

# NMR and NMR Imaging Investigations on Solid Dispersion Tablets



## Summary

We are developing and implementing nuclear magnetic resonance (NMR) and NMR imaging techniques to study water uptake, polymer mobilization and drug release from pharmaceutical solid formulations. The setup is in no way unique for pharmaceutical materials and may very well be applied to other fields.

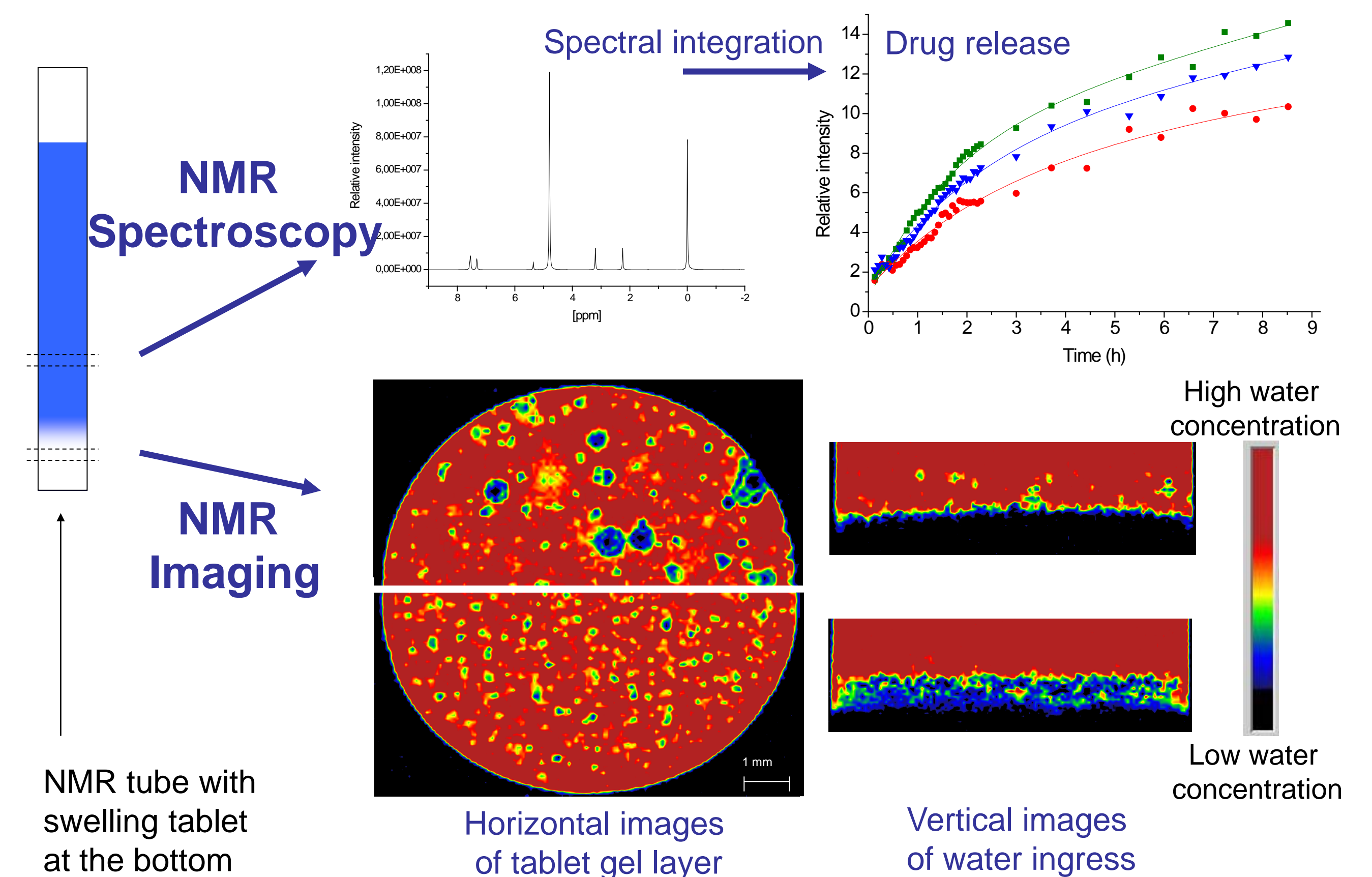
## Background

Designing controlled-release systems with desired properties requires a fundamental understanding of the molecular factors affecting the release profile. As NMR can be used to follow events non-invasively, such as water penetration, drug concentration, diffusion and polymer swelling, it is particularly suitable to monitor properties of dynamic pharmaceutical systems. The tablet structure e.g. inhomogenities and porosity can be monitored in parallel to the impact on solvent ingress and drug release in real time. All information obtained by NMR spectroscopy may be obtained on a spatially resolved basis by NMR imaging.

## Results

The figure to the right illustrates an example of how NMR and NMR imaging might be combined to obtain information about drug release and structural properties of the gel layer of a swelling tablet.

By choice of experimental parameters, the signal originating from e.g. polymers, drug substance and water can be imaged separately. This information combined provides a better understanding of the critical processes in controlled release formulations.



## Financing

Industry, Novartis Pharma

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