



中國醫藥大學
China Medical University

Adipokines in Arthritic Diseases: Exploring Molecular Mechanisms and Therapeutic Implications

Department of Pharmacology, School of Medicine,
China Medical University

Professor Chih-Hsin Tang (湯智昕), Ph.D.

Publications

486

Total

From 1955 to 2024

Citing Articles

10,524

Total

10,143

Without self-citations

Times Cited

14,864

Total

12,217

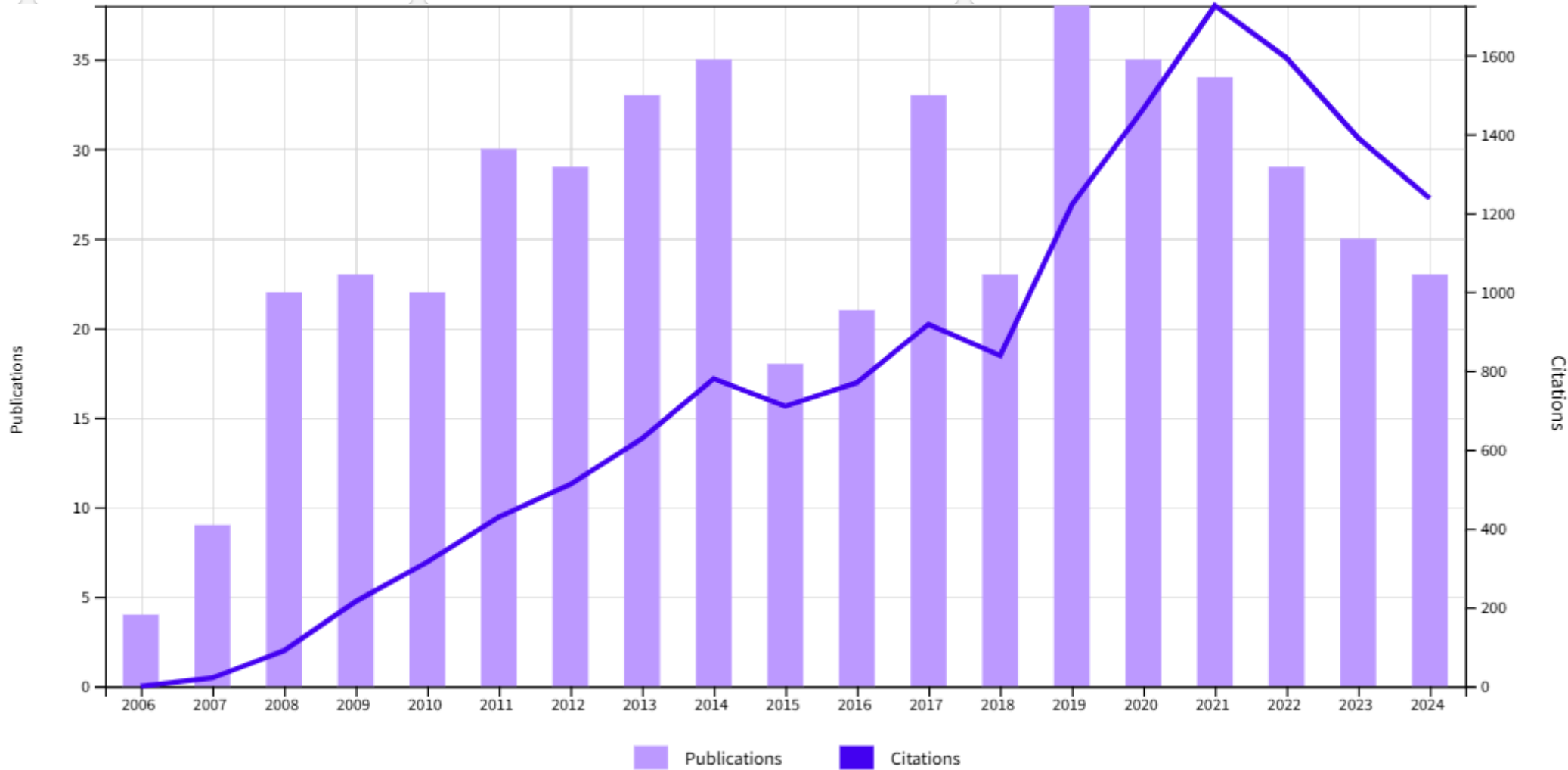
Without self-citations

30.58

Average per item

62

H-Index



Home / Best Scientists - Biology and Biochemistry / Chih-Hsin Tang



Chih-Hsin Tang

📍 China Medical University
Taiwan



D-Index & Metrics

Discipline name	D-index	Citations	Publications	World Ranking	National Ranking
Medicine	74	17,020	429	15321	33
Biology and Biochemistry	74	17,011	427	3562	14

Dear Chihhsin,

Happy New Year!

As we start 2024 our team at Research.com is excited to share with you our accomplishments from last year and share some of our plans for the future.

2023 was a busy year for our team as we:

- Introduced the first edition of our ranking of US colleges and universities aimed at students: <https://research.com/best-colleges>
- Released the latest edition of our best scientist ranking in the world: <https://research.com/scientists-rankings/best-scientists>
- Released the latest edition of our ranking of best universities in the world: <https://research.com/university-rankings/best-global-universities>
- Released the 2023 edition of our widely appreciated rankings of best female scientists: <https://research.com/scientists-rankings/best-female-scientists>
- Released the new edition of our unique rising stars of science ranking: <https://research.com/scientists-rankings/rising-stars>

Here are also some rankings related to your work that you may have missed:

- Your personal profile: <https://research.com/u/chih-hsin-tang>
- The profile of China Medical University: <https://research.com/university/biology-and-biochemistry/china-medical-university>
- Ranking of best scientists from Taiwan: <https://research.com/scientists-rankings/best-scientists/tw>
- Ranking of best scientists in Biology and Biochemistry: <https://research.com/scientists-rankings/biology-and-biochemistry>

In 2024 we plan to focus on maintaining the quality, and consistency of our data, and to improve the user experience on our platform even further. If there are any suggestions that you have, or some features you would like to see added in the future, feel free to share your ideas with us!

Thank you for being with us and helping us improve the scientific community.

2021,2022,2023,2024 Scopus
「全球前 2% 頂尖科學家」

2023全球前 2% 科學家公布 台灣臨床醫學者領域
(Clinic Medicine field)



國內排名 (2023)	全球排名 (2023)	國內排名 (2022)	全球排名 (2022)	姓名	單位	學門
1	4,513	1	6,529	陳亮恭	北榮	高齡醫學
2	6,063	4	8,184	Ivy Shiue*	國衛院	公共衛生
3	8,660	6	10,938	鄭安理	台大	腫瘤醫學
4	10,176	7	13,604	楊志新	台大	腫瘤醫學
5	11,128	2	6,532	曾慶孝	台大	新陳代謝
6	13,179	3	7,390	陳建仁*	中研院	腫瘤醫學
7	14,469	5	9,685	高嘉宏	台大	胃腸肝膽
8	18,111	8	15,353	蔡世仁	北榮	精神醫學
9	18,223	27	35,717	楊泮池	台大	腫瘤醫學
10	18,348	10	17,131	洪明奇*	中醫大	腫瘤醫學
11	20,690	24	34,186	林宗瑩*	成大	健康照護
12	21,827	2022年未入前35名		梁廣義*	國衛院	精神醫學
13	23,166	19	30,480	杜裕康*	台大	公共衛生
14	24,153	12	21,624	柯志鴻	高醫	精神醫學
15	25,840	28	38,243	廖運範	長庚	胃腸肝膽
16	26,134	14	22,412	王署君	北榮	神經醫學
17	26,393	13	22,125	劉扶東*	中研院	免疫學
18	30,113	11	19,978	湯智昕*	中醫大	腫瘤醫學
19	31,327	18	28,195	王清貞	長庚	骨科
20	31,622	15	22,947	陳定信*	台大	胃腸肝膽
21	33,003	17	26,766	郭漢崇	慈濟	泌尿
22	34,086	29	38,602	林仁混*	台大	藥學
23	34,149	23	33,169	方嘉佑*	長庚	藥學
24	34,667	25	35,342	張美惠	台大	兒童醫學
25	36,178	22	32,370	高淑芬	台大	精神醫學
26	37,476	16	24,708	Thierry Burnouf *	北醫大	心臟循環
27	40,008	31	46,374	魏耀揮*	彰基	分子生物
28	40,516	30	41,221	伍焜玉*	中醫大	心臟循環
29	41,022	20	30,703	顏正芳	高醫	精神醫學
30	44,272	2022年未入前35名		高嘉鴻	中醫大	核子醫學
31	47,751	21	30,865	蘇冠賓	中醫大	精神醫學
32	56,982	2022年未入前35名		鍾景光*	中醫大	腫瘤醫學
33	59,891	2022年未入前35名		楊智偉	長庚	泌尿科
34	60,668	2022年未入前35名		郭昶甫	長庚	免疫風濕
35	60,763	32	47,594	劉俊人	台大	胃腸肝膽

2023-10-08 08:00 聯合報／記者沈能元／台北即時報導

Expertise in Osteoarthritis: @ Taiwan

Based on 622 eligible articles published since 2013

In each column, black bars show the relative amount of expertise for each place or person. Longer is better. For example, Chih-Hsin Tang equates to the top-rated expert in Osteoarthritis in Taiwan during the years 2013-2023.



Zebra Cards From the [House, MD](#) technical advisor
The perfect holiday gift for physicians **GET THE BOOK**

Country

Includes continents

- Worldwide
- Asia
- Taiwan

Region

Includes US states, etc.

- Taipei
- Taichung
- Kaohsiung
- Kaohsiung City
- Miscellaneous cities in Taiwan
- Tainan
- Hualien
- Hsinchu
- Taoyuan City
- Huwei, TW

City

Includes metro areas

- Taipei
- Taichung
- Kaohsiung
- Kaohsiung City
- Miscellaneous cities in Taiwan
- Tainan
- Hualien
- Hsinchu
- Taoyuan City
- Huwei, TW

Institution

Add your [Visit us](#) button • Details

- China Medical University
- Taipei Medical University
- National Taiwan University
- Chang Gung University and Hospital
- Miscellaneous institutions in Taipei [C](#)
- Miscellaneous institutions in Taichung [C](#)
- Miscellaneous institutions in Kaohsiung [C](#)
- Kaohsiung Medical University
- Miscellaneous institutions in Kaohsiung City [C](#)
- National Yang-Ming University
- National Cheng Kung University
- National Defense Medical Center
- Chang Gung University Kaohsiung
- Chung Shan Medical University
- Tri-Service General Hospital
- Tzu Chi University
- National Sun Yat-sen University
- Fu-Jen Catholic University
- Taichung Veterans General Hospital
- Taipei Veterans General Hospital
- Miscellaneous institutions in Tainan [C](#)
- Kaohsiung Veterans General Hospital
- Miscellaneous institutions in Hsinchu [C](#)

Expert

Add your [Consult me](#) button • Details

- Tang, Chih-Hsin
- Liou, T-H
- Liao, Chun-De
- Liu, Shan-Chi
- Tsai, Chun-Hao
- Chen, Hung-Chou
- Wang, Ching-Jen
- Huang, Shih-Wei
- Tu, M
- Chen, Carl P C
- Yang, Na
- Cheng, Jai-Hong
- Ko, Jih-Yang
- Kuo, Shu-Jui
- Hsu, Chih-Chin
- Lu, Tung-Wu
- Wang, Junwen
- Wang, Yingchun
- Chen, Jean-Lon
- Huang, Hsuan-Ti
- Chou, Shih-Hsiang
- Chiu, Y-S
- Chang, Y-C

寄件人	Brendan McAdams <brendan@expertscape.net>
日期	2021/07/13 13:07
收件人	chtang@mail.cmu.edu.tw;
副本	twtan@mail.cmu.edu.tw
主旨	Dr. Tang: World Expert in Chondrosarcoma

Dear Dr. Tang,

Expertscape's PubMed-based algorithms place you in the top 0.1% of scholars writing about Chondrosarcoma over the past 10 years, a level we label as "World Expert."

Thus, as part of our regular "Daily Experts" announcements to recognize world experts like you, Expertscape plans to tweet the following on Twitter this Thursday, July 15, 2021 (New York time):

In keeping with Sarcoma and Bone Cancer Awareness Month (July 2021), congratulations to Dr. Chih-Hsin Tang of China Medical University --
Recognized as an Expertscape World Expert in Chondrosarcoma.
<https://expertscape.com/ex/chondrosarcoma>

To correct your name or institution, or to add your personal Twitter handle, or to opt out, we invite you to complete the simple form at:

https://www.expertscape.com/announce2/L_ZACuPaQdqe1rVOX8YSIA

Kudos to you! Reaching this level of expertise is a tremendous achievement, and we are proud to share your professional accomplishments with the world.

Congratulations,

Brendan McAdams & John Sotos, MD
expertscape.com - @ExpertscapeNews - @Daily_Experts

