**Supplemental materials**

*Orthotopic partial liver transplantation*

Orthotopic pLTx using 20% right and caudate lobe grafts was performed by modification of the method of Kamada et al[1]. All procedures were performed under general anesthesia with isoflurane (Escain, Mylan, Osaka, Japan) via small animal anesthetizer (MK-A110, Muromachi Kikai Co., Ltd., Tokyo, Japan). The animals’ body temperature was maintained at 36.5 ± 0.5°C with a heating pad (Midori shokai, Hiroshima, Japan).

*Donor operation*

After midline laparotomy followed by bilateral subcostal incisions, the liver was carefully mobilized from all ligamentous attachments. The infrahepatic vena cava (IHVC) was separated from the right adrenal vessels. The common bile duct was divided and cannulated with a 24-gauge (G) catheter (Terumo, Tokyo, Japan). The portal vein (PV) was isolated by transecting the pyloric and splenic veins. After heparinization with 300 IU of heparin (Mochida Pharmaceutical Co., Ltd., Tokyo, Japan), in situ liver perfusion with 50 mL of ice-cold HTK solution was initiated through aorta with manually controlled pressure. The infra-hepatic vena cava (IHVC) was clamped by an atraumatic microvascular clip (AS-1, Nastume seisakujo Co., Ltd, Tokyo, Japan). Then we isolated and divided the common hepatic artery (CHA) with ligations of its tributaries, namely, the left gastric, splenic and gastroduodenal arteries. The suprahepatic vena cava (SHVC) was transected and the whole liver graft was removed and immediately transferred into a basin filled with HTK solution at 4°C.

*Ex Vivo Graft Preparation (Back-table Procedures)*

First, a cuff, made from a 14-G catheter (Terumo, Tokyo, Japan), was attached to the PV. Then, the median, left lateral and superior/inferior caudate lobes were all excised ex vivo by ligating all the pedicles to those lobes. Careful attention should be paid to avoid stenosis or stricture in the pedicles to the right lobes. The remaining right superior + inferior lobes and total paracaval portion of the caudate was used as partial liver graft, which was estimated to approximately 21.5% of the whole liver[2]. After securing the vessels over the cuff with a circumferential 6-0 silk suture, the SHVC was trimmed and attached with three 7-0 polypropylene sutures (Prolene; Ethicon, Inc., Cornelia, GA). Then partial liver grafts were stored for 4 hours at 4°C in HTK.

*Recipient operation*

Under general anesthesia with isoflurane (2 Vol%), laparotomy was performed via bilateral subcostal incisions. After mobilization of the liver, the bile duct was transected at the proximal end. The proper hepatic artery (PHA) was ligated at its bifurcation and dissected toward its cranial side. In Group-W688X, W688X (200 Units in 1.5ml PBS solution) was administered via the penile vein, while in Group-vehicle, the same volume of vehicle was infused. Afterwards, IHVC, PV, and SHVC were clamped. These vessels were divided and the recipient native liver was removed. During anhepatic time, isoflurane was reduced to 0.3 Vol%. The partial liver graft was then gently placed in the right subphrenic space. The SHVC was reconstructed in an end-to-end fashion using continuous 7-0 polypropylene sutures (Prolene; Ethicon, Inc., Cornelia, GA). PV anastomosis was performed by pulling the stump of recipient’s PV over the cuff and was secured with a circumferential 6-0 silk suture. After completing the anastomoses of the PV and SHVC, the liver was reperfused. IHVC was thereafter reconstructed in an end-to-end fashion using continuous 8-0 polypropylene (Prolene; Ethicon, Inc., Cornelia, GA) sutures. Then, either W688X or its vehicle (PBS) was administered again in the same fashion. Anhepatic time (clamping time of the portal vein) was 14 ± 1 minutes (mean ± standard deviation [S.D.]) in all experiments. As for the arterial reconstruction, we employed the sleeve technic from graft’s CHA to recipient’s PHA, as described previously[3]. The bile duct was reconstructed by tying the duct over a 24-G tube stent (Termo, Tokyo, Japan) and the abdominal incision was closed with 4-0 silk continuous sutures.

**Figure legends**

**Supplemental figure 1: ADAMTS13 expressions in each genotypes. (A)** Plasma ADAMTS13 activity in wild (+/+), hetero (+/-) and knockout (-/-) mice. Data are shown as means ± SEM (n = 6 each). **(B)** Hepatic mRNA expressions coding for ADAMTS13 in WT and KO mice.

**Supplemental figure 2: Plasma ADAMTS13 activity during IRI.** Plasma ADAMTS13 activity during 70% partial hepatic IRI in the experimental 4 groups. Intravenous administration of W688X increased the activity to the maximal level at 2 hours of reperfusion (923.9 ± 103.1% in WT + W688X, and 630.8 ± 71.4% in KO + W688X), then gradually decreased and returned to the control level by 24 hours. Vehicle-treated animals (WT + vehicle and KO + vehicle) exhibited lower ADAMTS13 activity (30-40%, and 0-5%, respectively) throughout IRI.

**Supplemental figure 3: Negative controls for CD42b staining.** Immunofluorescence stained with normal rabbit IgG instead of primary antibody (CD42b) as negative controls. A scale bar in right lower panel represents 100 µm.

**Supplemental figure 4: Rat model of orthotopic partial (20%) liver transplantation.** Representative photographs of the 20% partial liver graft after ex vivo preparation and after all the anastomoses

**Supplemental figure 5: Plasma ADAMTS13 activity after transplantation.** Plasma ADAMTS13 activity decreased less than 30% at 2, 6, and 24 hours after reperfusion in vehicle group, reflecting the impaired liver function with small-for-size grafts. W688X treatment could maintain more than 200% of plasma ADAMTS13 activity for at least 24 hours after reperfusion.

**Reference**

[1] N. Kamada, and R.Y. Calne, Orthotopic liver transplantation in the rat. Technique using cuff for portal vein anastomosis and biliary drainage. Transplantation 28 (1979) 47-50.

[2] N. Madrahimov, O. Dirsch, C. Broelsch, and U. Dahmen, Marginal hepatectomy in the rat: from anatomy to surgery. Annals of surgery 244 (2006) 89-98.

[3] Y. Sato, O. Farges, E. Akpinar, S. Yunming, B. Yunming, and H. Bismuth, An easy and physiologic arterial reconstruction method (sleeve technique) for orthotopic rat liver transplantation. Transplantation proceedings 28 (1996) 3649-51.