Electronic Supporting Information (ESI) for

Absorptive supramolecular elastomer wound dressing based on polydimethylsiloxane-(polyethylene glycol)-polydimethylsiloxane copolymer: Preparation and characterization

Wenwen Deng, [a] Yufeng Lei, [a] Shengwen Zhou, [a] Anqiang Zhang, [a,*] Yaling Lin [b,*]

a. College of Material Science and Engineering, South China University of Technology, 381 Wushan Rd., Guangzhou 510641, Guangdong, China.

b. College of Materials and Energy, South China Agriculture University, 483 Wushan Rd., Guangzhou 510642, Guangdong, China.

Part S1. Charaterization of ESESi

Part S2. Bacterial permeation experiments

Part S3. Over-all view of the H&E stained wound tissues

Part S1. Charaterization of ESESi

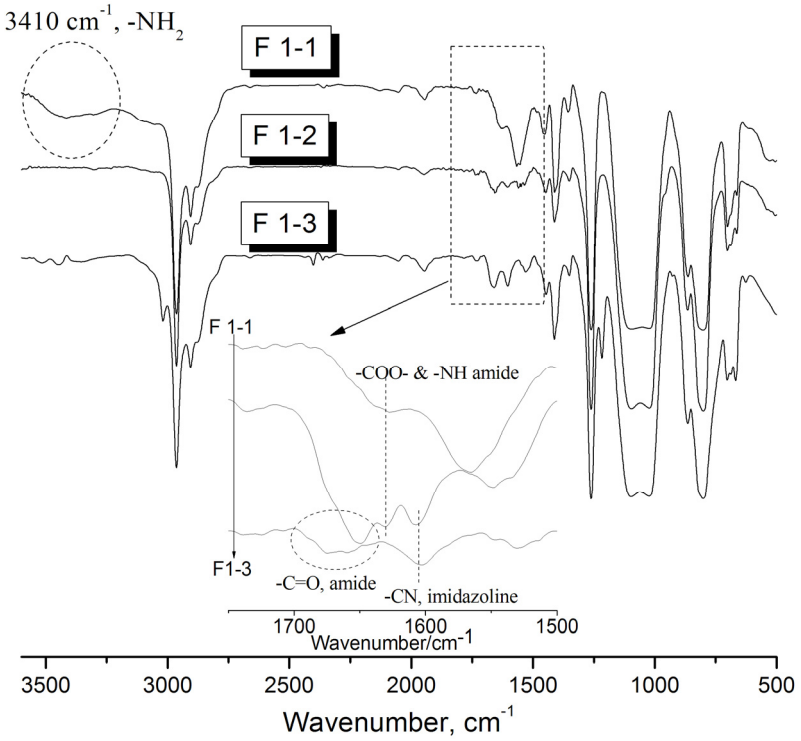


Figure S1. FT-IR spectra of samples collected during in the Stage 1 reaction to prepare ESESi: F 1-1: mixture of PDMS-$COOH_2$ and DETA before starting to heat, F 1-2: sample was collected when temperature reached 135 ºC, F 1-3: sample was collected after stopping reaction