**Rheumatoid arthritis (RA)
Osteoarthritis (OA)**

osteoclast

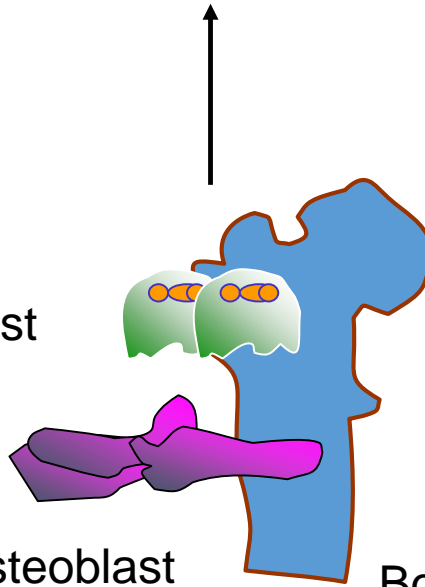
osteoblast

Bone

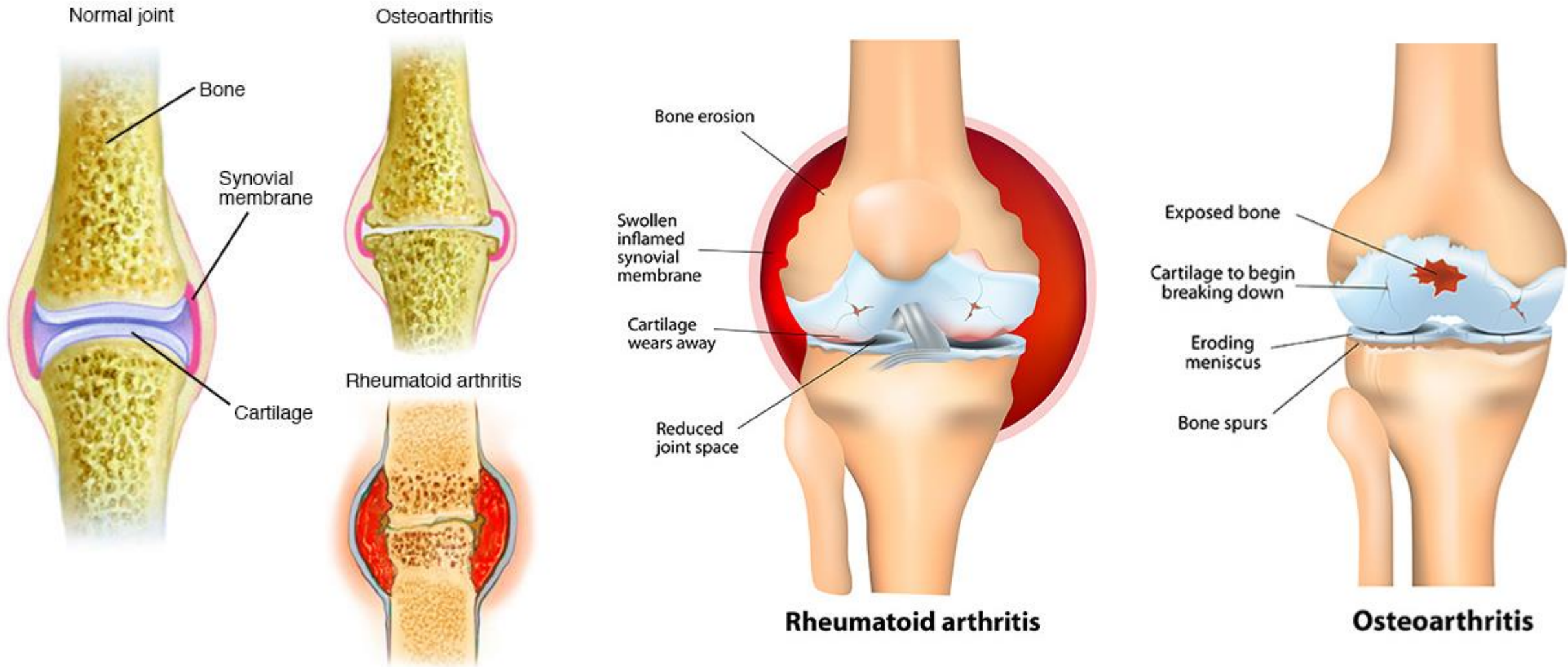
Osteoporosis

**Osteosarcoma
Chondrosarcoma**

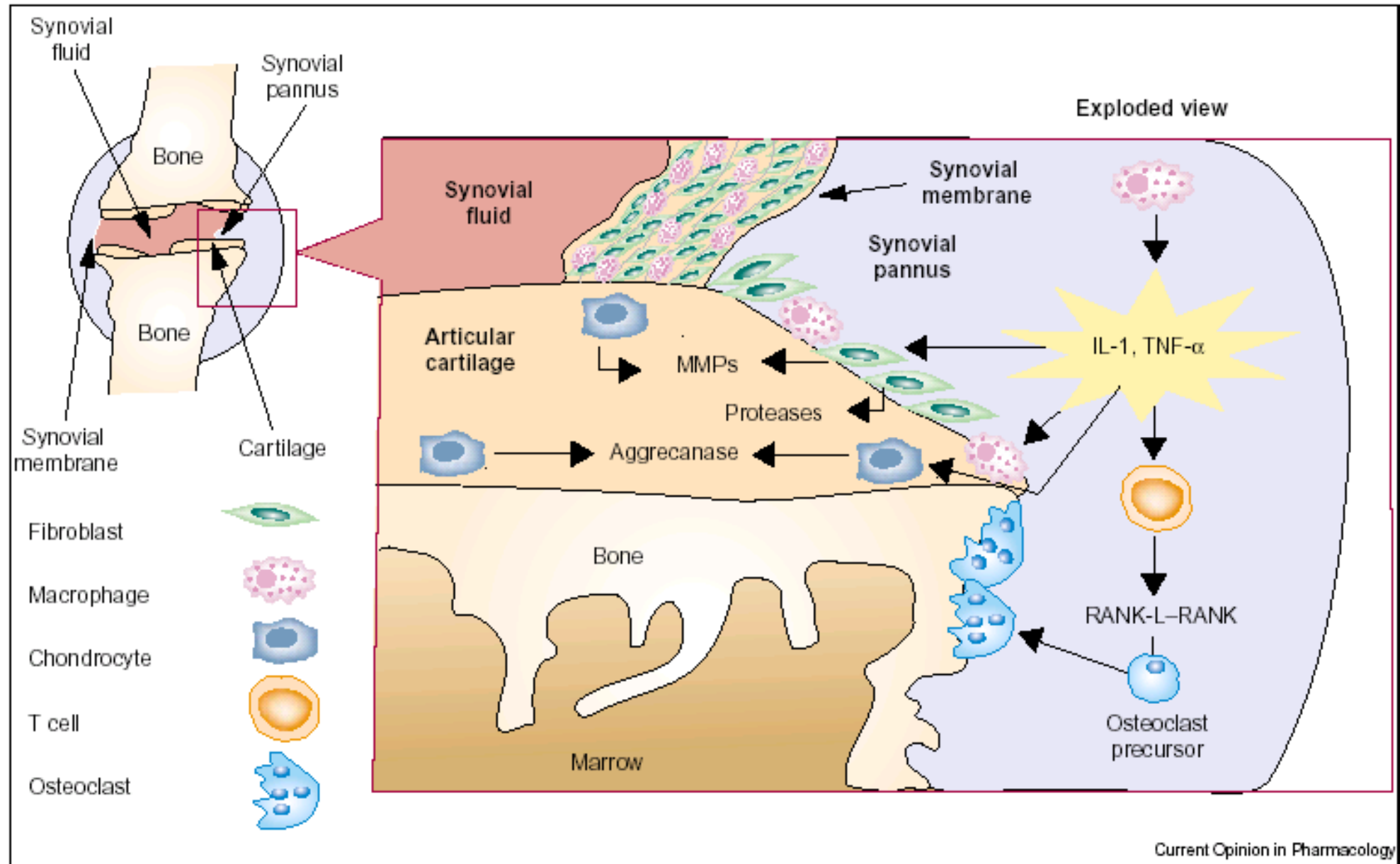
**Tumor metastasis
to Bone**

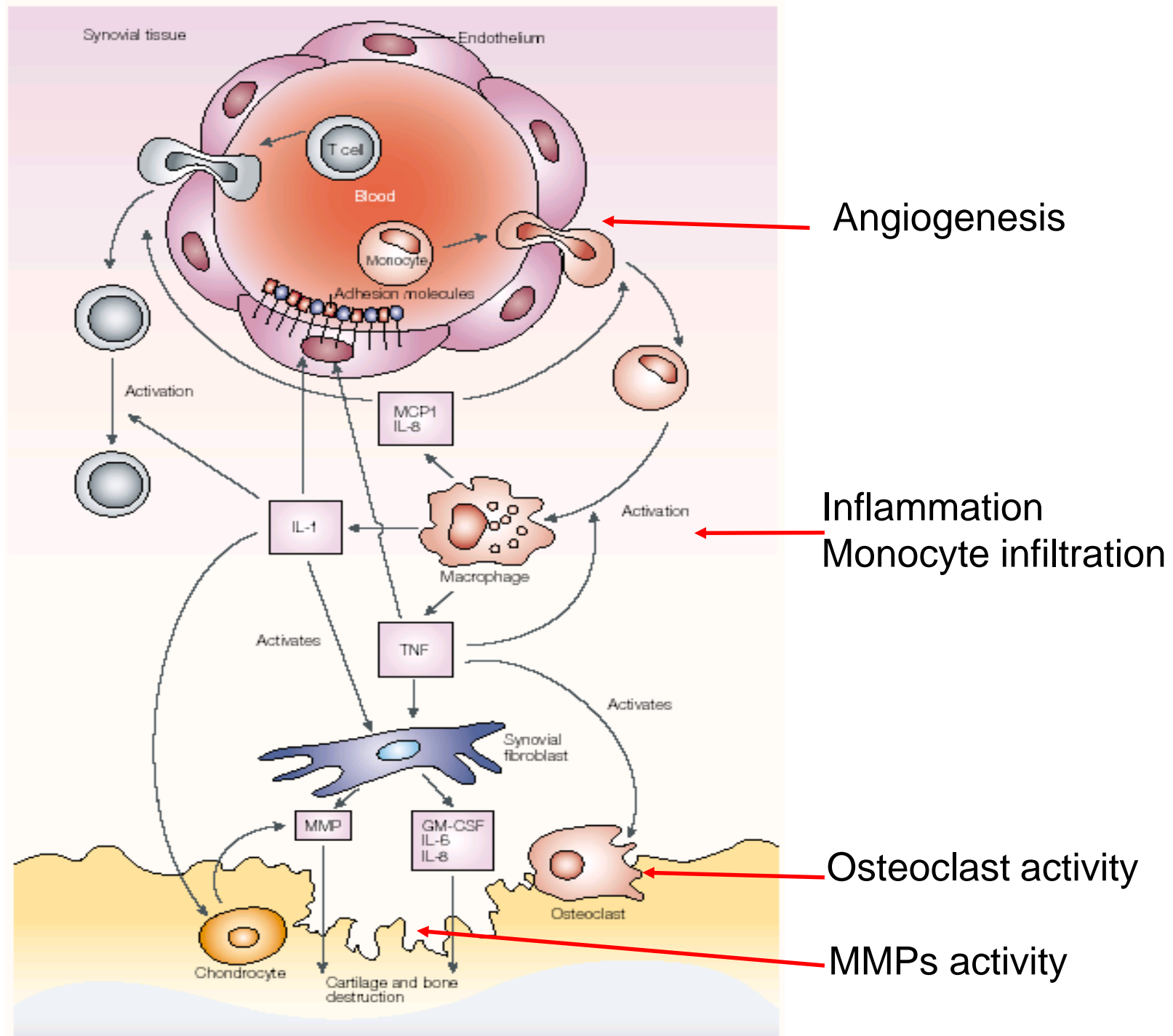


Arthritis



Arthritis





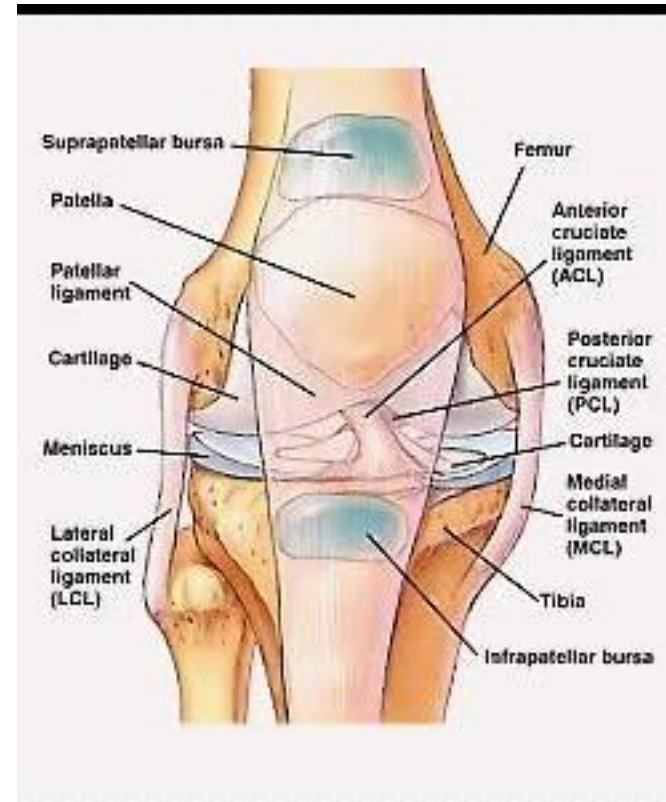
Common treatment

RA	OA
NSAIDs	NSAIDs
Glucocorticodes	Glucocorticodes

Different treatment

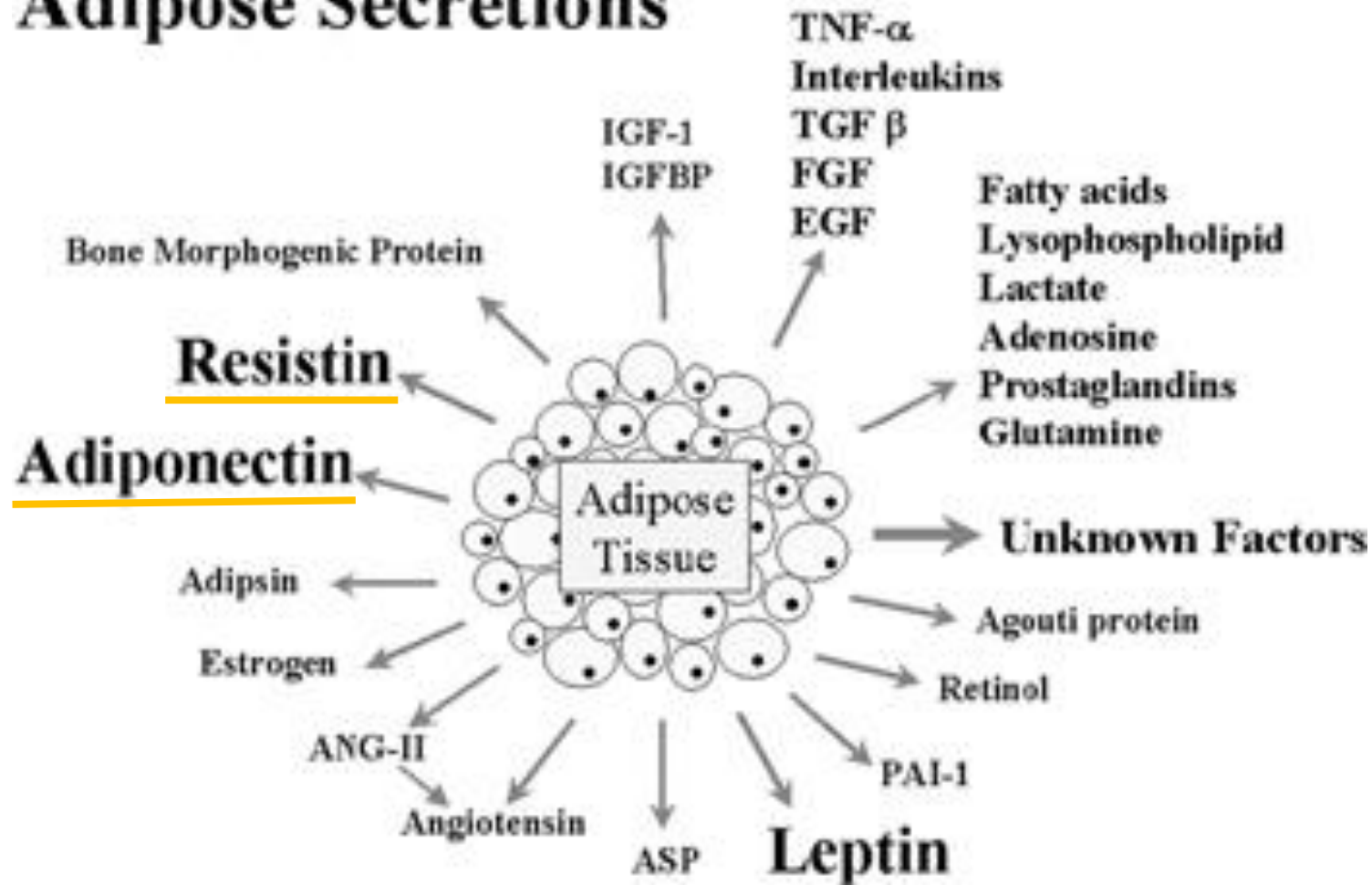
DMARDs	Glucosamine
Biologic agents	Hyaluronic acid

Obesity

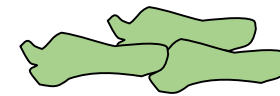


Adipokines

Adipose Secretions



Human primary cell cultures

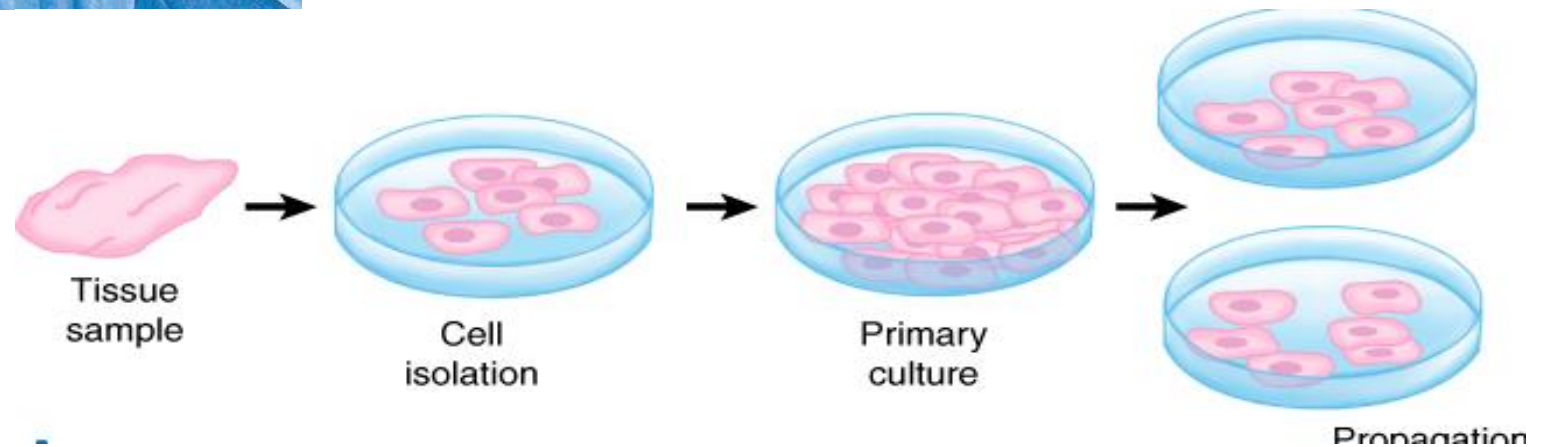


Osteoblasts



Synovial
fibroblasts

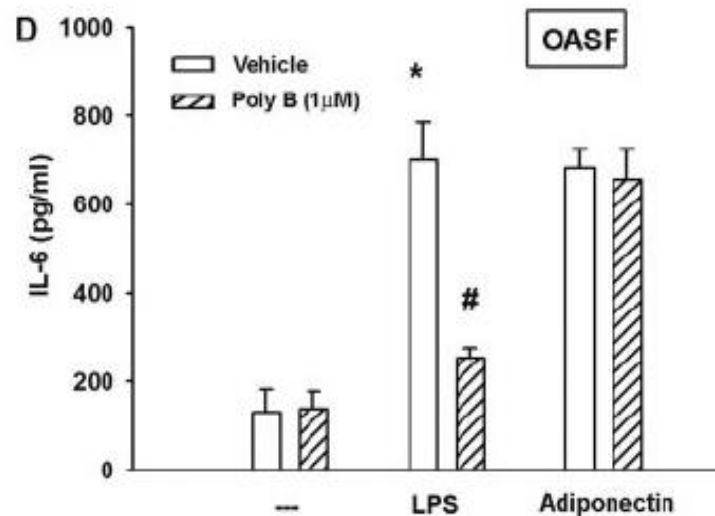
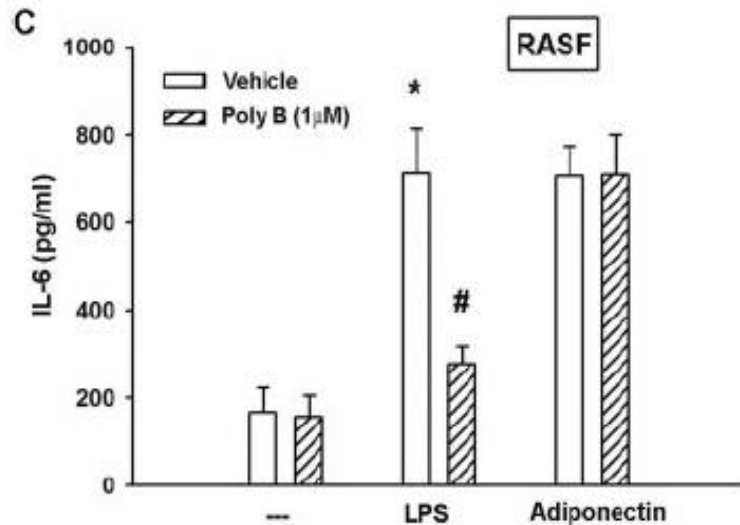
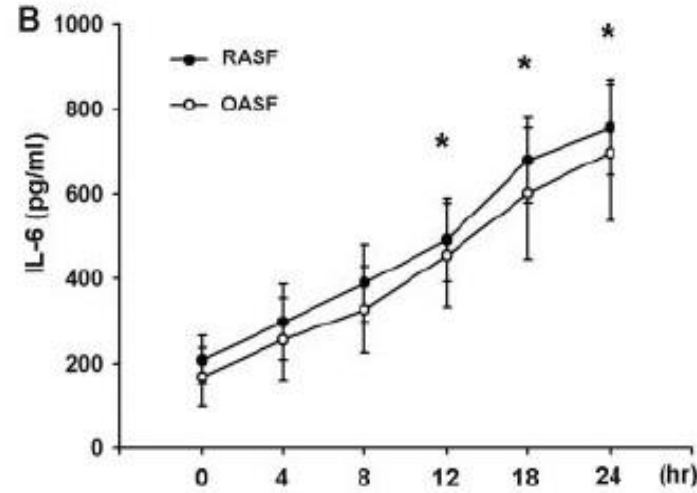
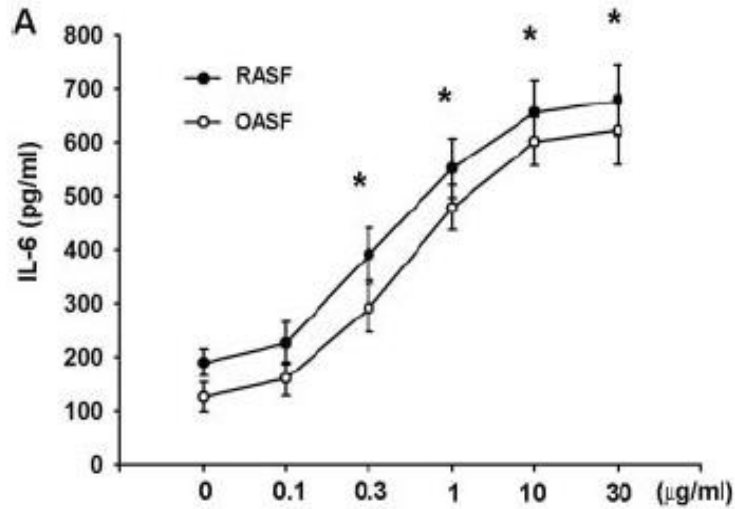
RA; OA; Normal



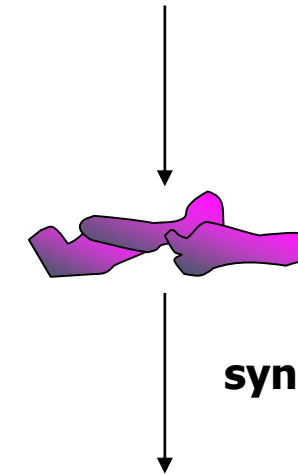
Adiponectin increases IL-6 expression in human synovial fibroblasts



Tang Chih-Hsin

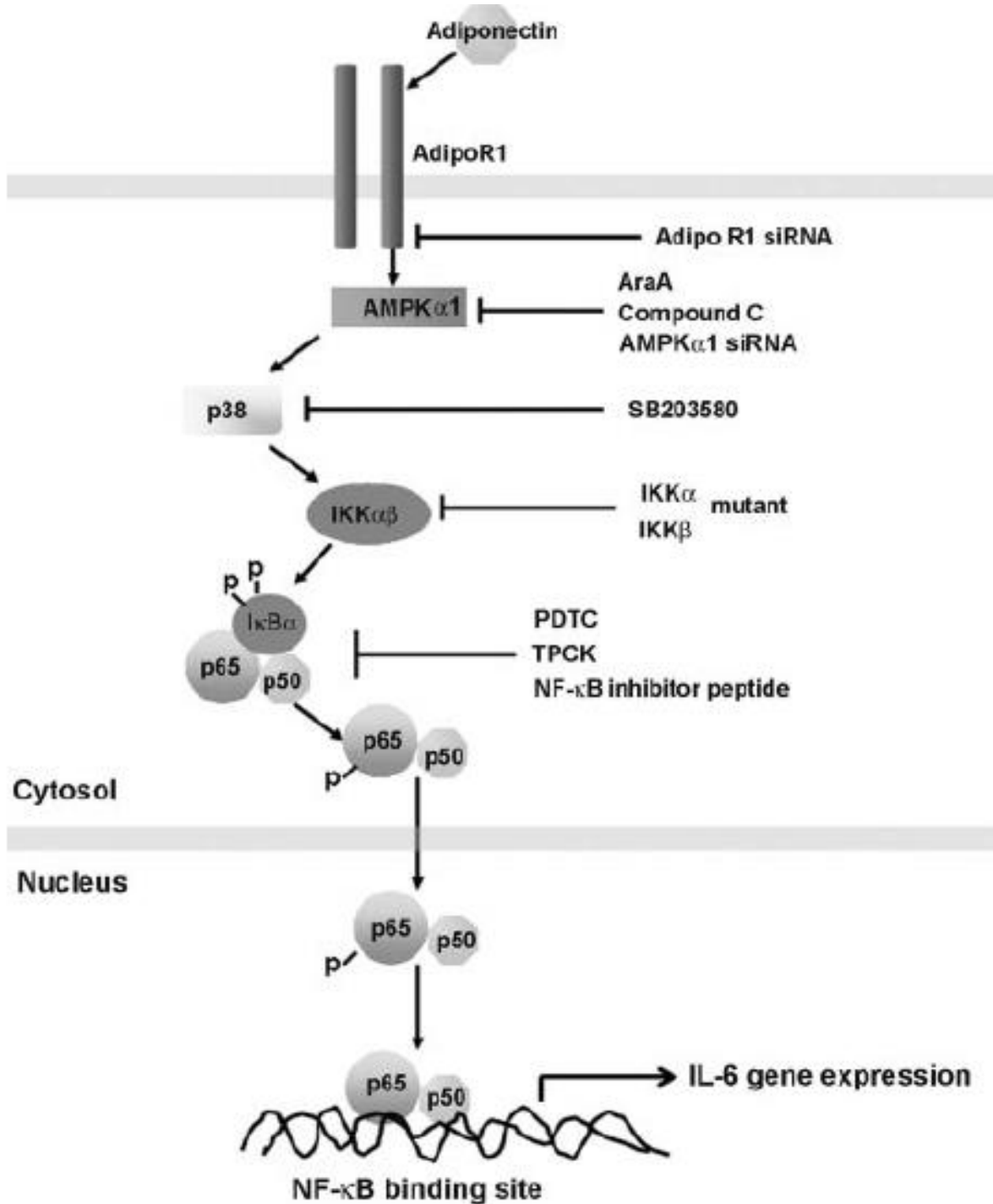


Adiponectin



synovial fibroblasts

**Inflammatory cytokine;
IL-6 expression**



Adipokines (Adiponectin; Leptin; Resistin...)

