



Goethe CVI

Institute for Experimental and Translational  
Cardio Vascular Imaging  
University Hospital Frankfurt

Title:

**Towards improved clinical management of cardiac involvement in systemic lupus erythematosus by non-invasive cardiac magnetic resonance imaging**

Subtitle:

**Through our research achievements we bring the patients' benefit closer**

High cardiac morbidity and mortality is a recognised outcome-defining complication of systemic lupus erythematosus (SLE), yet there is a lack of cardiac-focused clinical care for these patients. Several issues can explain this precarious situation. The natural course of cardiac involvement is primarily subclinical affecting young (predominantly) female patients, which does not fit easily into the contemporary algorithms of cardiology practice. Classical cardiac symptoms, such as angina, rarely occur and if at all, are atypical – i.e. not particularly cardiac sounding, such as tiredness, dyspnoea, pleuritic chest pain. Also, SLE patients are commonly overwhelmed by symptoms from other organ systems, such as skin, joints or kidney involvement, taking their focus away from the heart. Eventually, only in a small proportion of patients would develop manifest heart failure, which is often poorly reversible and resistant to therapy.

Inflammation of cardiac muscle and vessels is the defining underlying pathophysiological mechanism of myocardial injury, as demonstrated in a recent paper by Winau et al in the *Annals of Rheumatic Diseases* (the highest-ranking journal in the rheumatology field). Furthermore, the cardiac inflammation can be detected and monitored non-invasively and with no radiation, using cardiac magnetic resonance imaging. The authors developed and validated an imaging signature of disease presence and its activity, which can serve as an algorithm to cardiac disease detection and monitoring of its activity, as well as may support the cardiac-focused adjustment of anti-inflammatory therapy. Thus, this important study offers a potential for tremendous progress towards a true paradigm shift in clinical management - away from the the non-sensitive, invasive and radiation-heavy methods, and towards patient-friendly and safe assessments (non-invasive, radiation- and for the major part – contrast agents-free), which can accurately inform on the disease presence, stage and severity, and gauge the treatment response.

This multicentre and multidisciplinary study was led by Priv Doz. Dr Valentina Puntmann, Institute for Experimental and Translational Cardiovascular Imaging – Goethe CVI, University Hospital Frankfurt) and builds on a decade-long record of investigation into cardiac inflammation by non-invasive imaging in systemic inflammatory diseases. This study was made possible by collaborative effort with a number of departments at University Hospital Frankfurt Rheumatology (Prof Dr. Burkhardt, Dr Braner, Dr Drott), Cardiology (Prof Dr Zeiher, Dr Schnoes) and (Prof Dr Vogl, Dr Arendt, Radiology) as well as in partnership with Guys and St Thomas' Hospital, London (Prof Dr David D'Cruz, Louise Coote Lupus Unit, Dr Gerry Carr-White, Dept of Cardiology, Prof Dr Mike Marber, Cardiovascular Sciences of King's College London) and Prof Dr Karin Klingel (University of Tübingen).

With greatest thanks to our patients for their trust and support – it is our honour to be able to serve you!

Supported by British Research Council award to Guys and St Thomas' Hospital and the DZHK award to Prof Dr Nagel, Institute of experimental and translational cardiovascular Imaging. Dr Hinojar was supported by Spanish Society of Cardiology.