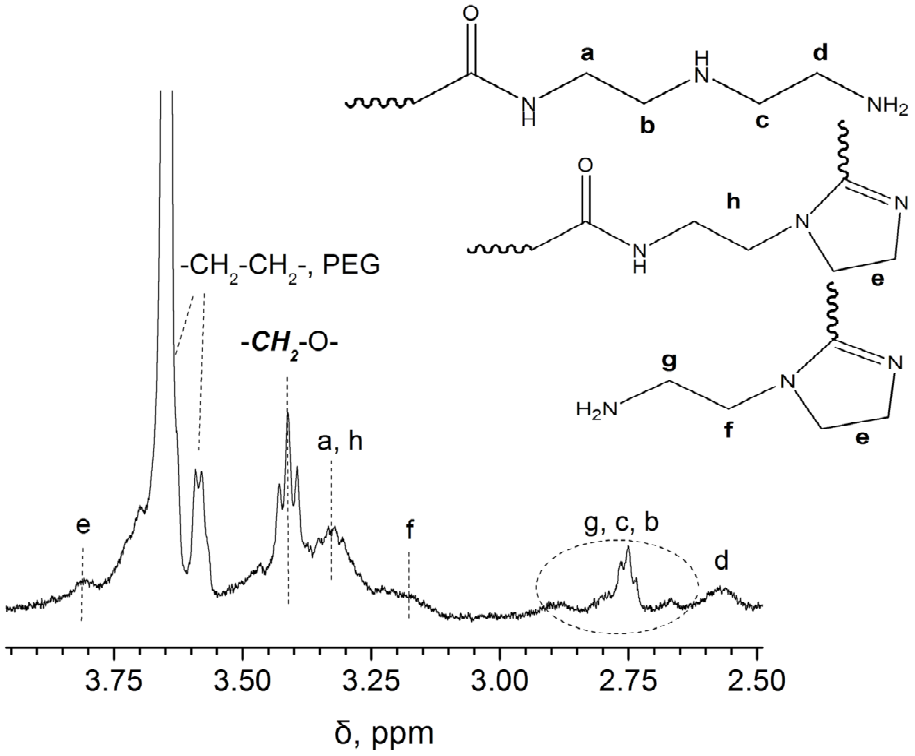


Figure S2. ^{1}H-NMR spectra of the product of the Stage 1.

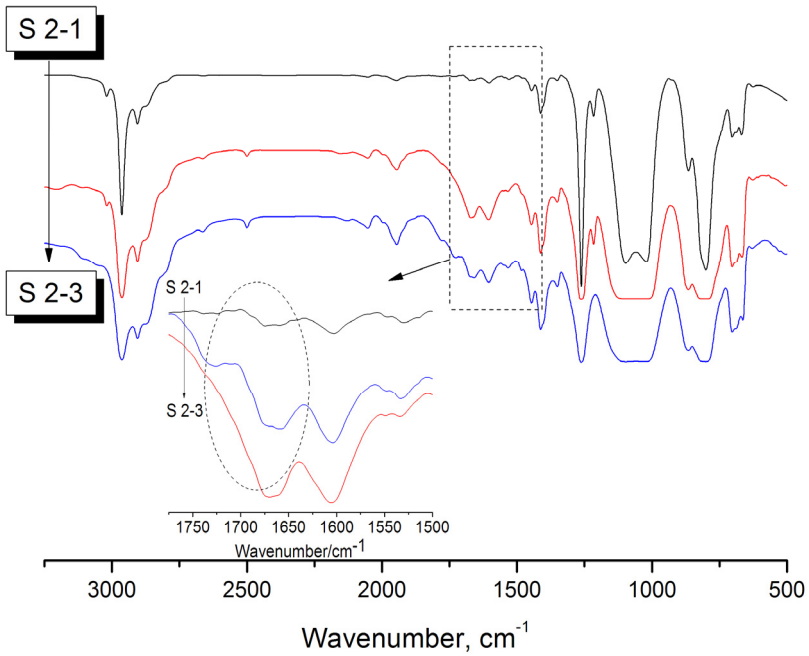


Figure S3. FT-IR spectra of samples collected during in the Stage 2 to prepare ESESi: S 2-1: mixture of reactants; S 2-2: sample was collected after temperature reached 135ºC; F S-3: sample was collected when the reaction was ended.