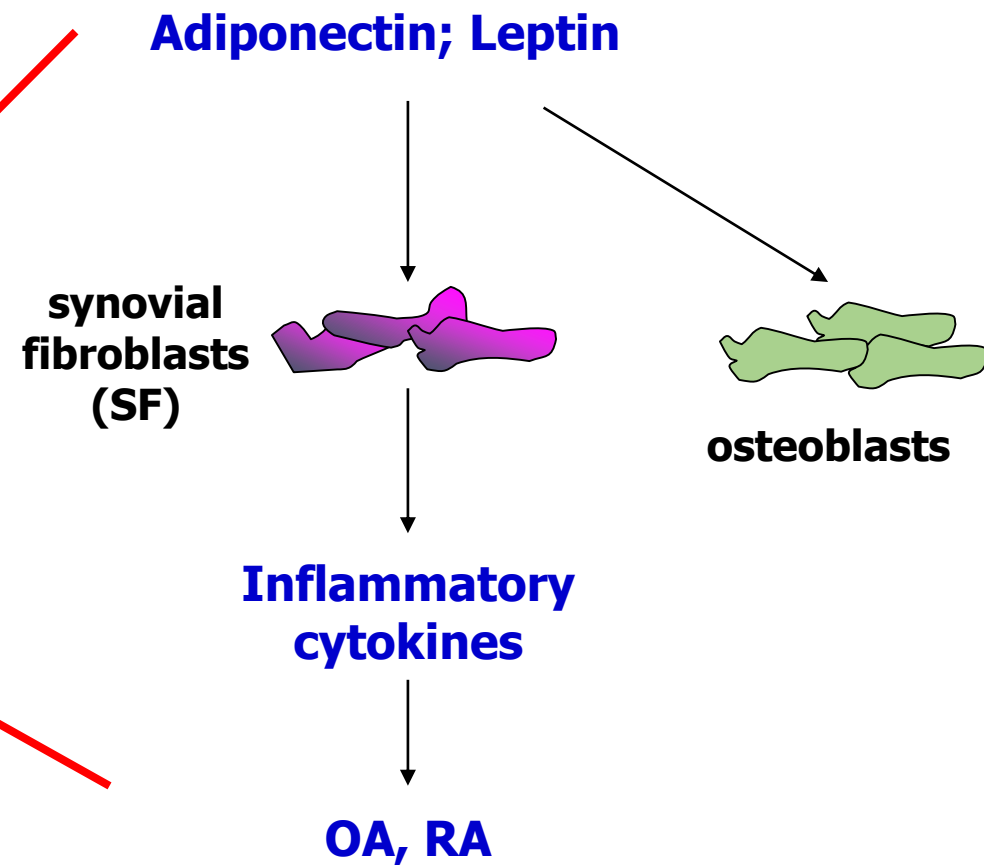
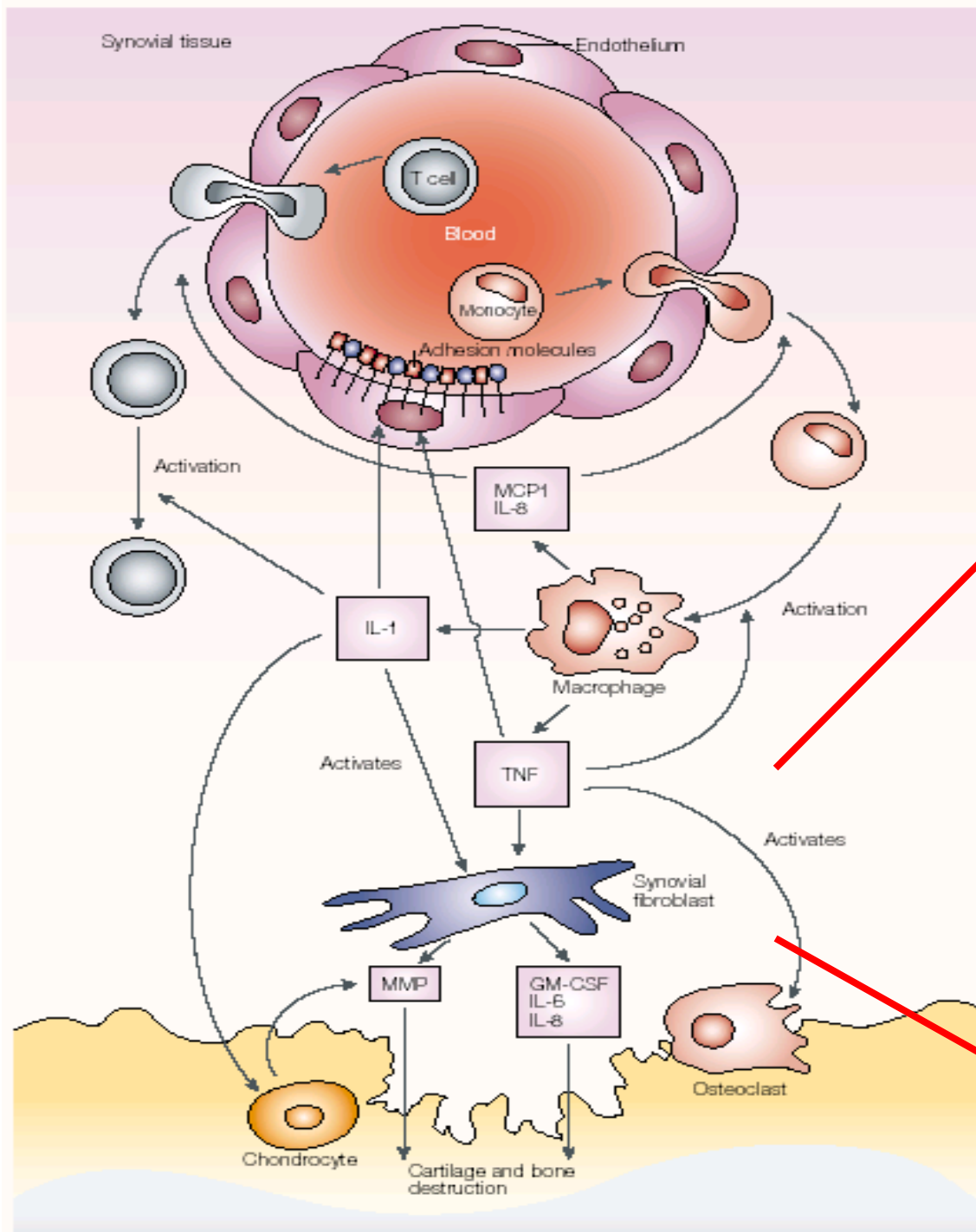


Cytokines (IL-1; IL-6; TNF...)

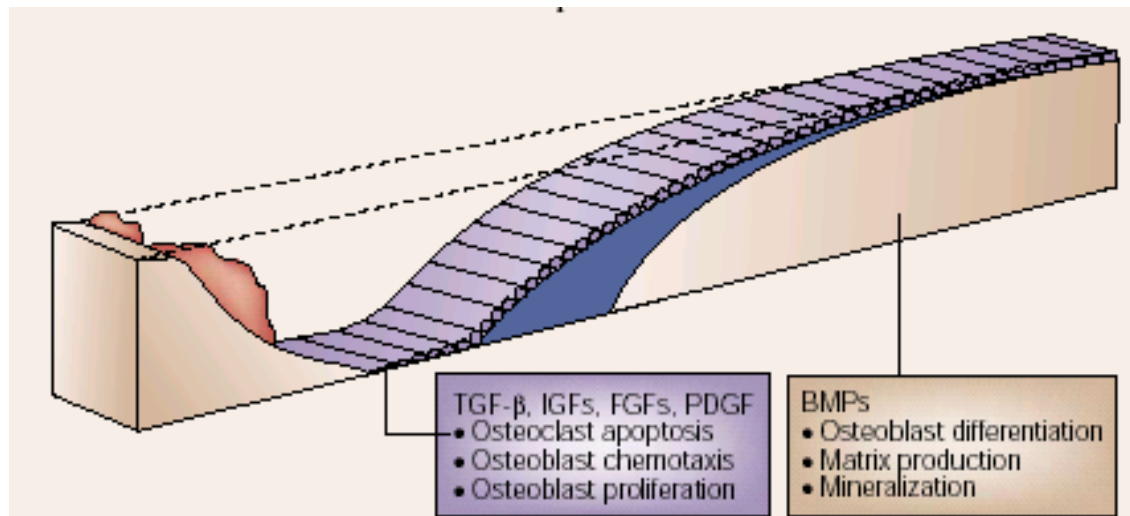
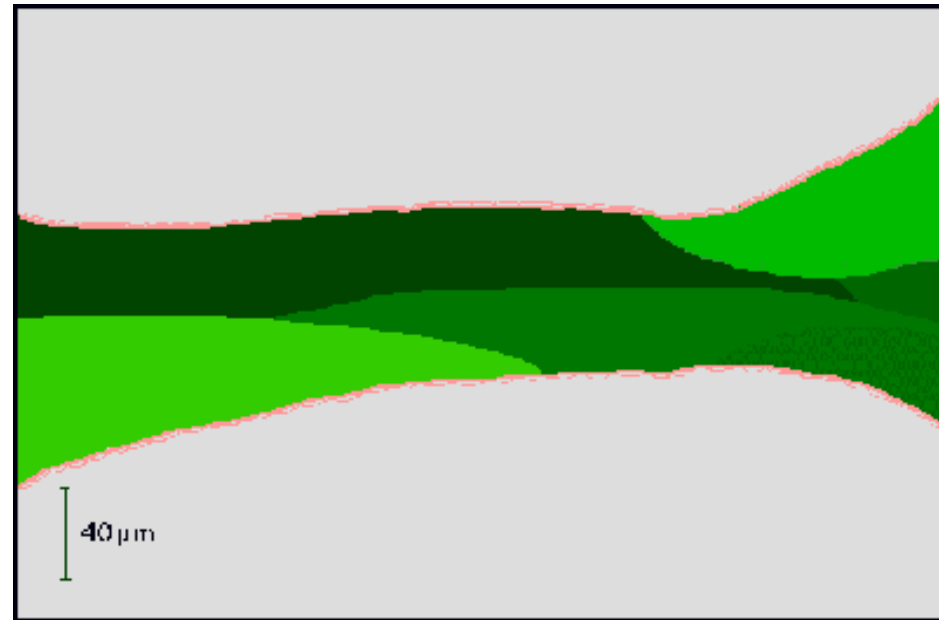


OA; RA

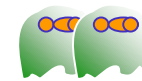
Leptin increases IL-6; *PLOS ONE* (2013)
Leptin increases IL-8; *Cell Signaling* (2008)



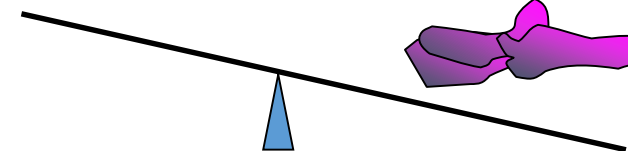
Bone remodeling



Osteoclast

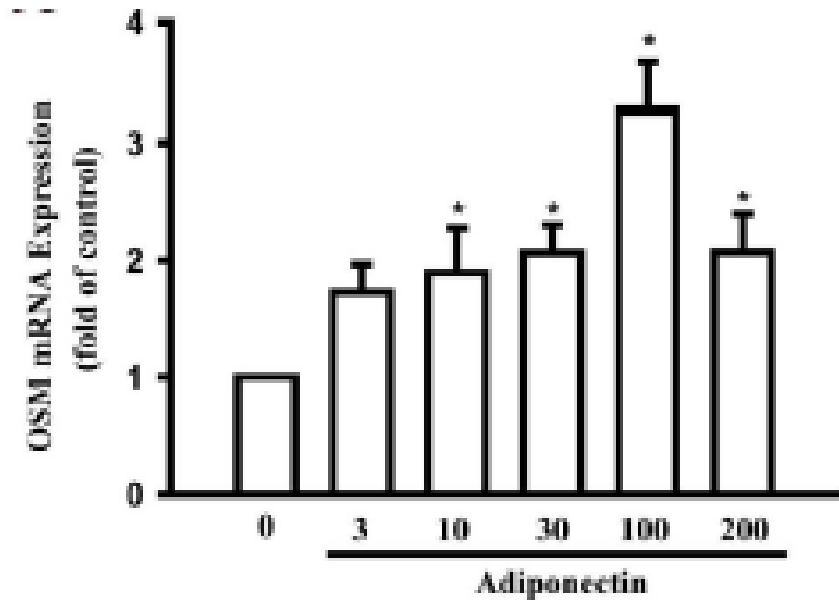


Osteoblast



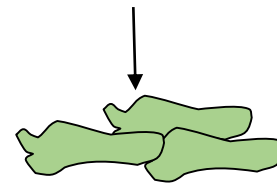
Unbalance --- osteoporosis

Adiponectin increases OSM expression in osteoblasts



Su Chen-Ming

Adiponectin



osteoblasts

**Inflammatory
cytokines**

Arthritis Rheum; J Immunol (2016)

DBA/1J mice



Day 0 :
First immunization with Typell
Collagen in CFA

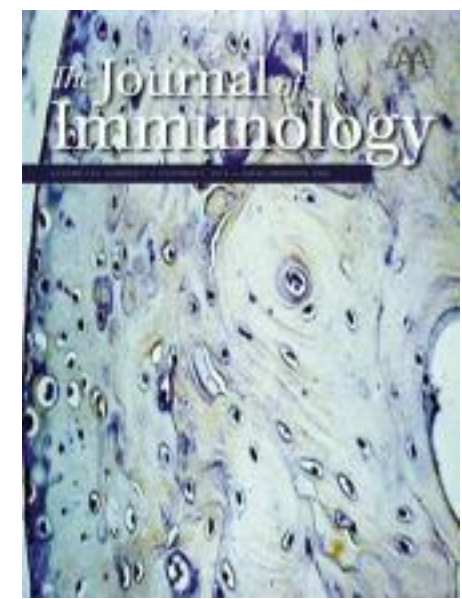


Day 21 :
Second immunization with
Typell Collagen in IFA



shNesfatin-1

Therapeutic treatment
starts after arthritis onset



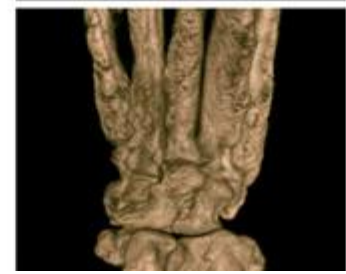
Control-shRNA



Control-shAD



CIA+Control-shRNA

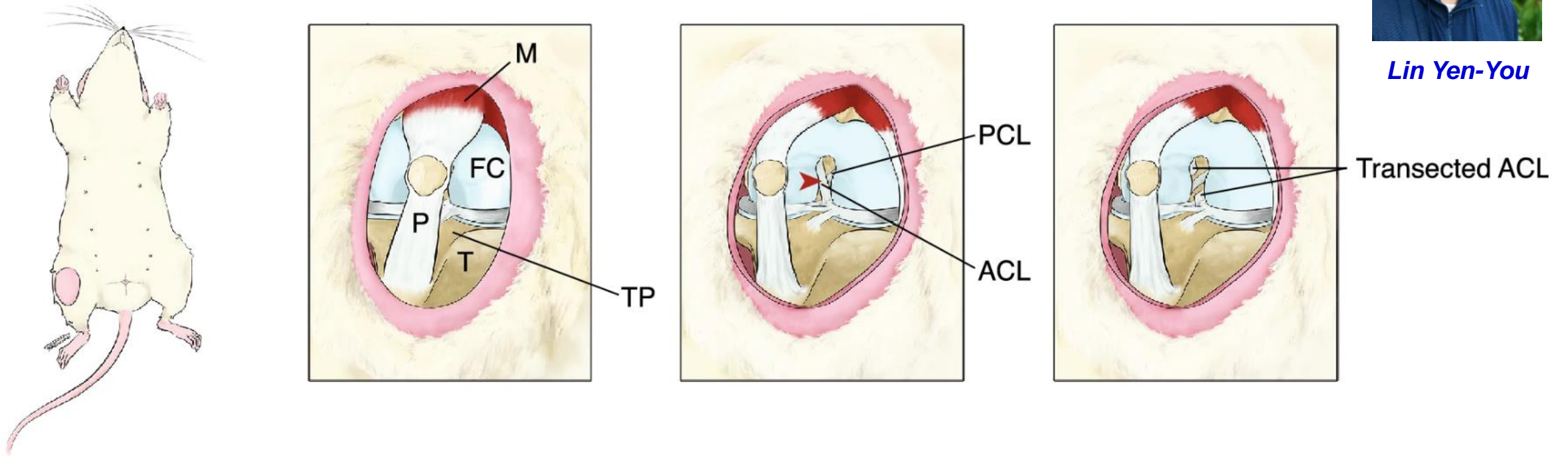


CIA+Control-shAD



OA animal model

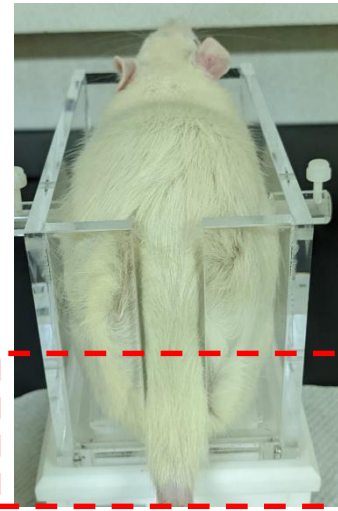
- **Anterior Cruciate Ligament Transection (ACLT) rat model**



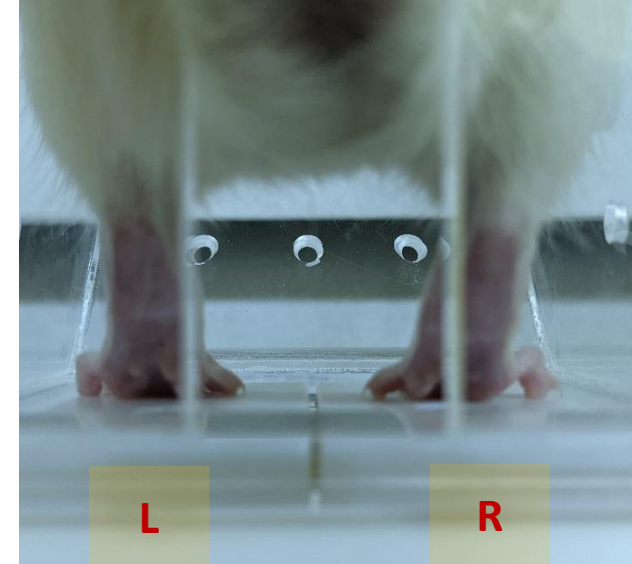
Lin Yen-You

ACL anterior cruciate ligament, FC femoral condyle, M quadriceps femoris muscle, P patellar tendon, PCL posterior cruciate ligament, T Tibia, TP tibial plateau.

OA model weight-bearing testing



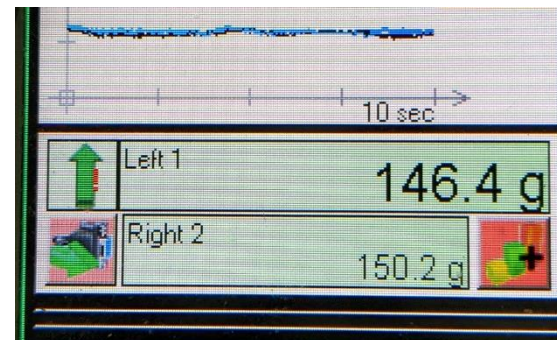
checked



1. Rat needs to be stable in the plastic box
2. 10-second test time
3. Each hind paw on each test sensor
4. Each rat repeat detect 3-5 times and record the data

control

ACLT



Osteoarthritis (已公告)



Article

Hericium erinaceus Mycelium Ameliorates In Vivo Progression of Osteoarthritis

Shang-Yu Yang ^{1,†} , Chi-Jung Fang ^{2,†}, Yu-Wen Chen ³, Wan-Ping Chen ³, Li-Ya Lee ³, Chin-Chu Chen ^{4,5,6}, Yen-You Lin ⁷ , Shan-Chi Liu ⁸, Chun-Hao Tsai ^{9,10} , Wei-Chien Huang ^{11,12} , Yang-Chang Wu ^{13,14} and Chih-Hsin Tang ^{7,11,15,16,*}

Nutrients. 2022 23;14(13):2605



Article

Therapeutic Effects of Live *Lactobacillus plantarum* GKD7 in a Rat Model of Knee Osteoarthritis

