Supplementary Information

Shielding against Breast Tumor Relapse with an Autologous Chemo-Photo-Immune active Nano-Micro-Sera based Fibrin Implant

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**Figure S1.** Low magnification TEM image of Lap-NS
**Figure S2:** XPS survey of A) Lapatinib, B) human serum, C) Lapatinib-NanoSera and D) Table for atomic % of different elements.
Figure S3: X-Ray diffraction pattern of Lapatinib and Lapatinib-NanoSera.
Figure S4: a) Fibrin glue (FG) without and with NMS embedded b) FESEM of FG.

Figure S5: Percentage cumulative drug release of Imiquimod-Microsersa(IMQ-MS) at pH=6.4 and pH=7.4 in the presence of proteinase K.
**Figure S6:** SDS-PAGE analysis of serum retrieved from Lap-NS synthesized from donor A, B and C (L-ladder).

**Figure S7:** UV-Vis-NIR extinction spectra of PNS synthesized with different serum sources (HS-Human serum, MS-Mouse serum and FBS-Fetal bovine serum).
Figure S8: A) HRTEM image of PNS showing 0.23 nm fringe spacing B) SAED pattern of PNS.

Figure S9: A) Ex vivo fluorescence imaging of major organs from Lapatinib-NanoSera tagged with ICG (Lap-ICG), Free ICG and Imiquimod-MicroSera tagged with ICG (IMQ-ICG). T, Li, Lu, K, H and S stands for Tumor, Liver, Lung, Kidney, Heart and Spleen respectively B) Fluorescence intensity of Free-ICG, Lap-ICG and IMQ-ICG calculated from imagej.
Figure S10: Representative flow cytometry plots of CD11c+ in Group 1-FG, Group 2-Lap+PNSL-FG, Group 3-IMQ-MS-FG and Group 4-NMS
Figure S11: Representative flow cytometry plots of CD80+ in Group 1-FG, Group 2-Lap+PNSL-FG, Group 3-IMQ-MS-FG and Group 4-NMS
Figure S12: Representative flow cytometry plots of CD86^+ in Group 1-FG, Group 2-Lap+PNSL-FG, Group 3-IMQ-MS-FG and Group 4-NMS.

Figure S13: Serum TNF-α levels at day-3 post treatment (1-FG, 2-Lap+PNSL-FG, 3-IMQ-MS-FG, 4-NMS-FG, 5-Control) (n = 4 to 6), *p≤0.05.
Figure S14: Representative flow cytometry plots of FoxP3+ in Group 1-FG, Group 2-Lap+PNSL-FG, Group 3-IMQ-MS-FG and Group 4-NMS.
Figure S15: Representative flow cytometry plots of CD8a+ in Group 1-FG, Group 2-Lap+PNSL-FG, Group 3-IMQ-MS-FG and Group 4-NMS.
Figure S16: Body weight during the course of 15 days in IMQ-MS-FG, Lap+PSNL-FG and NMS.

Figure S17: Histological analysis of NMS and AG at 50th day (10x, scale bar 100 µm)

Supplementary Video - 1 shows Surgical Resection of 4T1 Tumor in BALB/c mice followed by Application of Autologous Hybrid Fibrin Implant and Closure of Surgical Site. (Vial-1: Tranexamic acid + PRP and Vial-2: PNS + 0.25M Ca²⁺)