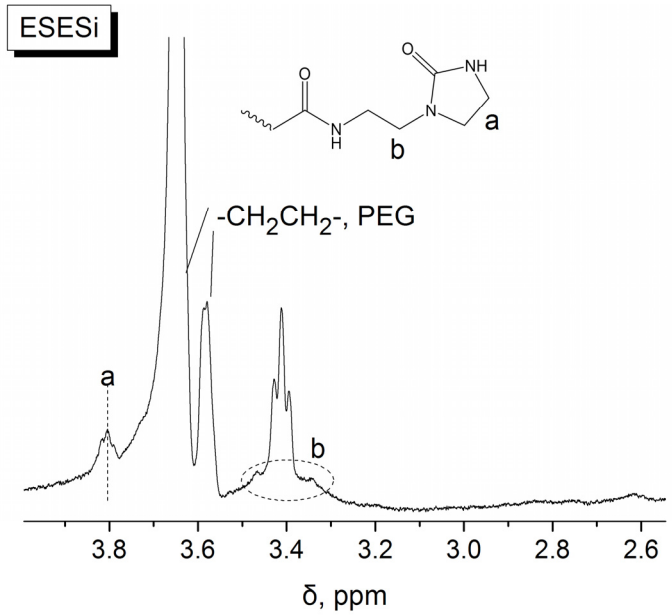


Figure S4. ^{1}H-NMR spectra of ESESi.

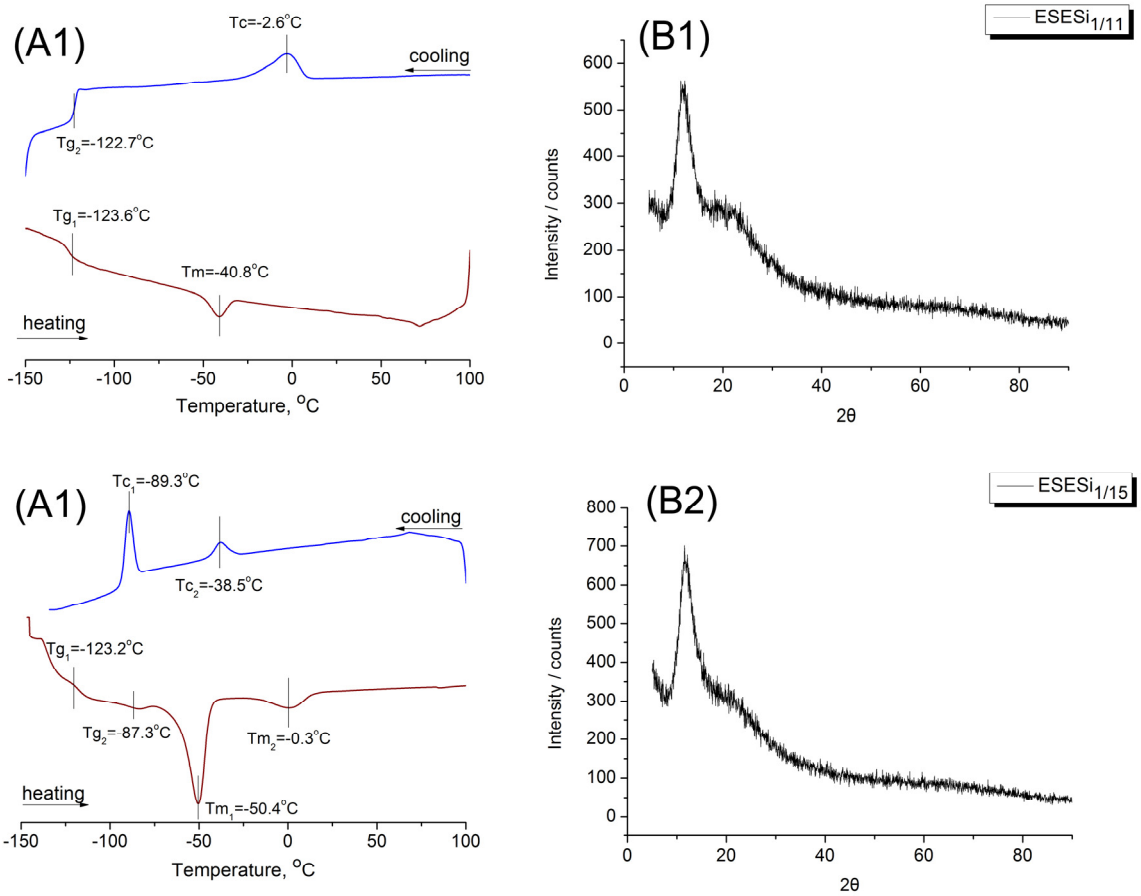


Figure S5. Typical curves of (A) DSC and (B) XRD curves of $ESESi_{1/11}$ and $ESESi_{1/15}$.