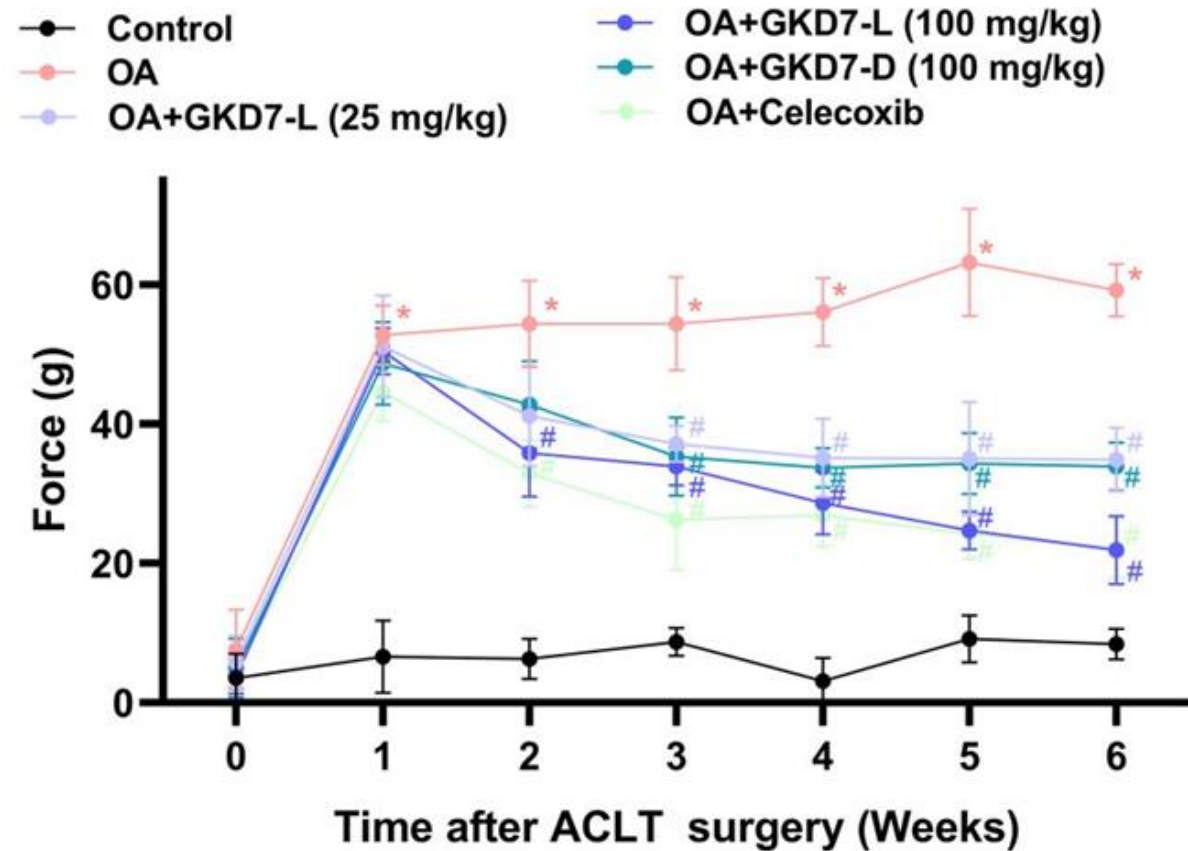
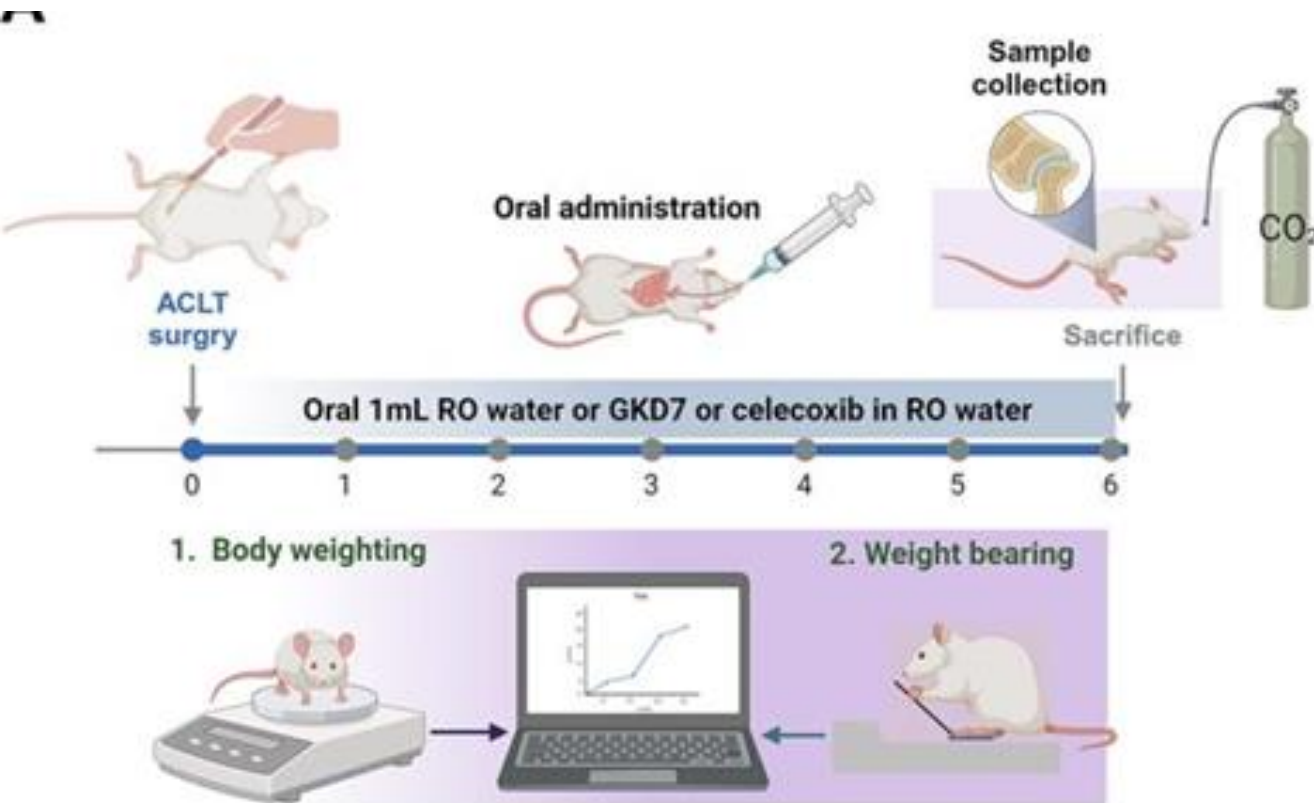
Yen-You Lin ^{1,†} , Sunny Li-Yun Chang ^{2,3,†}, Shan-Chi Liu ⁴, David Achudhan ² , You-Shan Tsai ⁵, Shih-Wei Lin ⁵, Yen-Lien Chen ⁵, Chin-Chu Chen ^{6,7,8}, Jun-Way Chang ⁹, Yi-Chin Fong ^{10,11}, Sung-Lin Hu ^{3,12,*} and Chih-Hsin Tang ^{1,2,3,13,14,*}

Probiotics
益生菌

Nutrients. 2022 1;14(15):3170

The joint protective function of live- and dead-*Lactobacillus plantarum* GKD7 on anterior cruciate ligament transection induces osteoarthritis

Yen-You Lin^{1,*}, Chih-Ying Wu^{2,3,*}, You-Shan Tsai⁴, Chin-Chu Chen^{4,5}, Tzu-Ching Chang¹, Li-Chai Chen⁶, Hsien-Te Chen^{7,8}, Chin-Jung Hsu^{8,9}, Chih-Hsin Tang^{1,10,11,12}



產學合作計畫 (University-Industry Collaboration Grants)

	主題	經費	期間
	抗退化性關節炎評估試驗	1,052,174	2021.6 – 2022.7
	以抗退化性關節炎動物試驗評估益生菌劑量、劑型之試驗	826,200	2022.5 – 2022.12
→	菌類素材對減緩退化性關節炎之機能探討	1,225,800	2023.4 – 2024.10
→	香草咖啡因萃取物對抗發炎試驗之評估	234,783	2023.10 – 2024.09
→	探討減緩退化性關節炎之配方素材機制	1,803,600	2023.12 – 2026.5

退化性關節炎臨床試驗

總經費 12,000,000

國科會補助學研單位 2,300,000

2023.04.01~2024.03.31

Dr. Chun-Han Tsai

Dr. Chien-Chung Huang

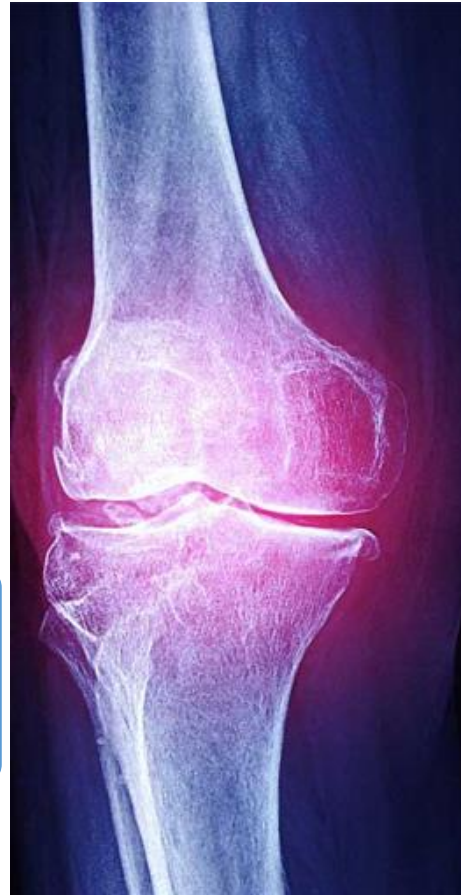
Dr. Chih-Yuan Ko

B11201

計劃結束收滿80人

X ray判讀、WOMAC
指數與VAS指數評估

完成4項安全性指標



國家科學及技術委員會新竹科學園區管理局

112 年度精準健康跨域推升計畫

酪酸菌精準應用於退化性關節炎之臨床研究

申請機構：葡萄王生技股份有限公司龍潭園區分公司

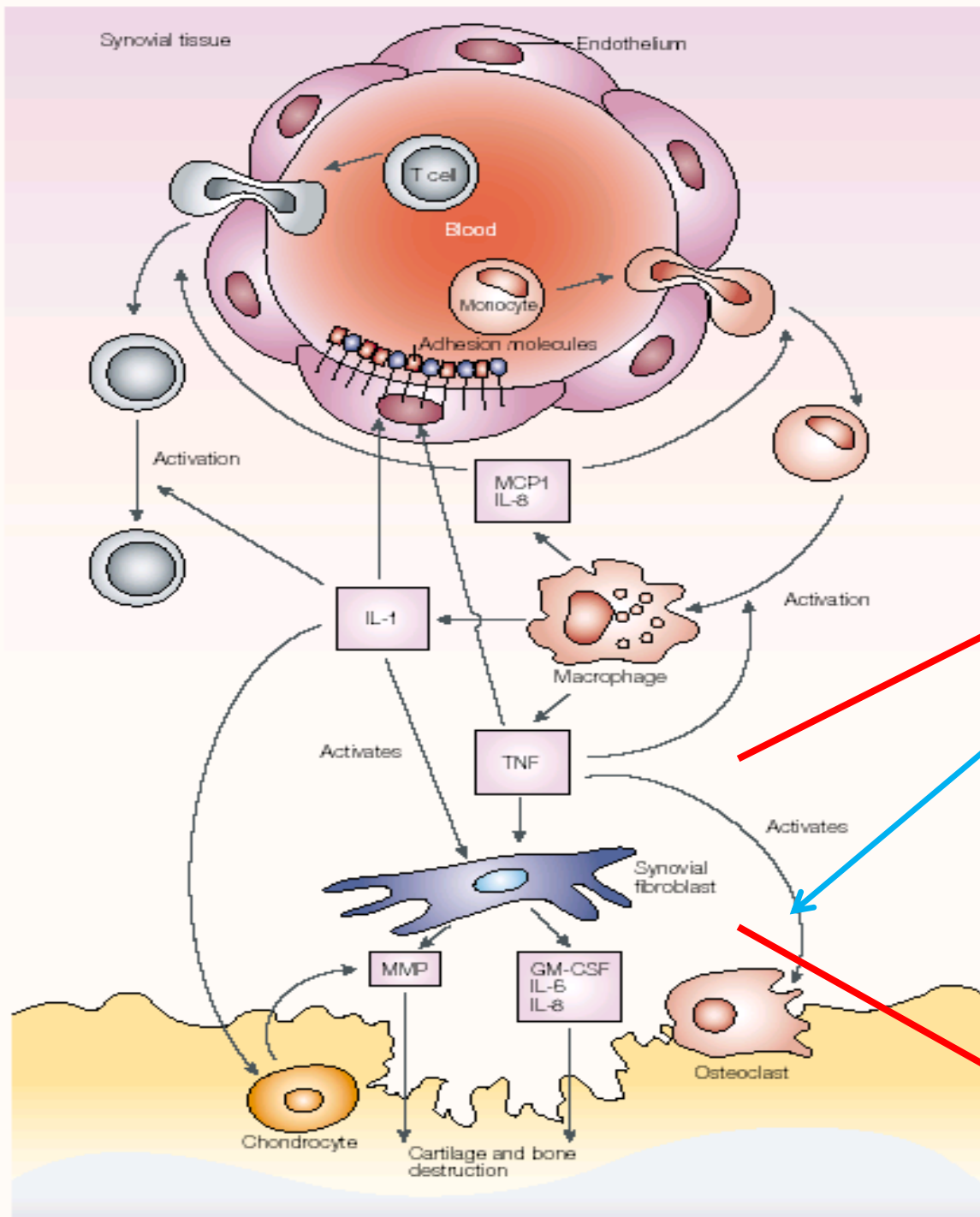
學研機構：中國醫藥大學

計畫總主持人：陳勁初

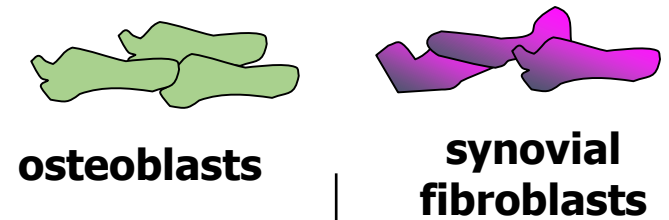
學研機構主持人：湯智昕



Osteoarthritis (已公告)

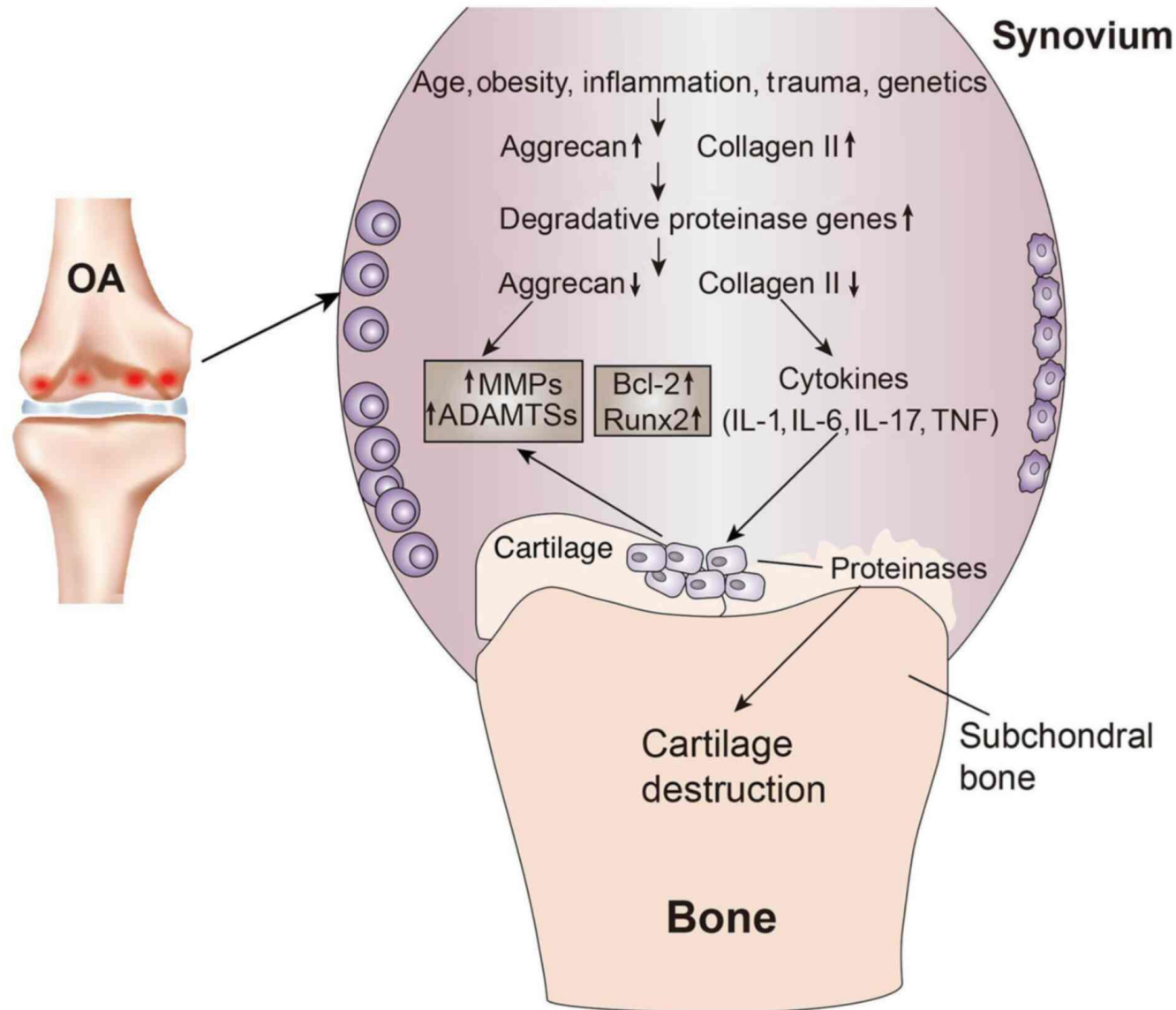


Adiponectin; Leptin

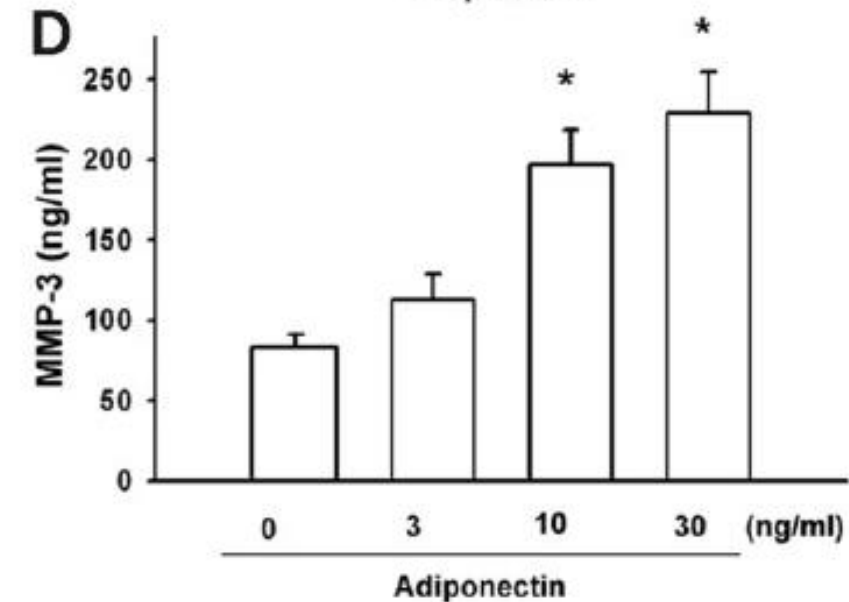
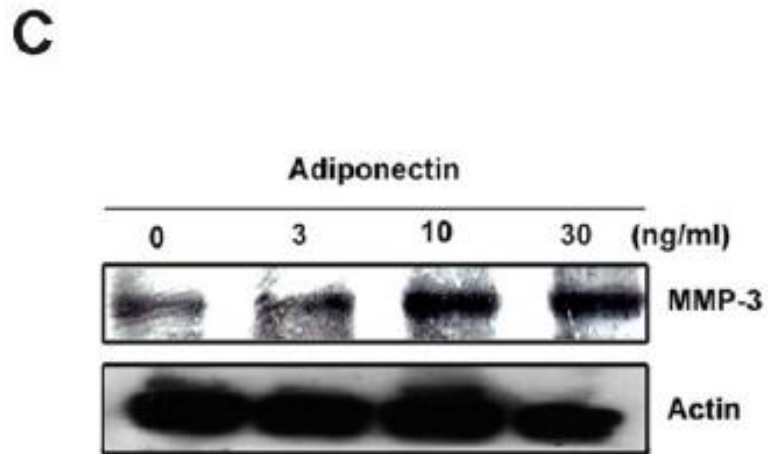
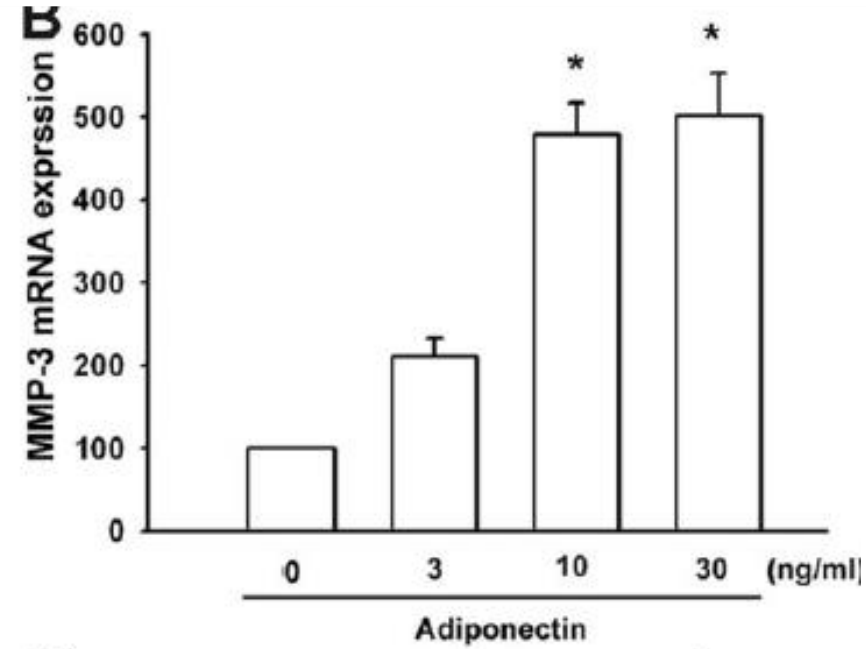
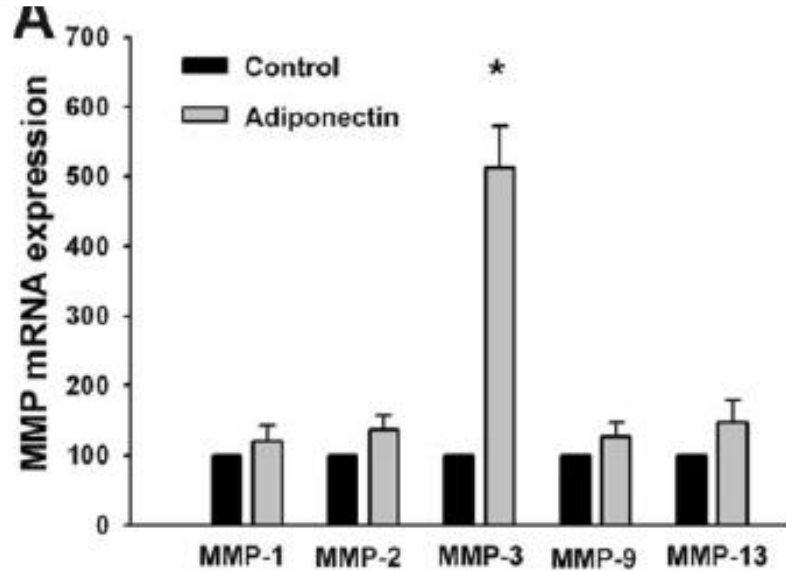


