

Pro-resolving lipid mediator ameliorates obesity induced osteoarthritis by regulating synovial macrophage polarisation

**Antonia RuJia Sun ¹, Xiaoxin Wu ³, Bohao Liu ³, Yang Chen ³, Charles W. Armitage⁴,
Avinash Kollipara^{4,5}, Ross Crawford ^{1,2}, Kenneth W. Beagley⁴, Xinzhan Mao ^{3*}, Yin Xiao ^{1,6}
and Indira Prasadam ^{1,6*}**

¹Institute of Health and Biomedical Innovation, Faculty of Science and Engineering, Queensland University of Technology, Brisbane, Australia, 4059

²The Prince Charles Hospital, Orthopedic Department, Brisbane, Australia

³Department of Orthopaedic Surgery, Second Xiangya Hospital, Central South University, Changsha, China

⁴Institute of Health and Biomedical Innovation, Faculty of Health, School of Biomedical Sciences, Queensland University of Technology, Brisbane, Australia

⁵Department of Pediatrics, School of Medicine, The University of North Carolina at Chapel Hill, Chapel Hill, USA.

⁶Australia–China Centre for Tissue Engineering and Regenerative Medicine, Queensland University of Technology, Brisbane, Queensland, Australia

***Corresponding author**

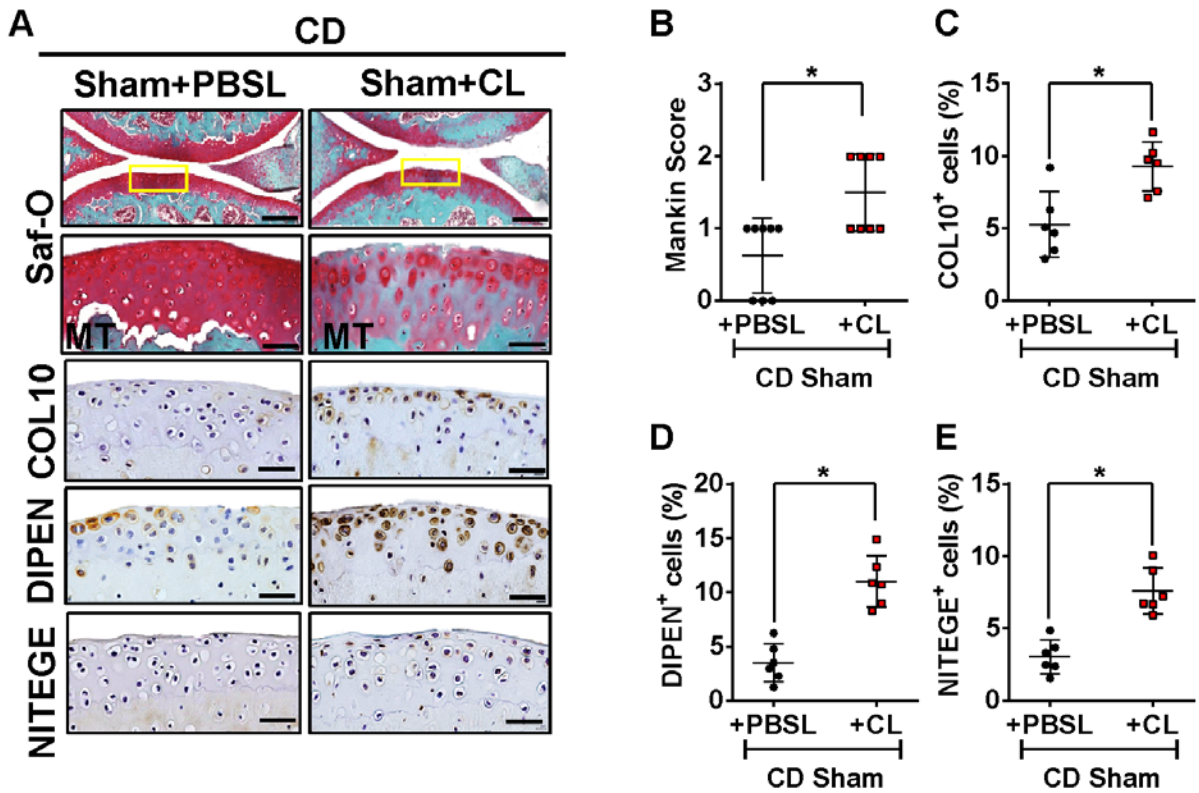
Indira Prasadam, Ph.D.