Part S2. Bacterial permeation experiments

The membranes were sterilized by irradiation with 75% ethanol and then ultraviolet light for 30 min. *E. coli* and *S. cremoris* were cultured aerobically at 37 °C and shaken at 150 rpm for 12-16 h. Sterilized samples of the ESESi film, the SESi film, the Tegaderm ™ film and the vaseline gauze were cut into circular discs (diameter 10 mm) and placed on the center of an agar dish. Next, the bacterial suspensions were diluted to 1×10^9 colony-forming units (CFU)/mL, 20 mL of these suspensions were added to the center of each sample, and the inoculum was uniformly plated on the surface of each sample. After incubation at 37 °C for 24 h, the agar under each sample was cut with a knife and placed into a tube containing 2 mL of PBS. The bacteria on the agar were detached for 4 min using an ultrasonic cleaner, and the numbers of bacteria were determined by routine CFU analysis on an agar dish with different dilutions.

As shown in **Figure S6**, the vaseline gauze cannot protect against *E. coli* or *S. cremoris* permeation. In contrast, ESESi films completely prevent bacterial invasion, as do the controls (SESi film and Tegaderm ™ film).

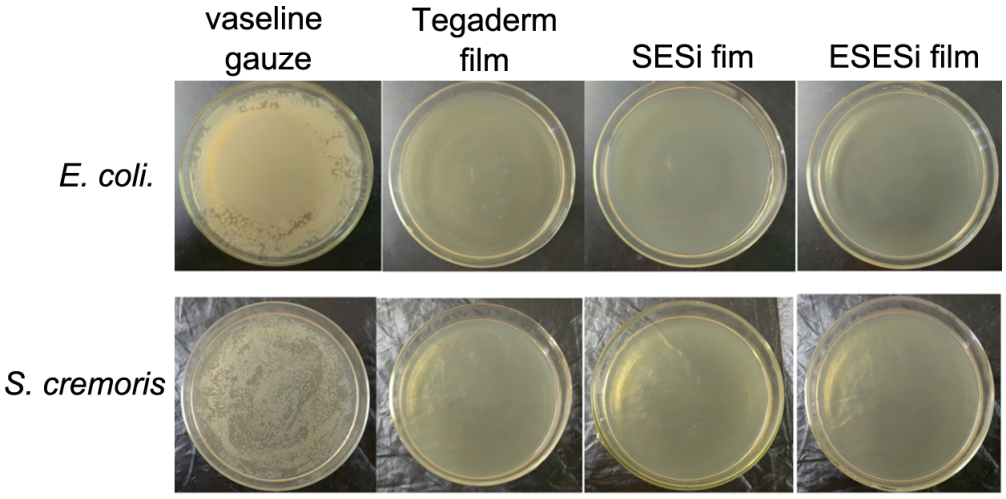
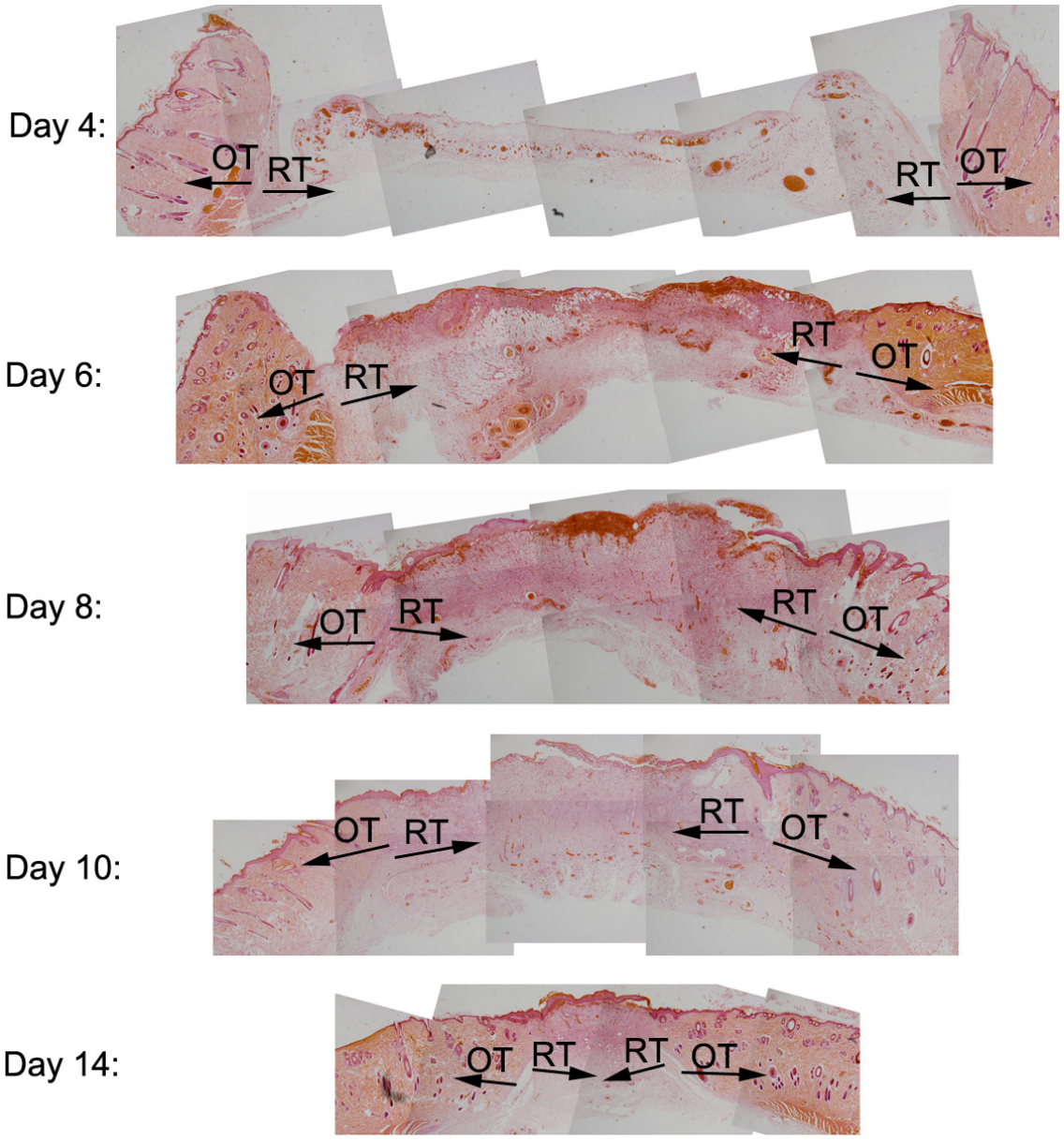


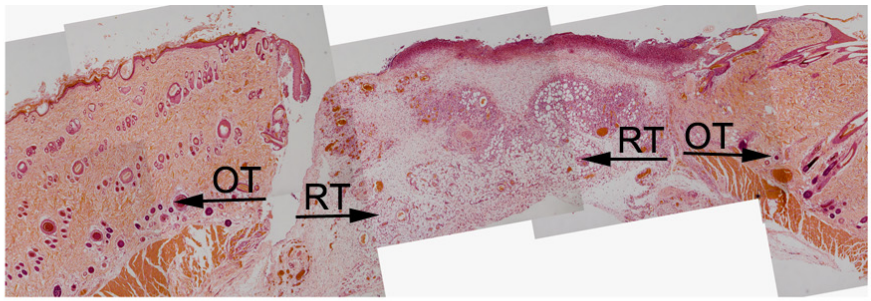
Figure S6. The photos of bacterial permeation experiments.