Inflammatory cytokines

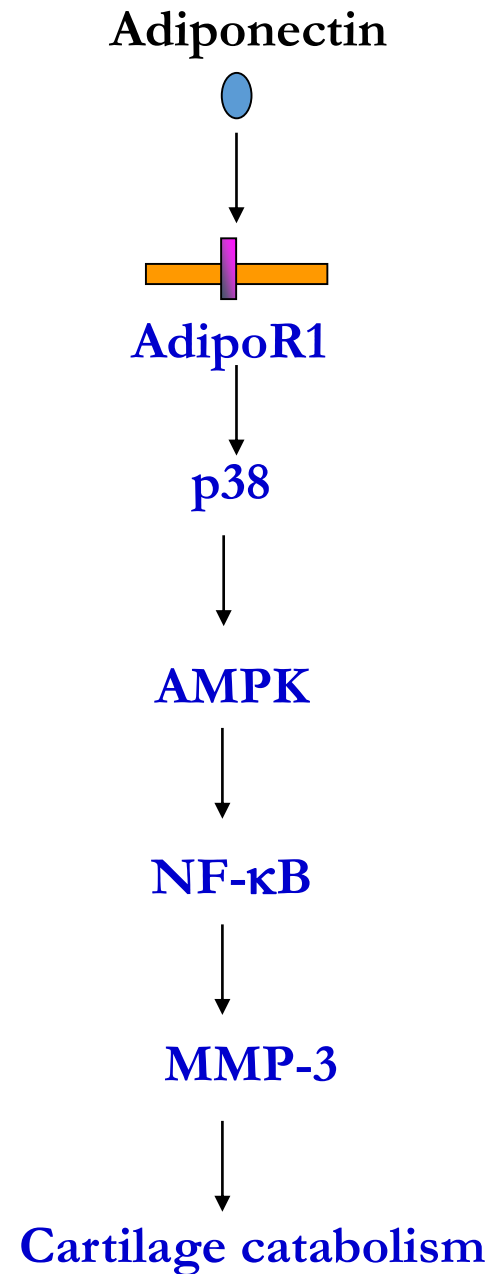
The chondrocytes in arthritic pathogenesis



Adiponectin induces MMP-3 expression in human chondrocytes

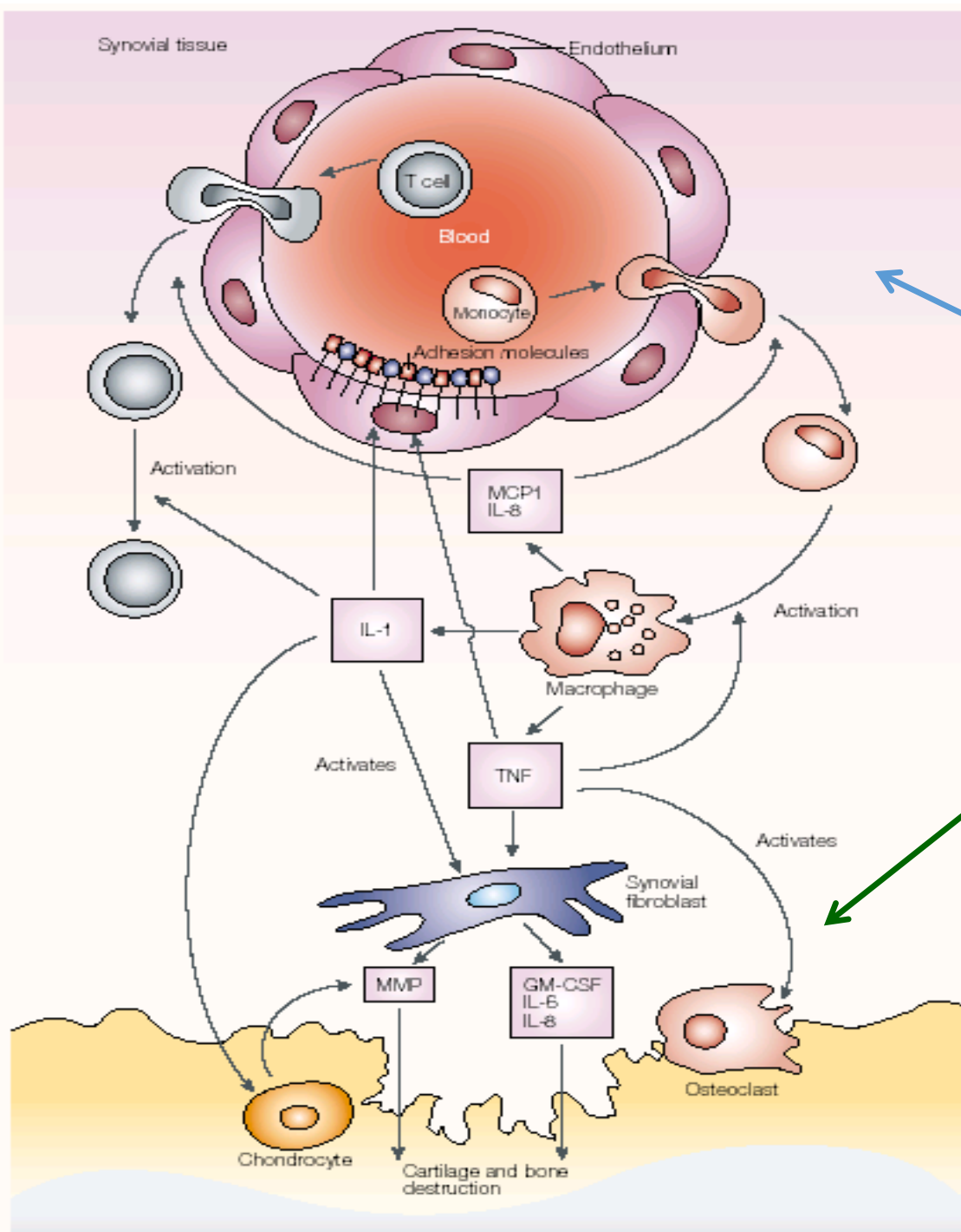


Lin Chih-Yang



Leptin increases MMP-13 in chondrocytes
Mediators Inflamm (2016)

J Cell Biochem. 2011 112(5):1431-40



**Adipokines (Adiponectin;
Leptin; Resistin...)**



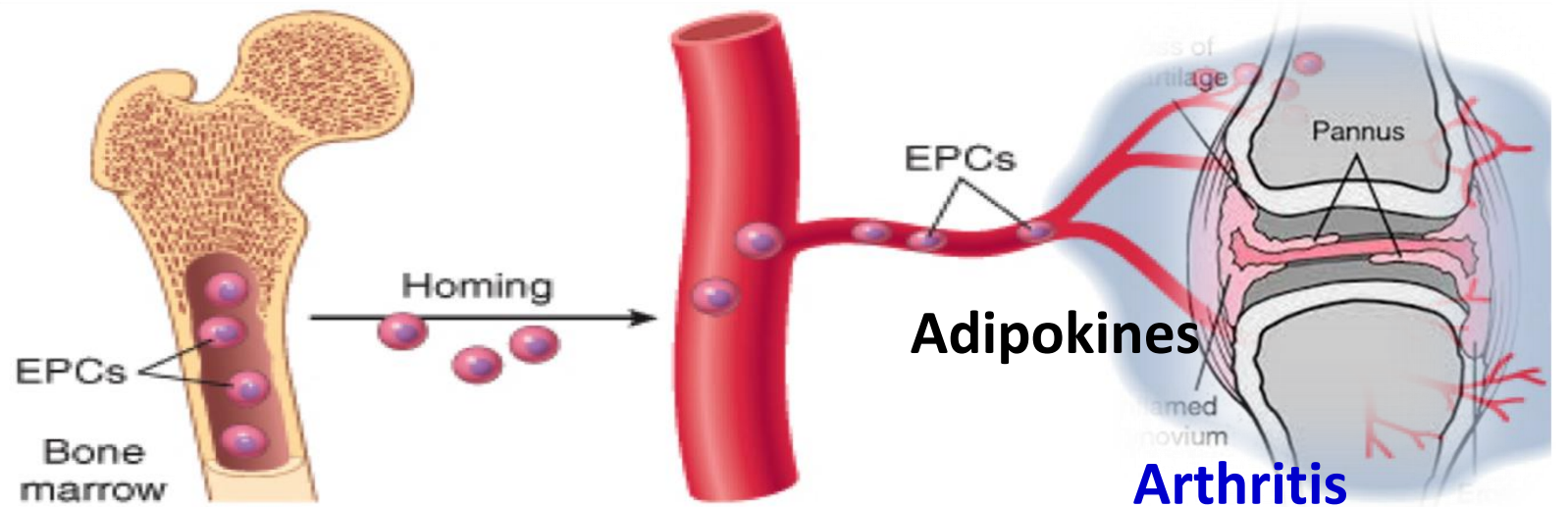
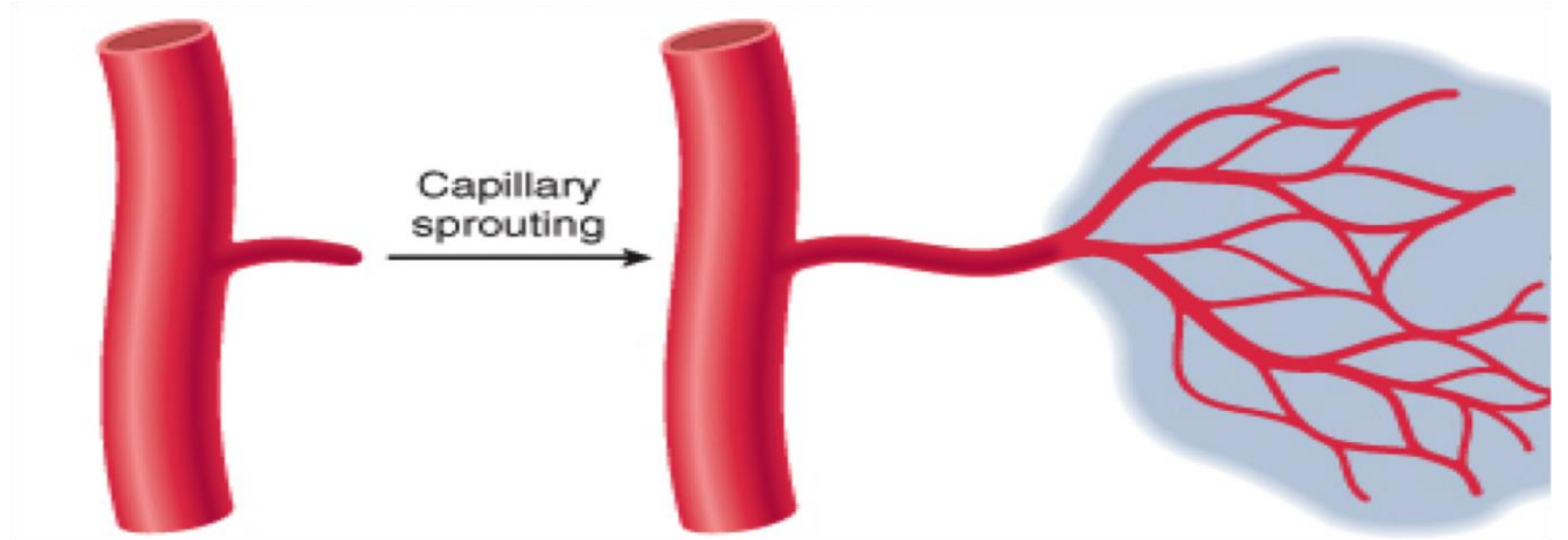
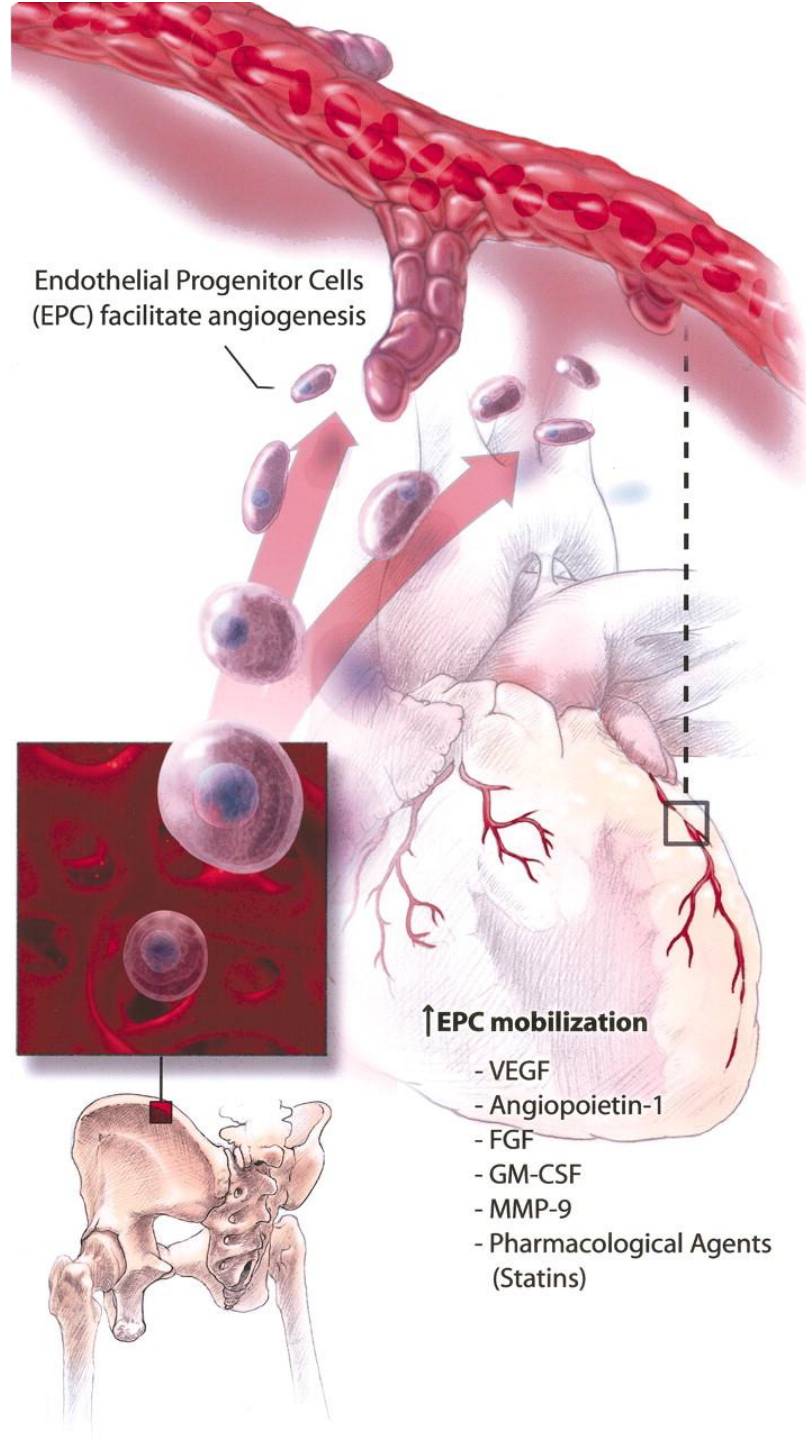
osteoblasts



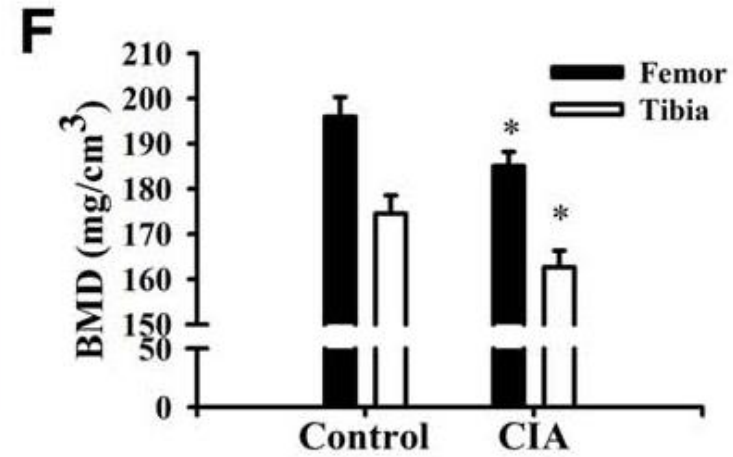
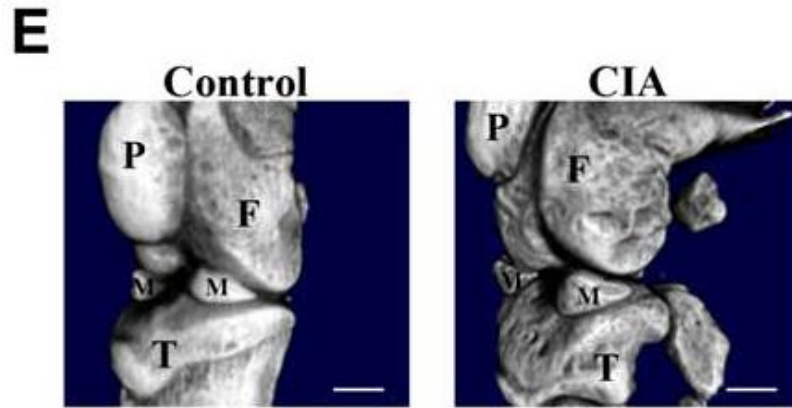
**synovial
fibroblasts**

**Inflammatory
cytokines**

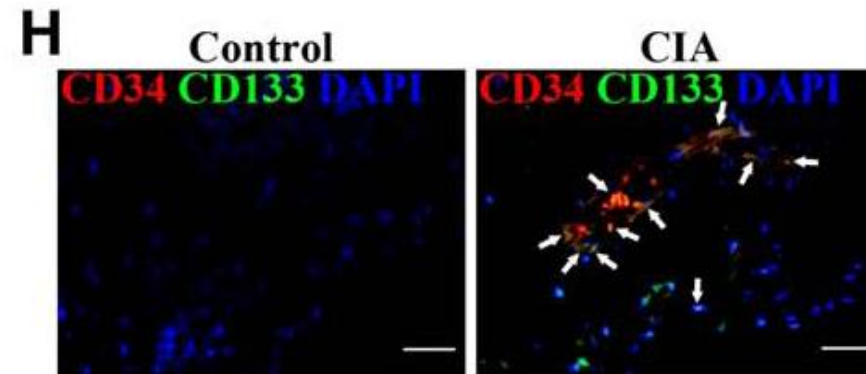
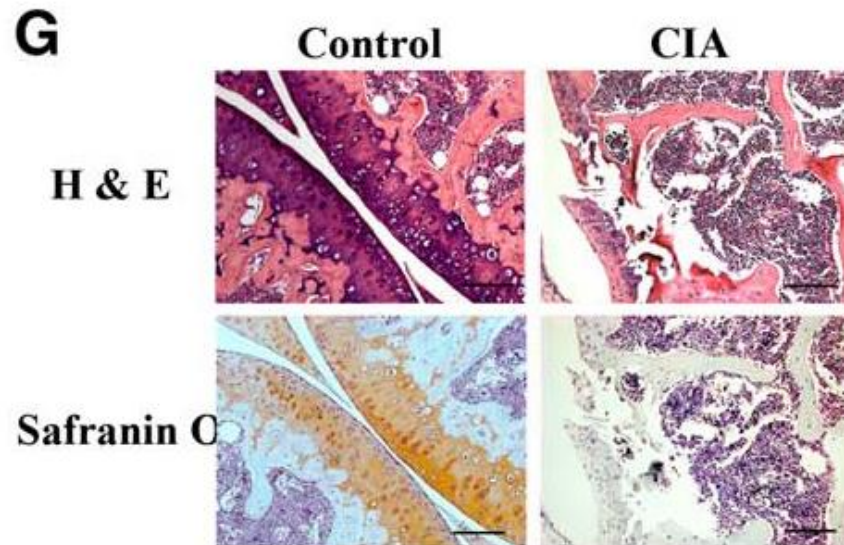
Endothelial progenitor cells (EPCs) angiogenesis



