport in porous bio-systems
- Advanced compositional and structural analysis of foods
- Development and application of:
  - NMR/ESR Spectroscopy
  - TD-NMR Relaxometry & Diffusometry
  - Magnetic Resonance Imaging & Spectroscopy

A. TD NMR analysis of foods, fruit, seed, biofilms
Relaxometric and diffusometric methods to assess effect of processing/ formulation on crispness of snacks, oil content, solid fat content, oil droplet size, water holding capacity, ....

B. Rheo-MRI: food structures under shear
Assessment of flow behavior of food dispersions and hybrid networks under shear

C. Micro-imaging and (localised) Spectroscopy 30, 300, 600 and 950 MHz

D. Mass transport during food processing
storage hydration cooking
MRI of water and fat transport and migration during processing

E. In vivo detection of aging mechanisms in dry seeds
ESR oximetry (metabolic activity, intactness of mitochondria), spin probe reduction (reducing agents) and MRI redox imaging

F. Polymer networks under stress
Tracking the diffusion of nanoparticles to evaluate the anisotropy level of food-mimicking polymer networks under stress.

G. Lipid oxidation in food
Mayonnaise
Identification and quantification of free radical intermediates of the primary oxidation in O/W food emulsions by ESR

H. Food mesoscale structures
Enzymatic degumming
Investigation of structure/dynamics of water domains in gums during enzymatic degumming of vegetable oil by heteronuclear (1H, 2H, 3P) NMR

I. Fat crystal mesoscale network structure
Multi-length-scale assessment of fat crystal structure by NMR and Small-Angle Scattering

Contact persons:
- Ana Pereira – projects B and F
- Julia Krug – project C
- Elena Golovina – project E
- Tatiana Nikolaeva – projects B, H and I
- Frank Vergeldt – projects A and D
- Donny Merkx – project G