Email: i.prasadam@qut.edu.au

Prof Xinzhan Mao, MBBS, FRACS, DPhil.

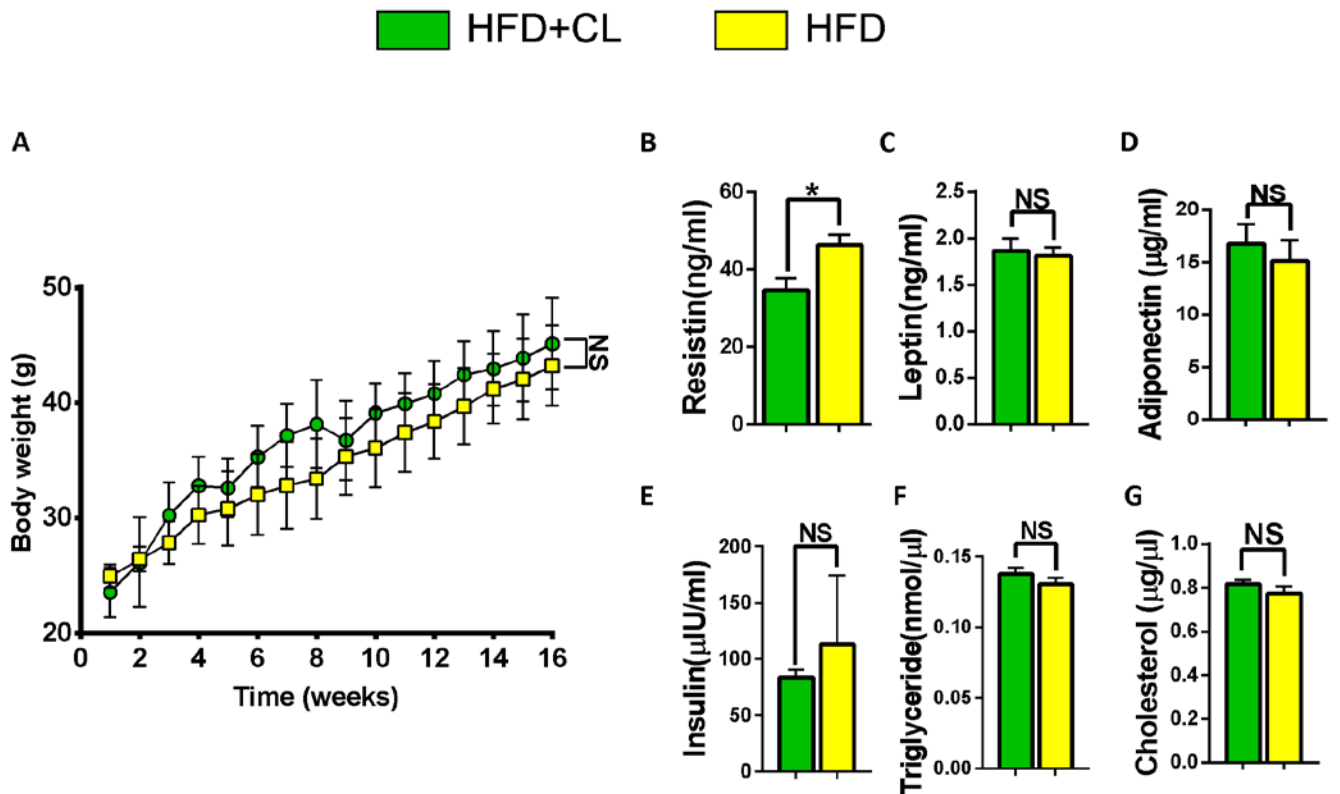
E-mail: maoxinzhan72@126.com

Supplementary Figure 1



Supplementary Figure 1: Clodronate liposome causes cartilage damage in CD-fed mice. (A) Top panel: Representative Safranin O and fast green stained sagittal sections of knee regions in mice fed CD after Clodronate liposome treatment. Scale bars, 100 μ m. The inset boxes in upper re shown at higher resolution in lower panels. Scale bars, 100 μ m. Bottom panel: Similar sections were stained with COL10, DIPEN, and NITEGE to determine if Clodronate liposome attenuated cartilage damage. Scale bars, 100 μ m. (B) Severity of articular cartilage degradation was graded using Mankin scoring system. Graphs represent mean \pm SD (n=8). $*=p<0.05$. (C-E)The percentage of COL10 (C), DIPEN (D), and NITEGE (E)- positive cells per knee section were counted. Graphs represent mean \pm SD (n=6). $*=p<0.05$. PBSL: PBS liposome; CL: Clodronate liposome. Saf-O: Safranin O and fast green staining; MT: medial tibia.