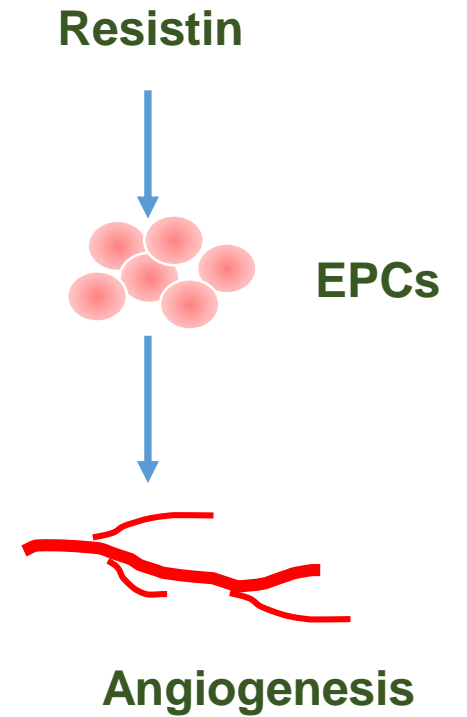
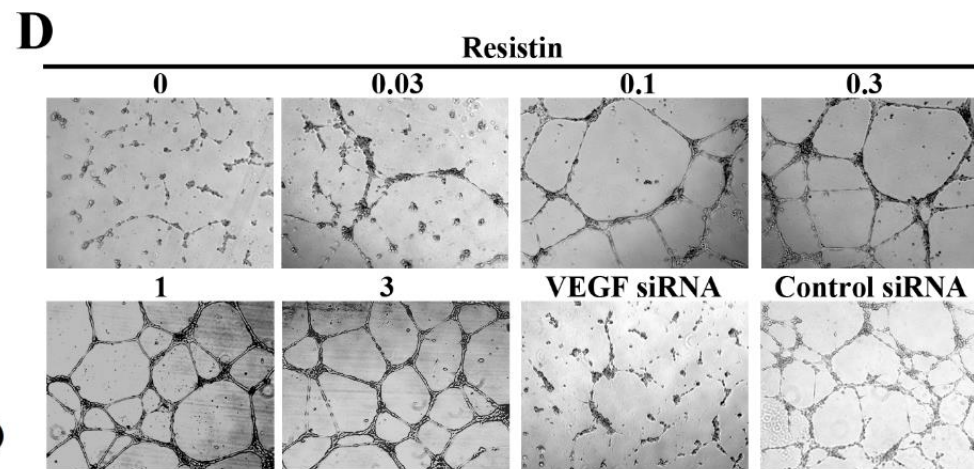
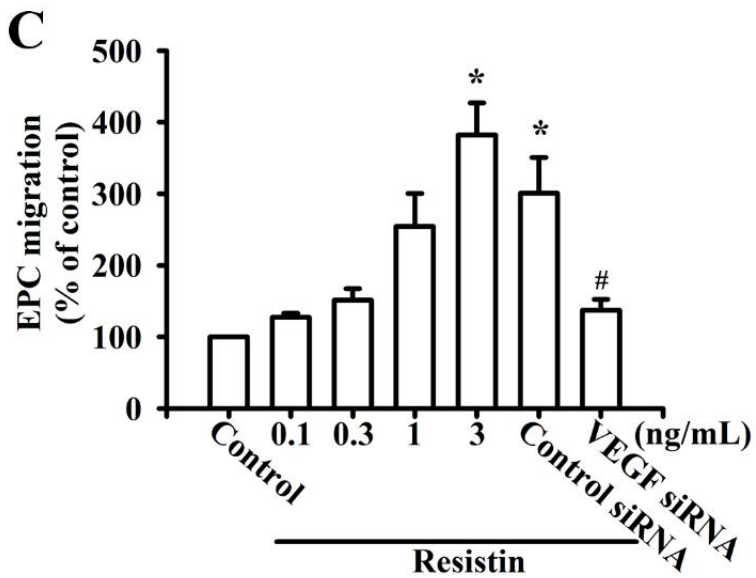
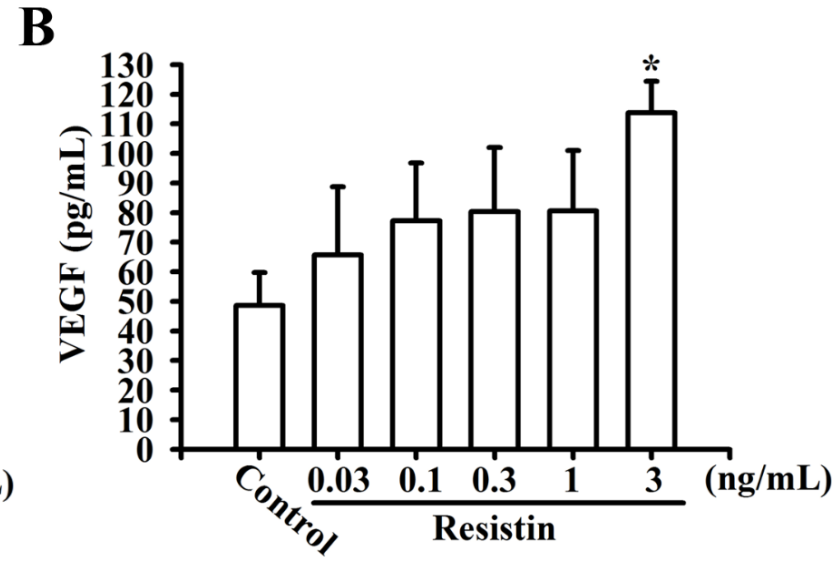
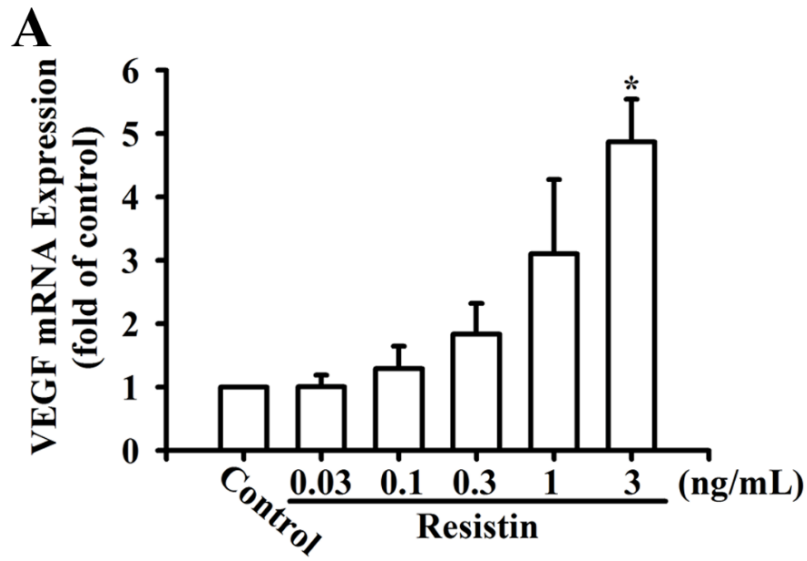
CIA mice showed significant bone erosion and EPCs infiltration



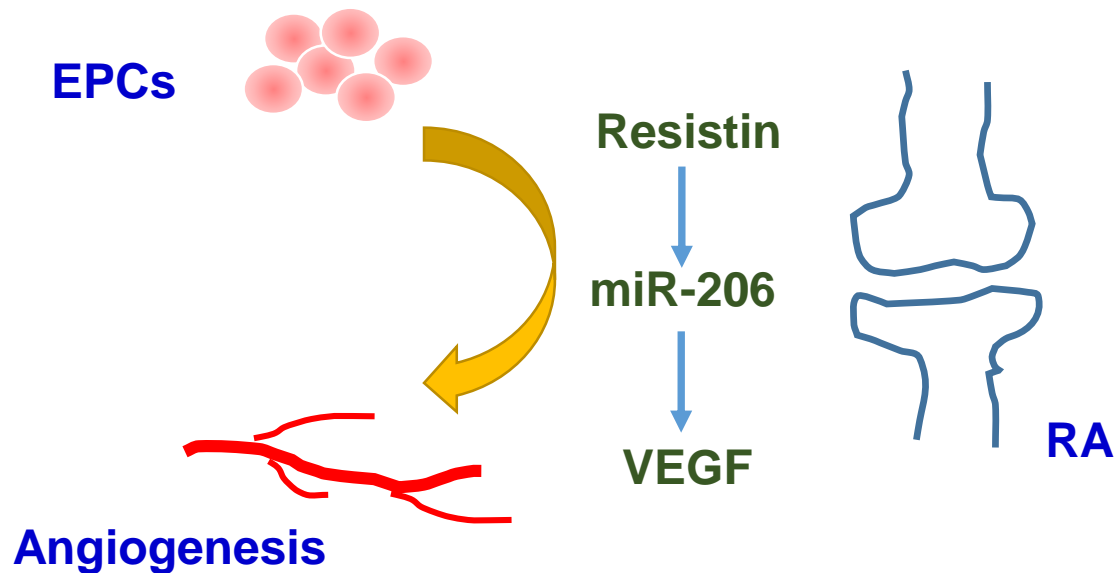
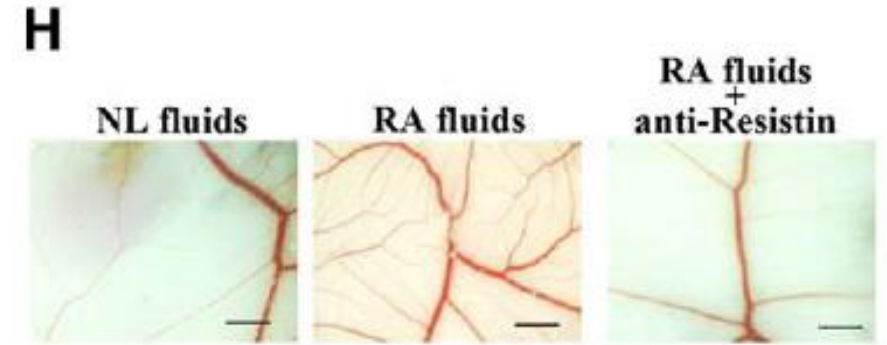
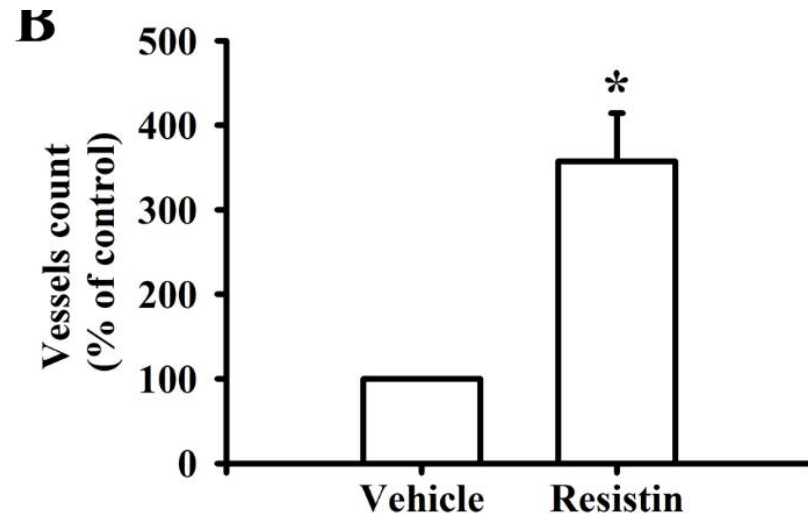
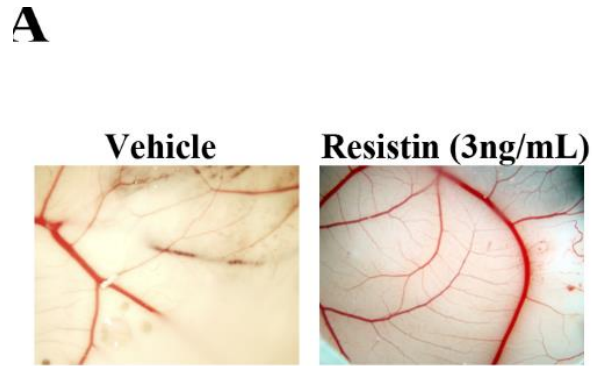
Su Chen-Ming



Resistin enhances VEGF production and angiogenesis in EPCs



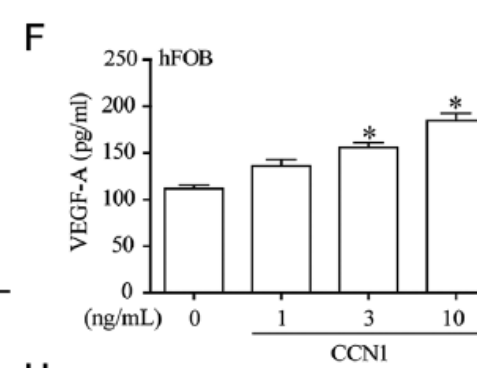
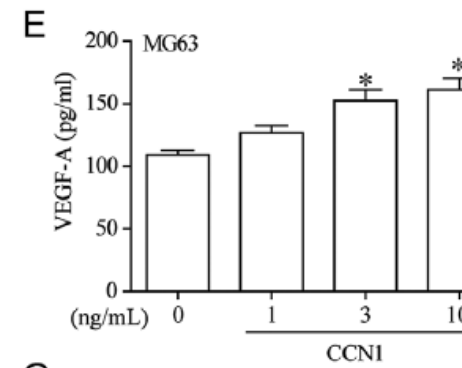
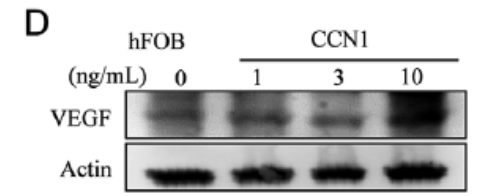
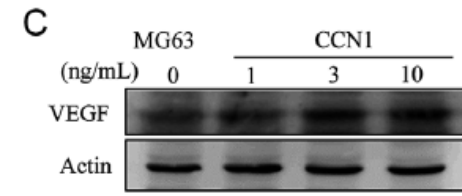
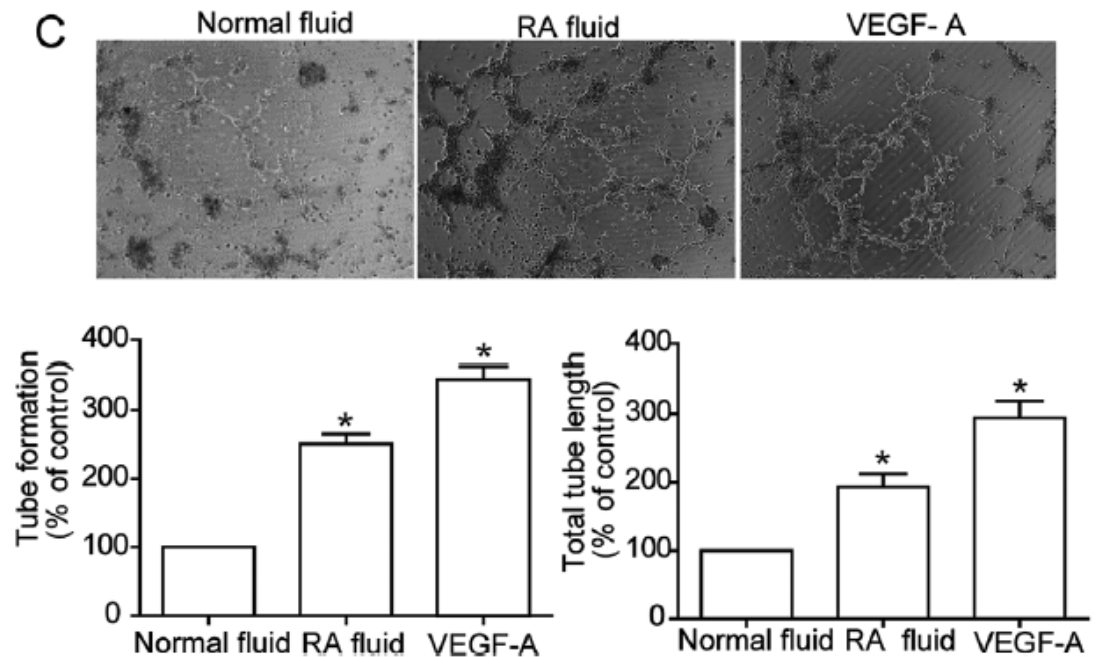
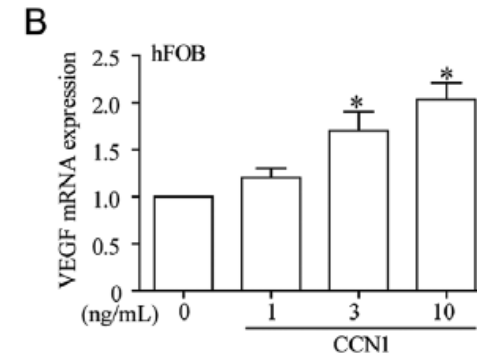
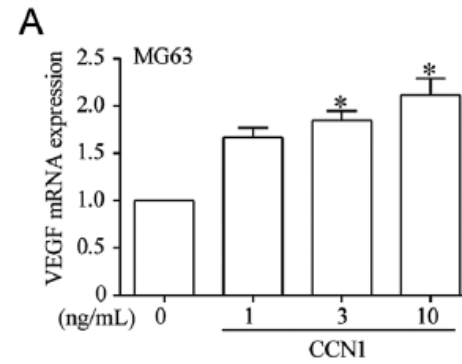
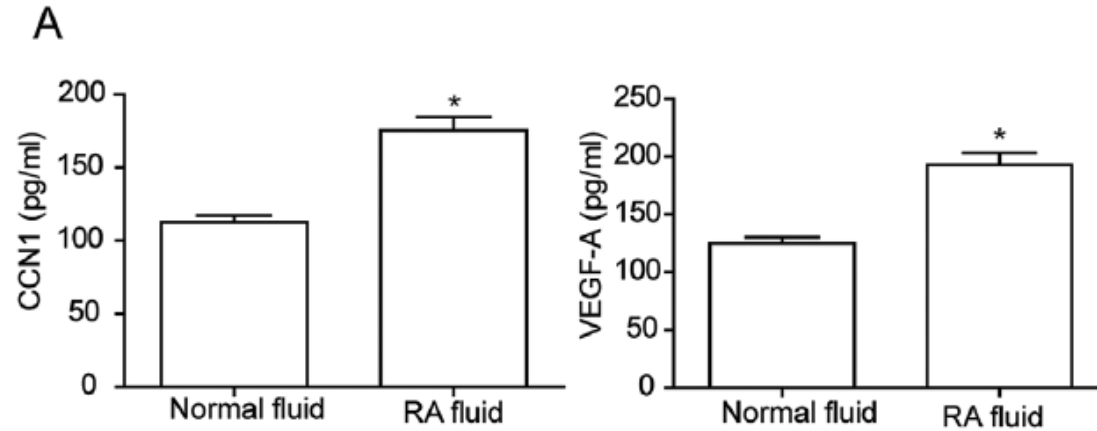
Resistin is associated with EPCs angiogenesis *in vivo*



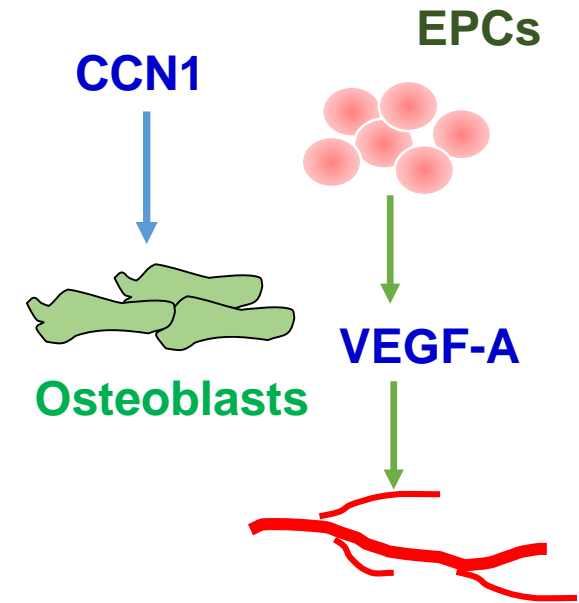
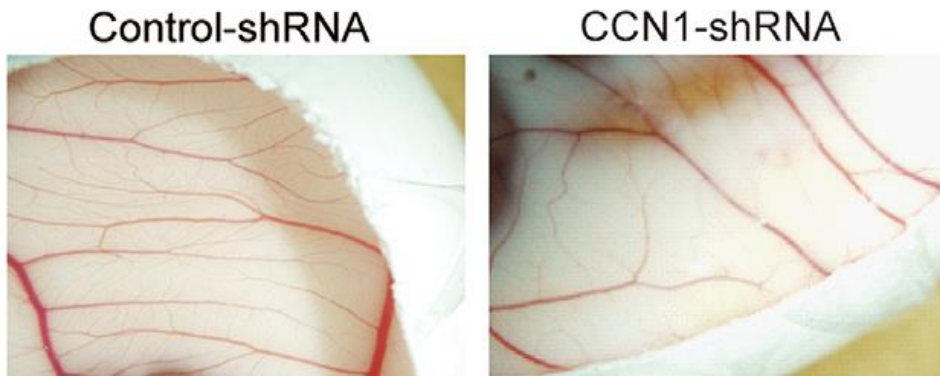
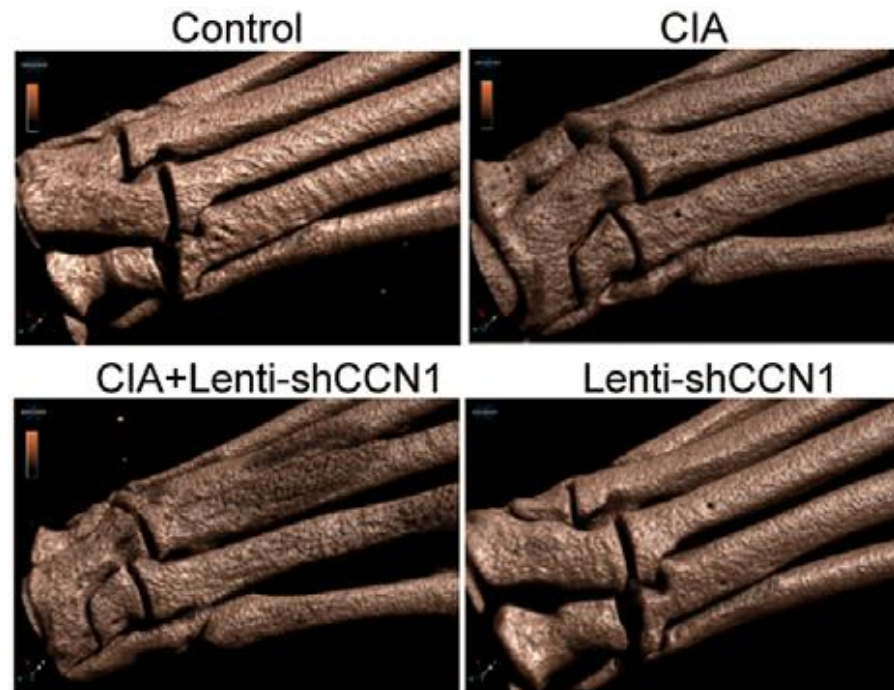
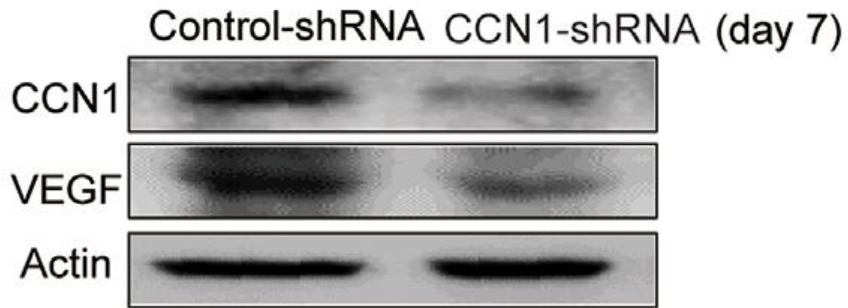
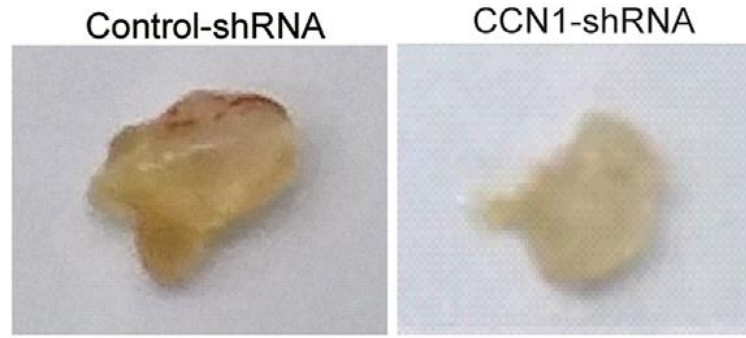
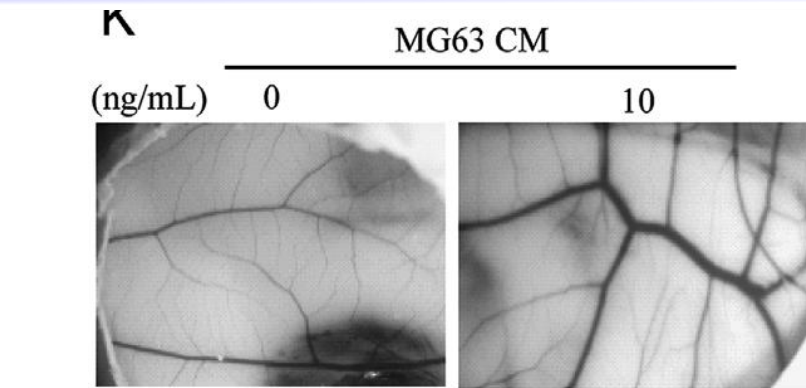
CCN1 Promotes VEGF Production in Osteoblasts and Induces EPC Angiogenesis in RA




Chen Cheng-You



CCN1 Promotes VEGF Production in Osteoblasts and Induces EPC Angiogenesis in RA



CCN1, a novel RA target?

