Supplementary Information

Feasibility study of MR-guided pancreas ablation using high intensity focused ultrasound in a healthy swine model

MSc. Lukas Christian Sebeke\textsuperscript{a,b}, Dr. Pia Rademann\textsuperscript{c},

Dr. Alexandra Claudia Maul\textsuperscript{c}, Dr. rer. nat. Claudia Schubert-Quecke\textsuperscript{c},

Univ-Prof. Dr. Thorsten Annecke\textsuperscript{d}, Dr. Sin Yuin Yeo\textsuperscript{b,e},

Dr. Juan Daniel Castillo-Gómez\textsuperscript{b}, Patrick Schmidt\textsuperscript{b},

Univ.-Prof. Dr. Holger Grüll\textsuperscript{a,b,*}, Dr. Edwin Heijman\textsuperscript{b,f}

\textsuperscript{a}Eindhoven University of Technology, Department of Biomedical Engineering; P.O. Box 513, 5600MB Eindhoven, The Netherlands

\textsuperscript{b}University of Cologne, Faculty of Medicine and University Hospital of Cologne, Institute of Diagnostic and Interventional Radiology; Kerpener Str. 62, 50937 Cologne, Germany

\textsuperscript{c}University of Cologne, Faculty of Medicine and University Hospital of Cologne, Experimental Medicine; Ostmerheimer Str. 200, 51109 Cologne, Germany

\textsuperscript{d}University of Cologne, Faculty of Medicine and University Hospital of Cologne, Department of Anesthesiology and Intensive Care Medicine; Kerpener Str. 62, 50937 Cologne, Germany

\textsuperscript{e}Profound Medical GmbH; Kehrwieder 9, 20547 Hamburg, Germany

\textsuperscript{f}Philips Research Eindhoven; High Tech Campus 34, 5656 AE Eindhoven, The Netherlands
S1: Technical drawing of compression spacer

Dimensions and annotations are labeled as follows:
- Width: 280 mm
- Length: 280 mm
- Angle: 90°
- Radius: R70
- Additional dimensions and annotations may be present in the drawing.
S2: Acoustic properties

The polyacrylamide material from which the spacers were manufactured was characterized using the finite-amplitude insertion-substitution (FAIS) method. The measurements were performed by the Therapy Ultrasound team of the Joint Department of Physics / Division of Radiotherapy and Imaging at the Institute of Cancer Research, London, UK. Measurements at different temperatures were taken in ascending order up to 50 °C. Two additional measurements were performed during cooldown at 37 °C and 25 °C.

Table 1: Acoustic Properties of the polyacrylamide material used in manufacturing the spacer. The rows “37 down” and “25 down” were measured during cooldown. SoS: Speed of Sound.

| Temperature [°C] | Thickness [cm] | SoS [m/s] | Attenuation [dB/cmMHz] | Exponent of attenuation coefficient |
|------------------|----------------|-----------|------------------------|-----------------------------------|
| 20               | 1.55 ± 0.02    | 1516 ± 0.5| 0.044 ± 0.006          | 1.75 ± 0.11                       |
| 25               | 1.55 ± 0.03    | 1528 ± 0.7| 0.036 ± 0.005          | 1.83 ± 0.08                       |
| 30               | 1.54 ± 0.03    | 1539 ± 0.8| 0.036 ± 0.005          | 1.69 ± 0.08                       |
| 37               | 1.54 ± 0.03    | 1552 ± 0.9| 0.031 ± 0.005          | 1.78 ± 0.11                       |
| 50               | 1.54 ± 0.03    | 1567 ± 0.8| 0.019 ± 0.005          | 2.03 ± 0.17                       |
| 37 down          | 1.58 ± 0.02    | 1553 ± 0.8| 0.031 ± 0.005          | 1.82 ± 0.08                       |
| 25 down          | 1.59 ± 0.02    | 1529 ± 0.8| 0.034 ± 0.004          | 1.82 ± 0.08                       |