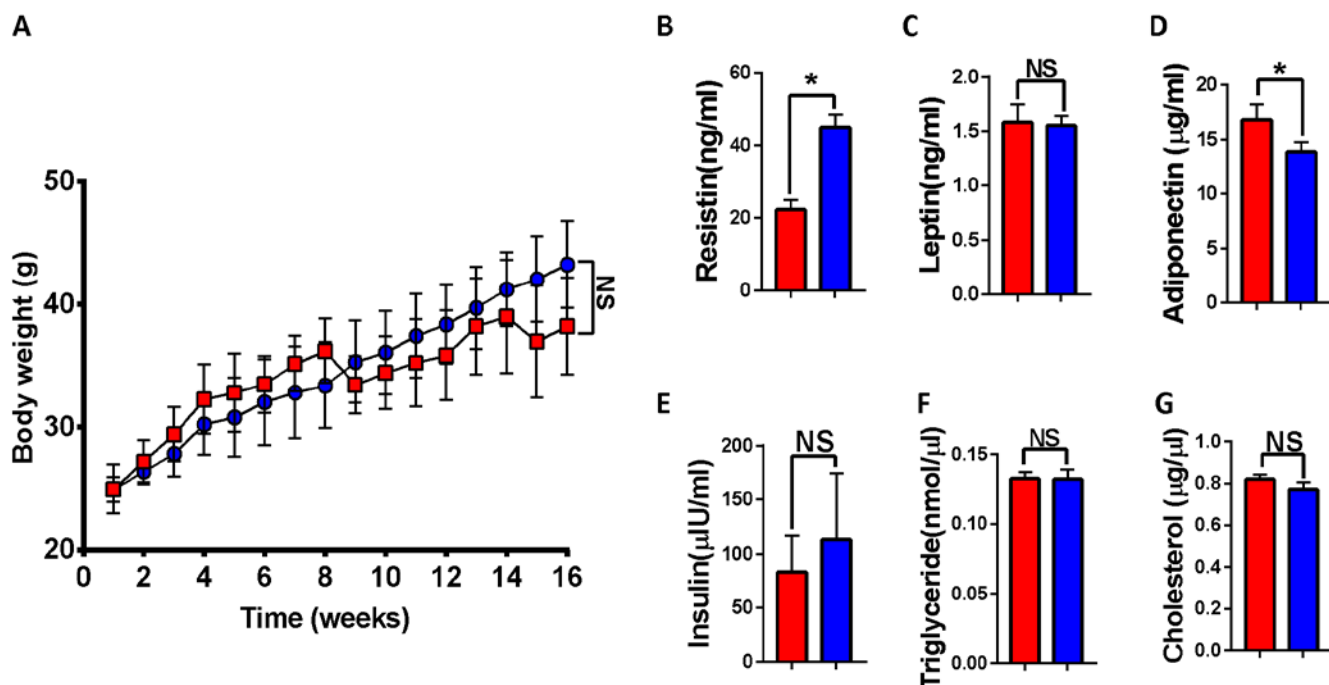
Supplementary Figure 2



Supplementary Figure 2 : Local treatment of Clodronate liposome does not affect bodyweight but altered metabolic parameters. (A) Body weight of HFD+CL or HFD mice were monitored over 16 weeks. (B-J) Effect of CL on metabolic parameters. Measurement of serum resistin (B), leptin (C), adiponectin (D), insulin (E), triglyceride (G) and total cholesterol (H). Graphs represent mean \pm SD (n=5). $*=p<0.05$. HFD, High-fat diet-fed mice; CL, Clodronate liposome.

Supplementary Figure 3

■ HFD+RvD1 ■ HFD



Supplementary Figure 3 Legend: Local treatment of resolvin D1 does not affect bodyweight but altered metabolic parameters. (A) Body weight of HFD+RvD1 or HFD mice were monitored over 16 weeks. (B-J) Effect of RvD1 on metabolic parameters. Measurement of serum resistin (B), leptin (C), adiponectin (D), insulin (E), triglyceride (G) and total cholesterol (H). Graphs represent mean \pm SD (n=5). *= $p < 0.05$. HFD, High-fat diet-fed mice; RvD1, resolvin D1.