 CCN1 is an important ... cytokine in rheumatoid arthritis

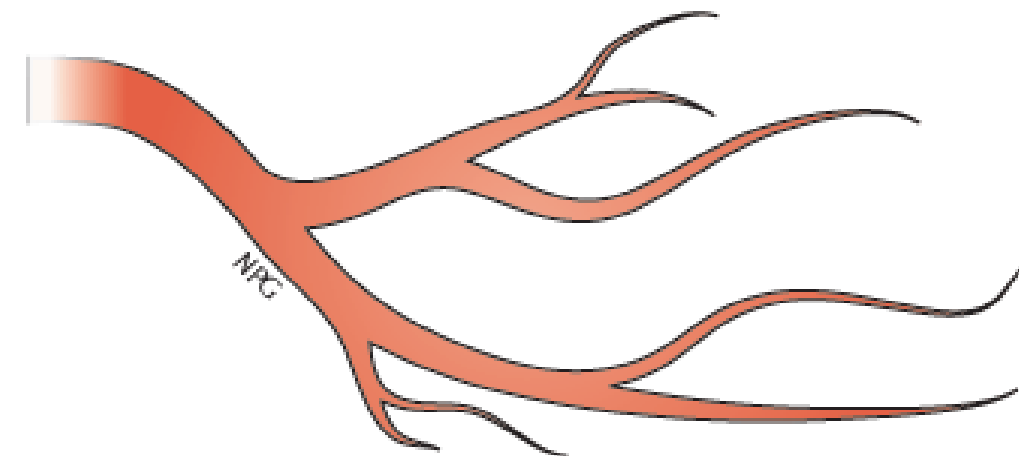


Protein CYR61 (cysteine-rich angiogenic inducer 61, also known as CCN1) is an important pro-inflammatory cytokine in rheumatoid arthritis (RA), according to new evidence published by [Taiwanese researchers](#). They found elevated levels of CCN1 in synovial fluid from patients with RA, and showed that in mice with collagen-induced arthritis, a model of RA, knockdown of CCN1 (using a short hairpin RNA delivered by a lentiviral vector) suppressed joint swelling and cartilage erosion.

Interestingly, knockdown of CCN1 also blocked the production of vascular endothelial growth factor (VEGF) by osteoblasts, leading to suppression of pannus neovascularization and decreased expression of angiogenesis markers. “Our work also demonstrates a link between osteoblasts and angiogenesis in RA,” highlights [Chih-Hsin Tang](#), corresponding author of the study. “We provide evidence showing that osteoblasts produce VEGF and promote endothelial progenitor cell (EPC) infiltration and angiogenesis in the joint microenvironment during RA,” he explains.

“This study reveals two major mechanisms through which CCN1 stimulates EPC-dependent angiogenesis,” comments Zoltán Szekanecz, who was not involved in the study. Specifically, he notes, “CCN1 inhibits the microRNA

Highlighted: Nat Rev Rheumatol 2016

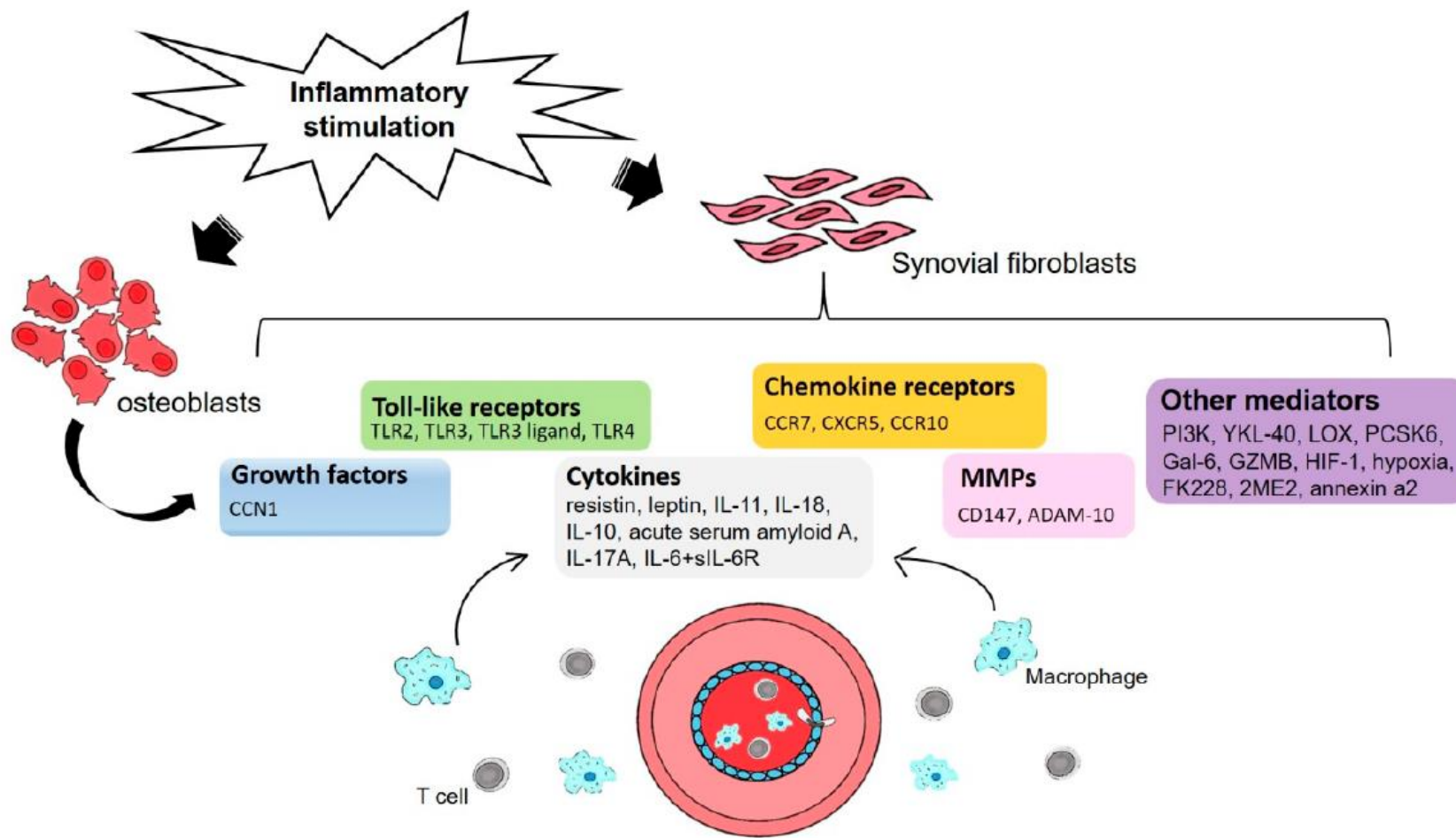




Liu Shen-Chi

Review

Implications of Angiogenesis Involvement in Arthritis

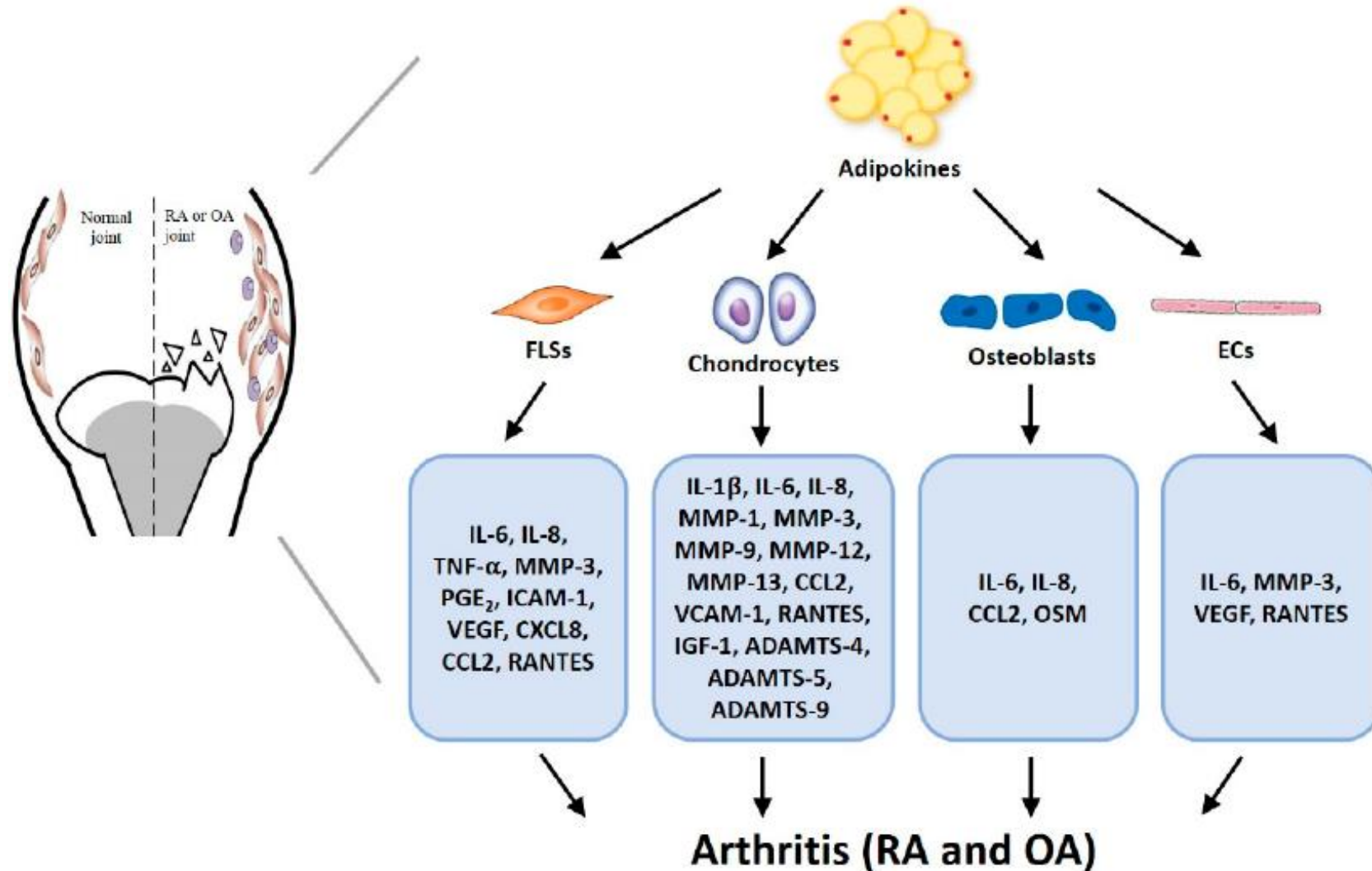


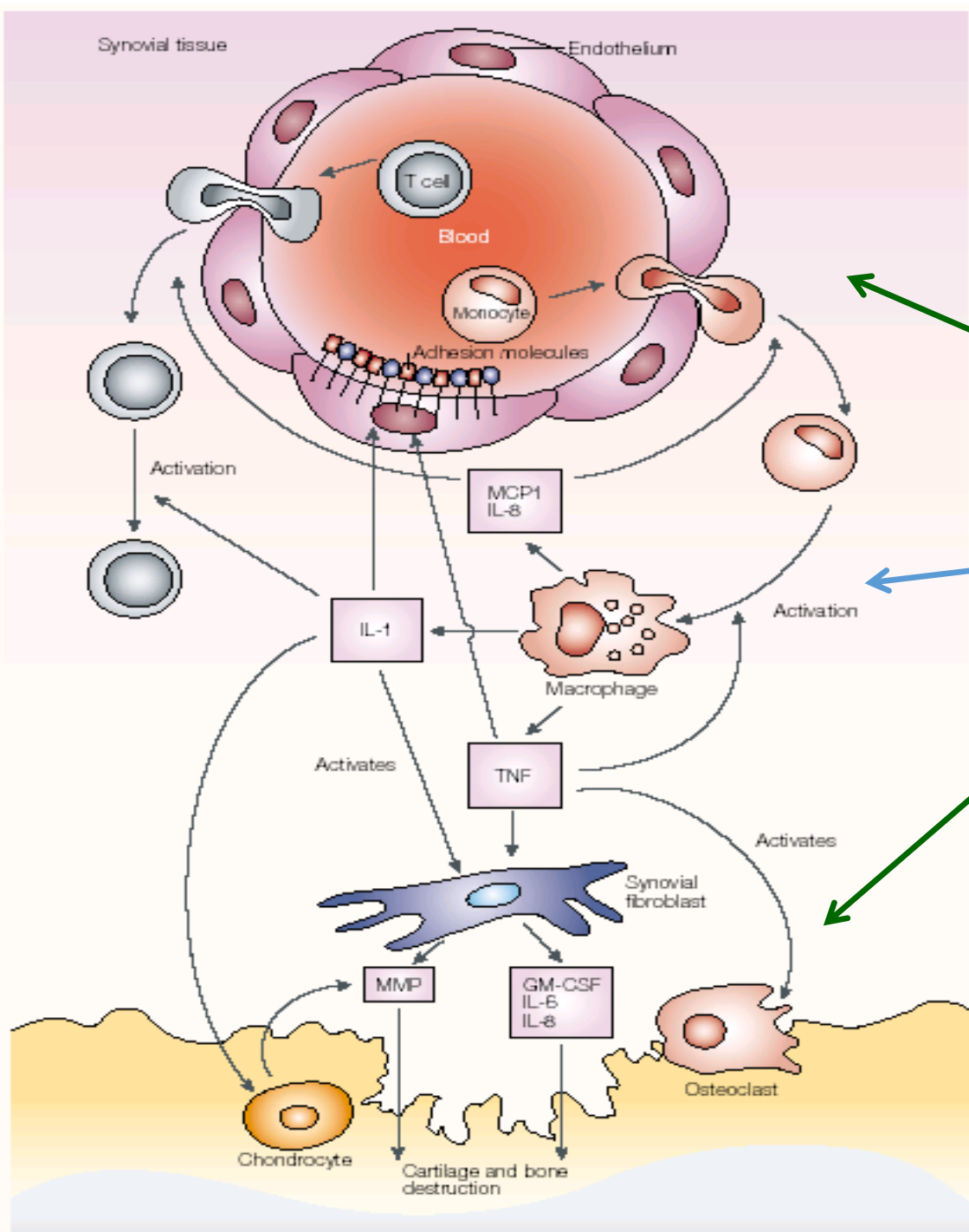


Liu Shen-Chi

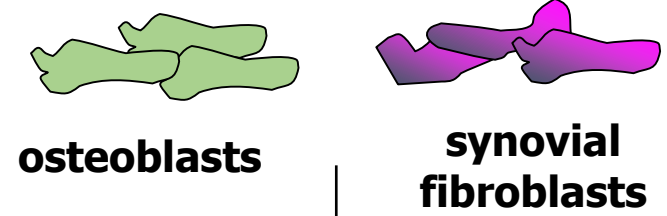
Review

Associations between Adipokines in Arthritic Disease and Implications for Obesity



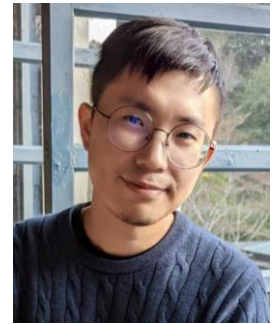
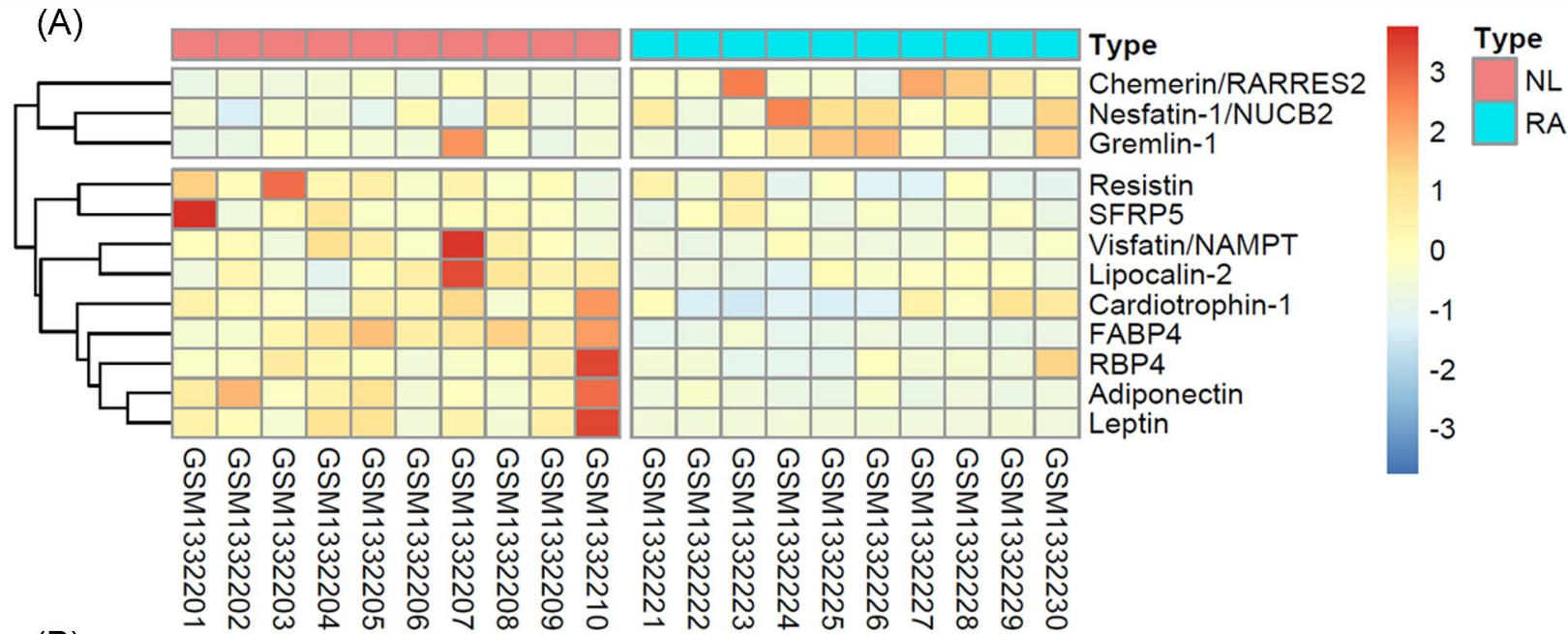


Adipokines (Adiponectin; Leptin; Resistin...)