Part S3. Over-all view of the H&E stained wound tissues

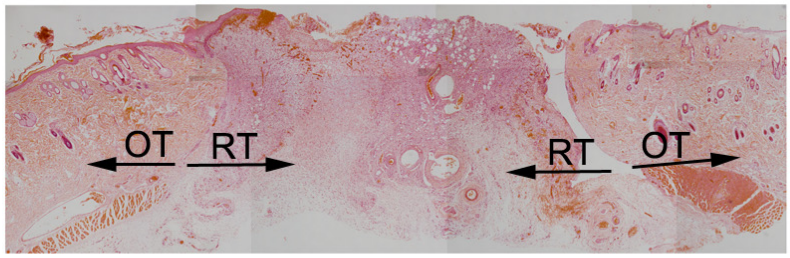


(A) Vaseline gauze

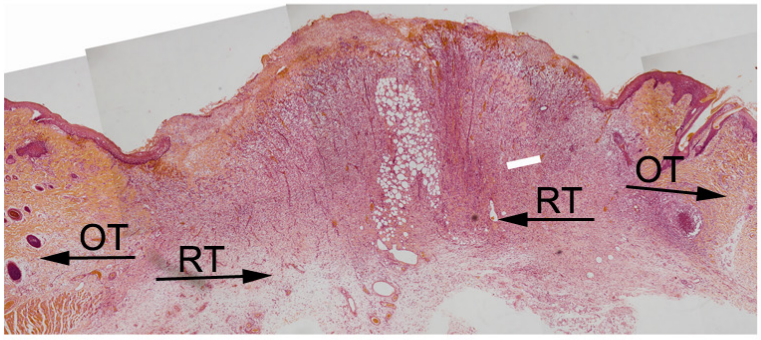
Day 4:



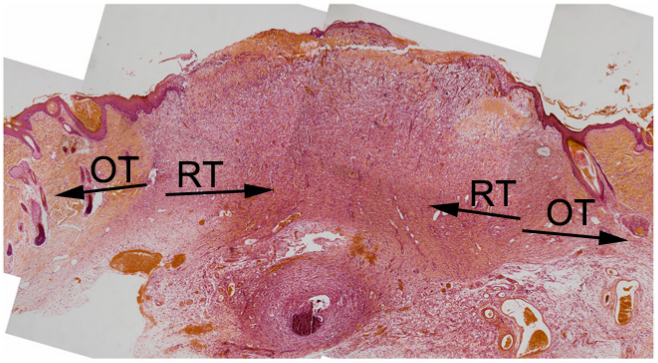
Day 6:



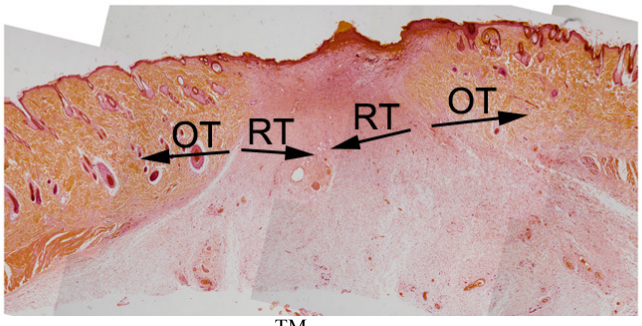
Day 8:



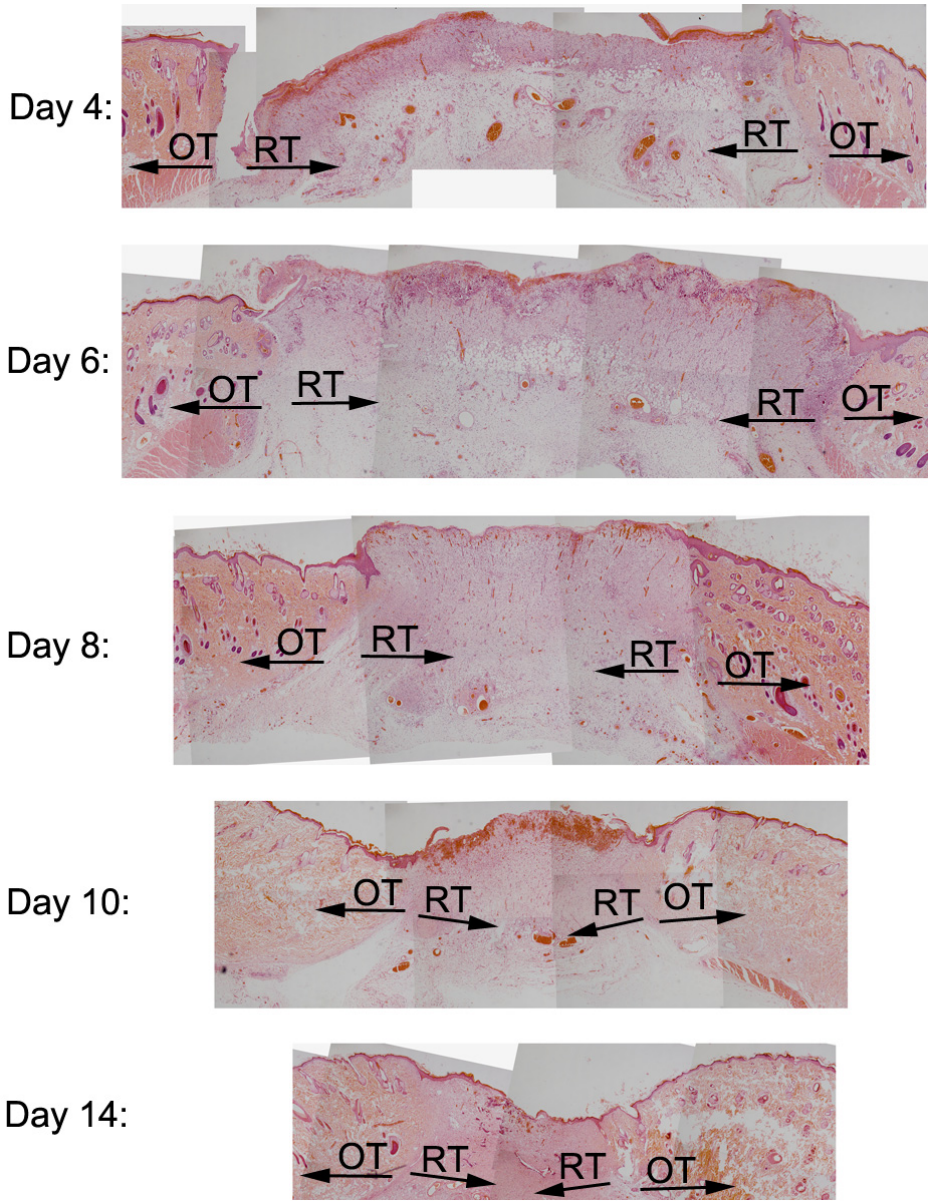
Day 10:



