Supplemental Figures for Manuscript:
“Metal-Assisted and Microwave-Accelerated Decrystallization of Pseudo-Tophus in Synthetic Human Joint Models

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Figure S1. Model 1: Average Percent Mass Reduction (PMR), Time (Seconds) to Microwave-Induced Synthetic Skin Patch Damage, and Change in Temperature (°C) of a Closed Synthetic Joint exposed to 7 MAMAD Sessions (5 W).

(a) Average Percent Mass Reduction (PMR)

| MAMAD Sessions | 1  | 2  | 3  | 4  | 5  | 6  | 7  |
|----------------|----|----|----|----|----|----|----|
| Pseudo-Tophi (mg) | 305 | 340 | 358 | 363 | 389 | 367 | 375 |
| Pseudo-Tophi + Au NPs (mg) | 414 | 197 | 431 | 304 | 488 | 478 | 492 |
| Wet Pseudo-Tophi (mg) | 340 | 358 | 363 | 369 | 367 | 375 | 378 |
| Dry Pseudo-Tophi (mg) | 293 |    |    |    |    |    |    |
| Pseudo-Tophi Mass Difference (mg) | 12 |    |    |    |    |    |    |
| Average Percent Mass Reduction (%) | 4 |    |    |    |    |    |    |

(b) Closed Synthetic Joint: Δ Temperature (°C)

(c) Microwave-Induced Synthetic Skin Patch Damage

| MAMAD Sessions | Time (sec) to Damage |
|----------------|----------------------|
| 1              | 60                   |
| 2              | 90                   |
| 3              | 120                  |
| 4              | 120                  |
| 5              | 60                   |
| 6              | 120                  |
| 7              | 90                   |

Figure S1. Model 1: Average Percent Mass Reduction (PMR), Time (Seconds) to Microwave-Induced Synthetic Skin Patch Damage and Change in Temperature (°C) of a Closed Synthetic Joint exposed to 7 MAMAD Sessions (5 W). (a) Table shows the masses (mg) of pseudo-tophi, pseudo-tophi + Au NPs, wet and dry pseudo-tophi, the pseudo-tophi mass difference, and the average PMR (%). (b) Graph shows microwave-induced temperature changes recorded at 30-second intervals during 7 MAMAD Sessions (5 W). (c) Table shows time to microwave-induced synthetic skin patch damage.
Figure S2. Model 2: Time to Microwave-Induced Damage to Synthetic Skin Patches from and Change in Temperature (°C) of Three Closed Synthetic Joints during Exposure to the first 7 of 21 MAMAD Sessions (5 W)

(a) Microwave-Induced Synthetic Skin Patch Damage

| MAMAD Sessions | Time (sec) to Damage | Time (sec) to Damage | Time (sec) to Damage |
|----------------|----------------------|----------------------|----------------------|
| 1              | 60                   | 90                   | 120                  |
| 2              | 120                  | 120                  | 30                   |
| 3              | 90                   | 60                   | 60                   |
| 4              | 120                  | 60                   | 60                   |
| 5              | 120                  | 60                   | 90                   |
| 6              | 120                  | 90                   | 90                   |
| 7              | 30                   | 60                   | 60                   |

(b) Closed Synthetic Joint: Temperature Change

Figure S2. Model 2: Time to Microwave-Induced Damage to Synthetic Skin Patches from and Change in Temperature (°C) of Three Closed Synthetic Joints during Exposure to the first 7 of 21 MAMAD Sessions (5 W) (a) Table shows the time (seconds) to microwave-induced damage to synthetic skin patches from three closed synthetic joints during exposure to the first 7 of 21 MAMAD Sessions (5 W). (b) Microwave-induced temperature (°C) changes in a closed synthetic joint during 7 MAMAD Sessions.
Figure S3. Model 2: Change in Temperature (°C) during Application of the first 7 of 21 MAMAD Sessions in a Closed or Open Synthetic Joint with Embedded Pseudo-Bursas containing Pseudo-Tophi and Au NPs or Deionized Water. Graphs show the internal temperature (°C) changes of the closed or open synthetic joint during exposure to the first 7 of 21 MAMAD Sessions for three different closed or open synthetic joints. The final temperatures of both the closed and open synthetic joints remained in the initial temperature ranges.
Figure S4. Model 3: Change in Temperature (°C) during Application of 18 MAMAD Sessions in a Rotated Open Synthetic Joint (MWH on Right, Top, and Left Sides) with a Pseudo-Bursa containing a Pseudo-Tophus Submerged in Au NPs and Dehydrated after every 3 MAMAD Sessions.

Graphs show the internal temperature (°C) changes of the rotated open joint during exposure to 18 MAMAD Sessions at 5 W (18 MAMAD Sessions = 3 x 120-second MWH on the right, top, and left sides of the open synthetic joint = 360 seconds x 6 Trials = 2,160 seconds of MWH) and 1 hour of dehydration after every 3 MAMAD Sessions (after each side). The initial temperature range of the rotated open synthetic joints was 17 - 26 °C and final temperatures remained relatively constant.
Figure S5 (Replot of Figure 7). Model 2. SEM images of pseudo-tophi after application of 7 MAMAD sessions in a closed joint with a pseudo-bursa containing a pseudo-tophus submerged in Au NPs and dehydrated after 7 MAMAD sessions. Dry tophi is a control sample and shows the surface properties of the tophi before the application of 7 MAMAD sessions. Scale bar is 2 μm.
**Figure S6 (Replot of Figure 7). Model 2.** SEM images of pseudo-tophi after application of 7 MAMAD sessions in a closed joint with a pseudo-bursa containing a pseudo-tophus submerged in Au NPs and dehydrated after 7 MAMAD sessions. Dry tophi is a control sample and shows the surface properties of the tophi before the application of 7 MAMAD sessions. Scale bar is 200 μm.