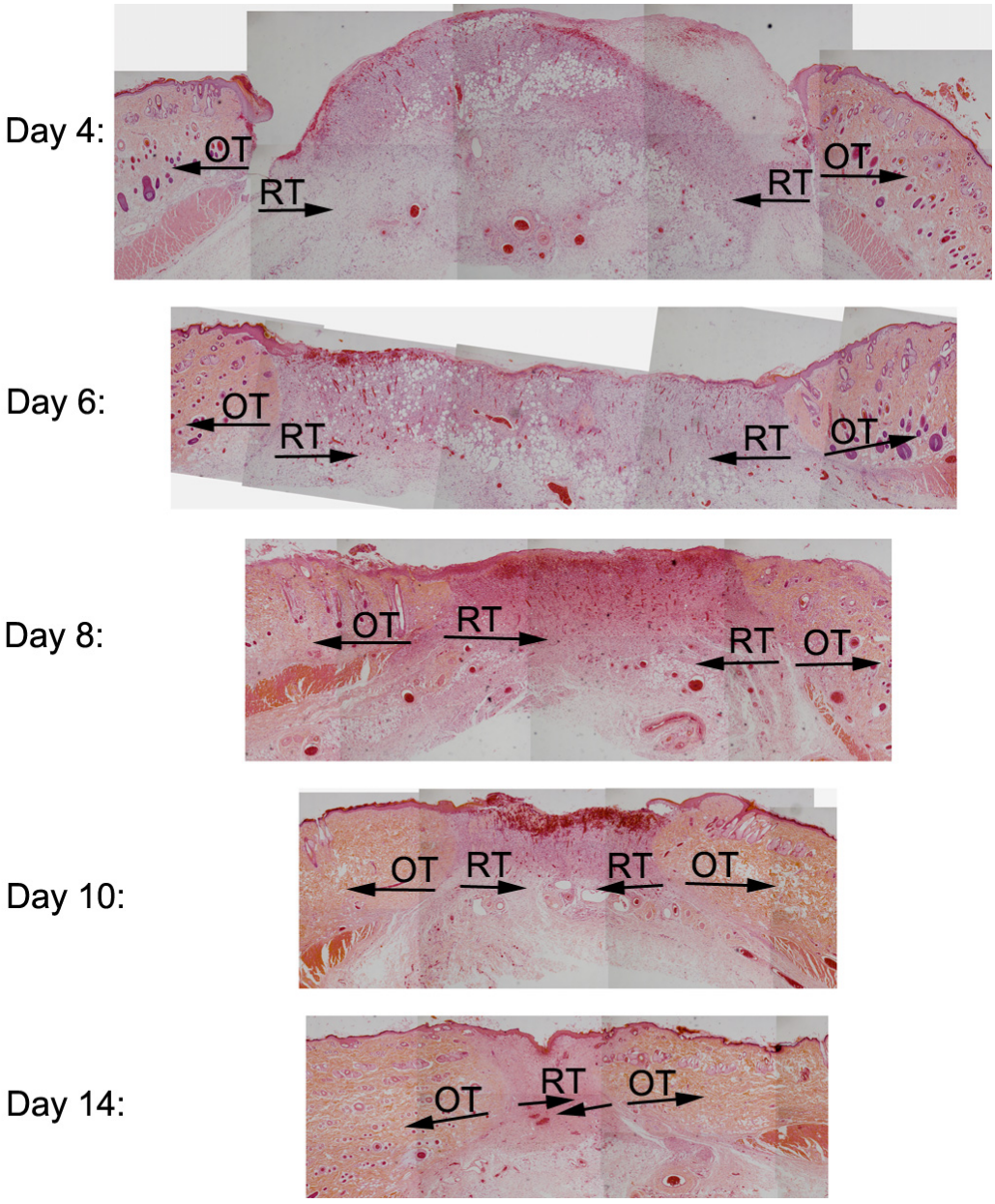
Day 14:



(B) 3M Tegaderm ^{TM} film


Day 4:
OT
RT
RT
OT
Day 6:
OT
RT
RT
OT
Day 8:
OT
RT
RT
OT
Day 10:
OT
RT
RT
OT
Day 14:
OT
RT
RT
OT

(C) SESi film



(D) ESESi film

Figure S7. Over-all view of the H&E stained wound tissues (40×): (A): Vaseline gauze; (B) Tegaderm film; (C) SESi film and (D) ESESi film.

(OT: original tissue; RT: recovered tissue)