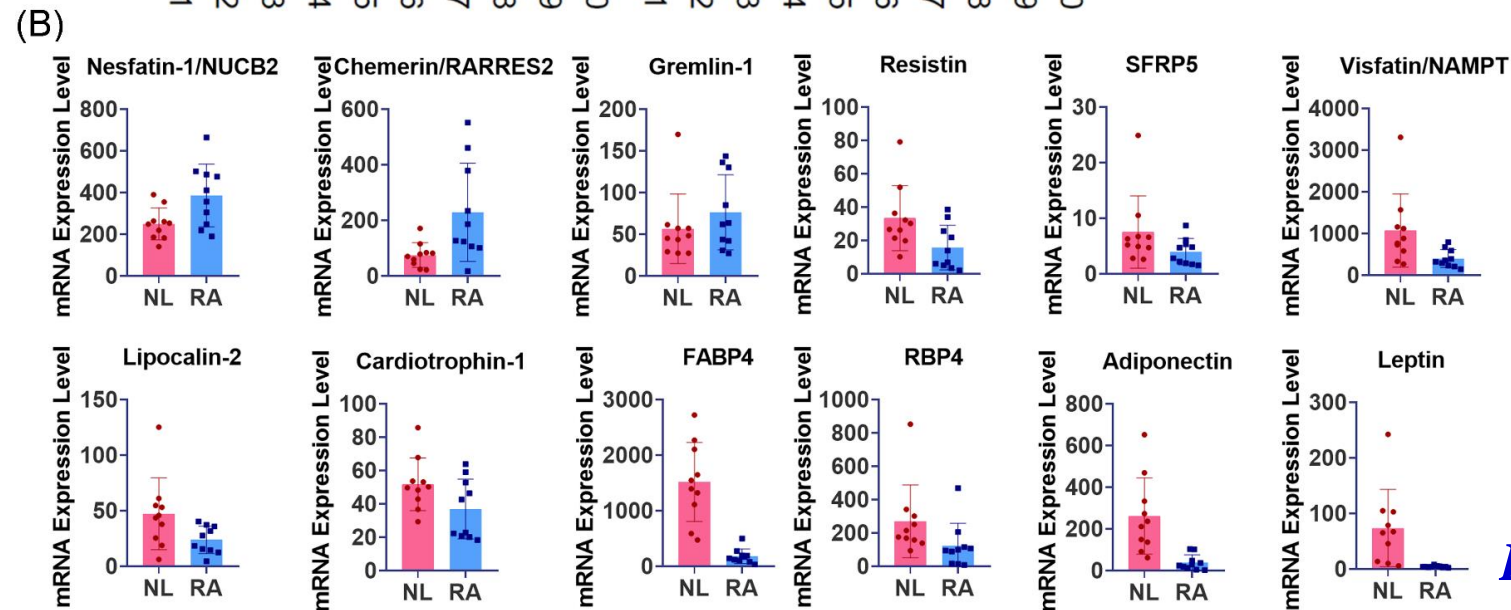


Inflammatory cytokines

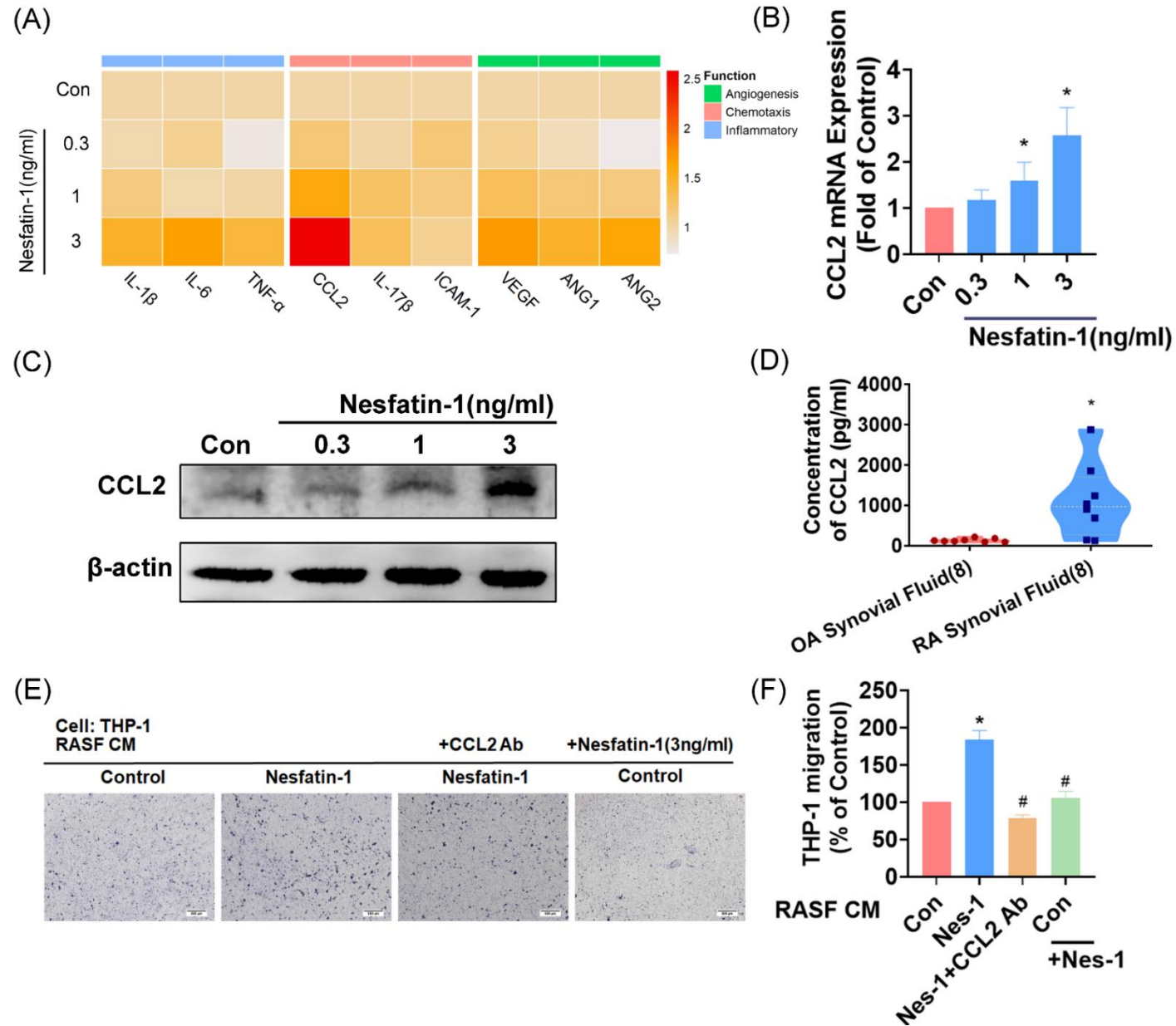
Nesfatin-1 is the highly expressed adipokine observed in RA synovial tissue



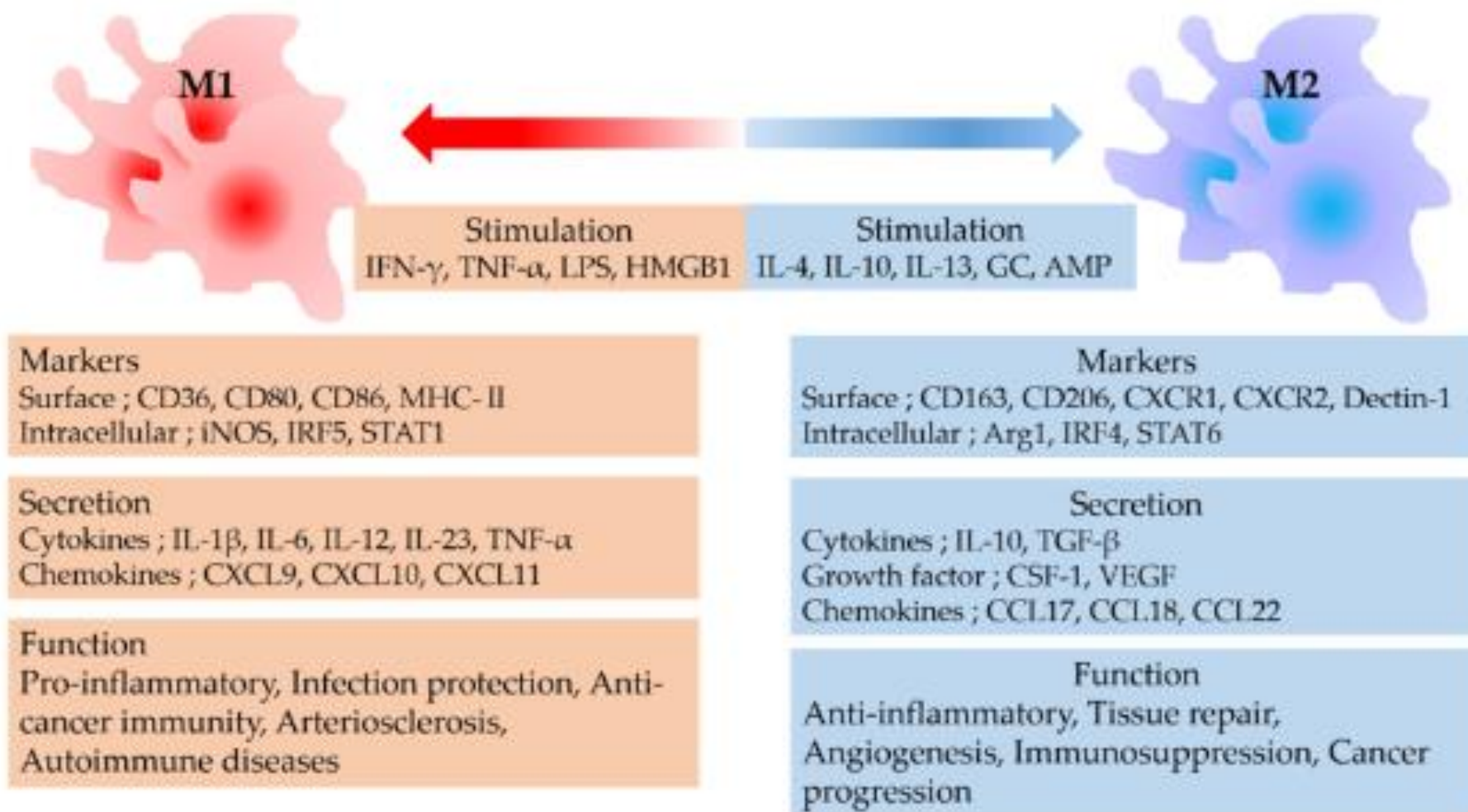
Chang Jun-Way



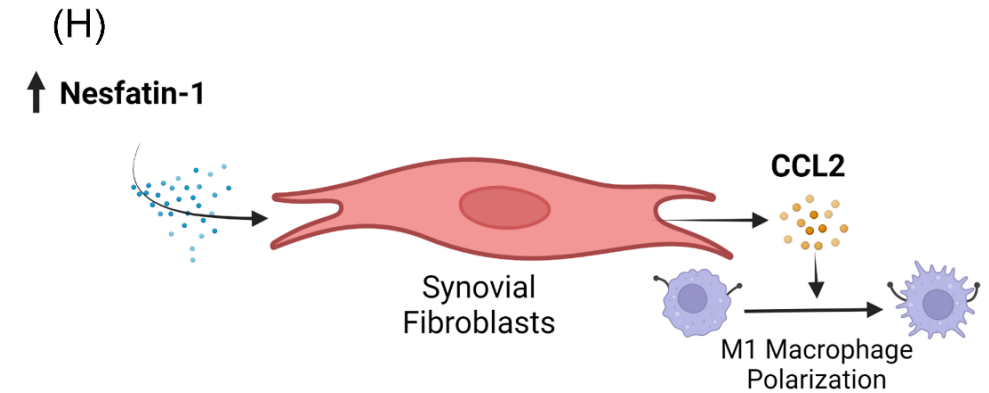
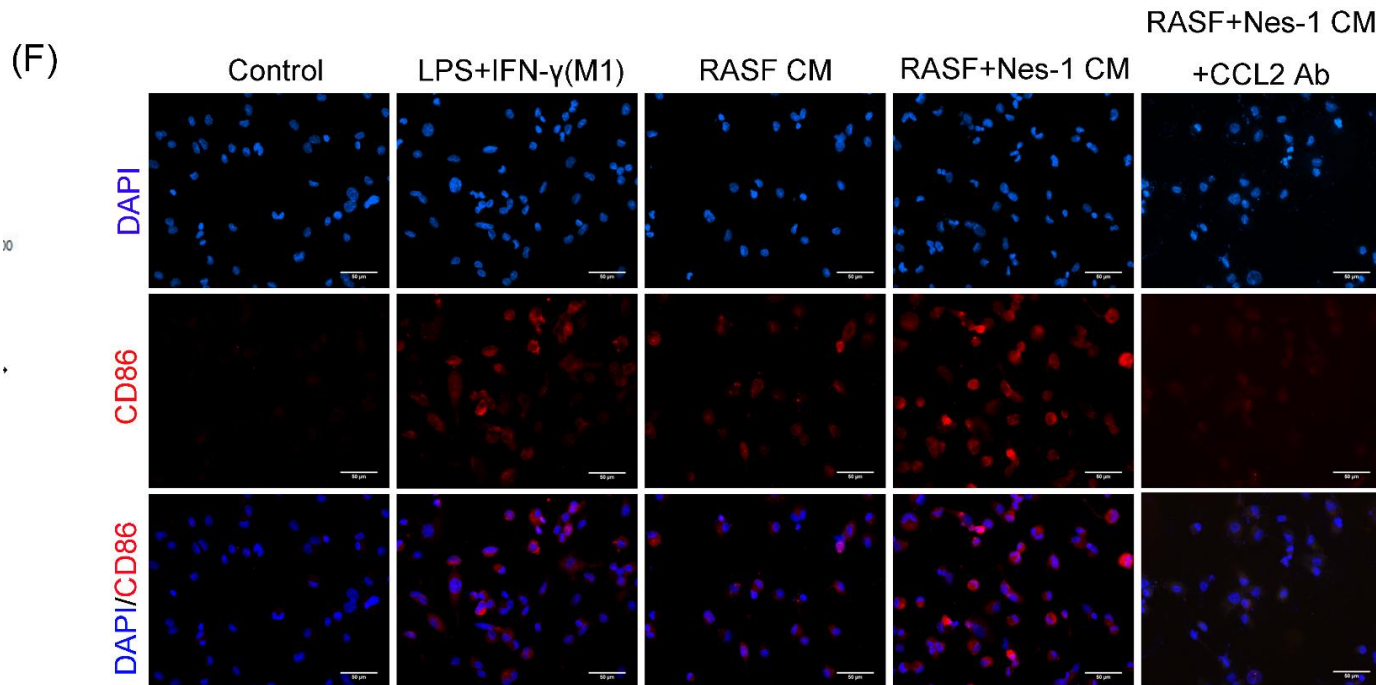
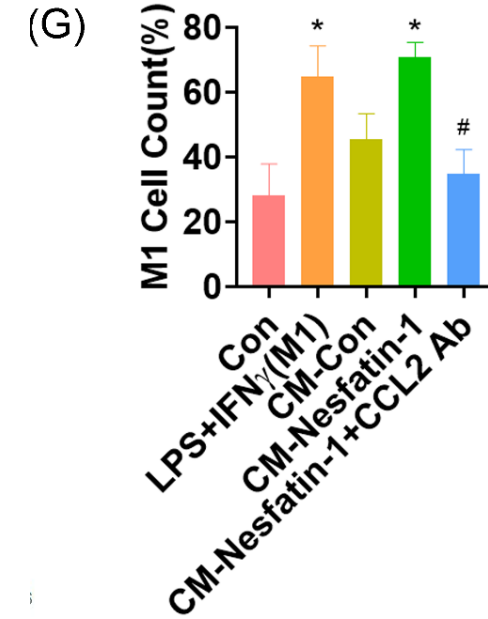
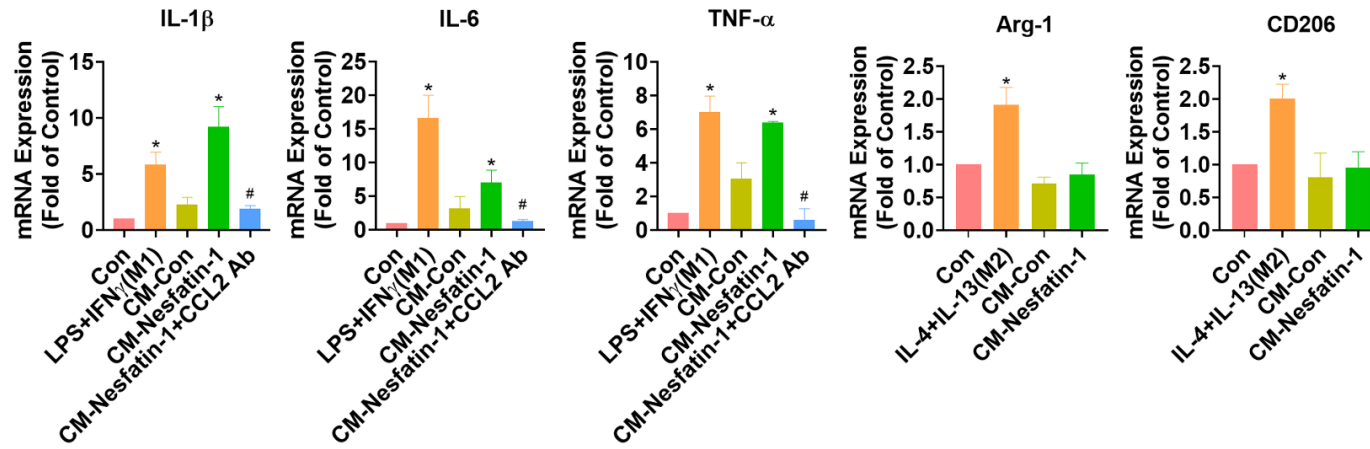
Nesfatin-1 increases CCL2 expression in human RASFs and facilitates monocyte migration

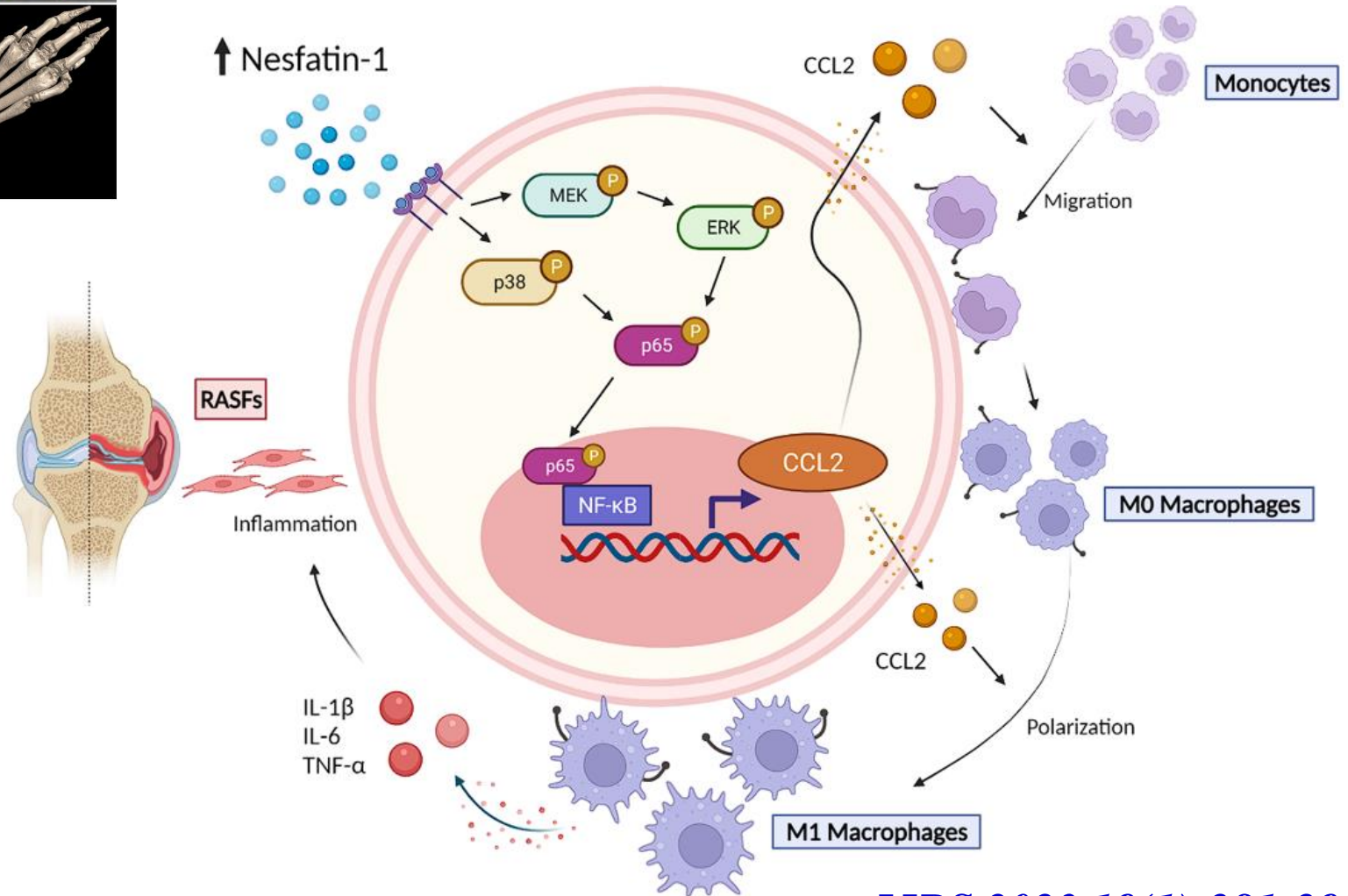
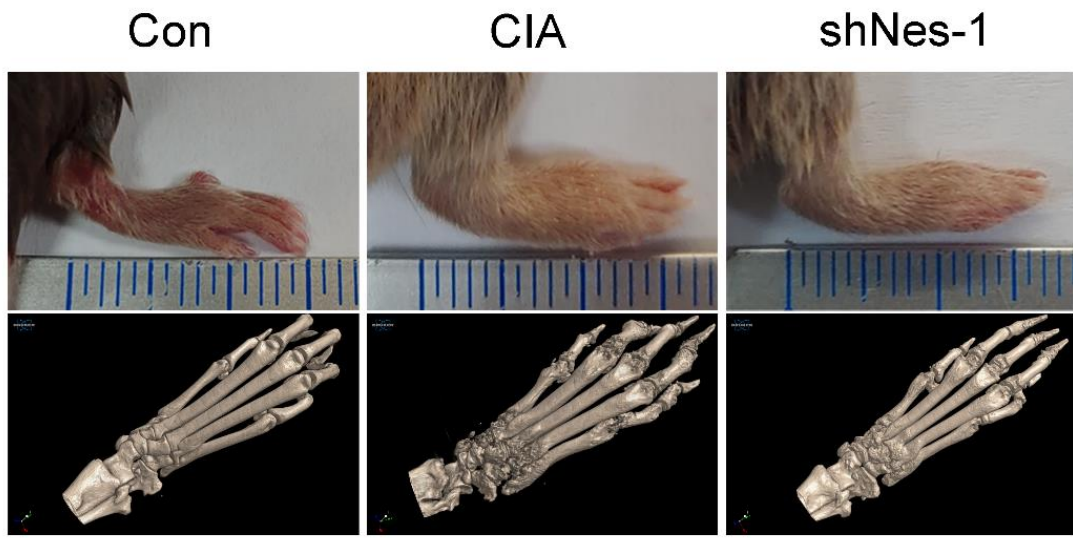


M1 and M2 macrophage polarization

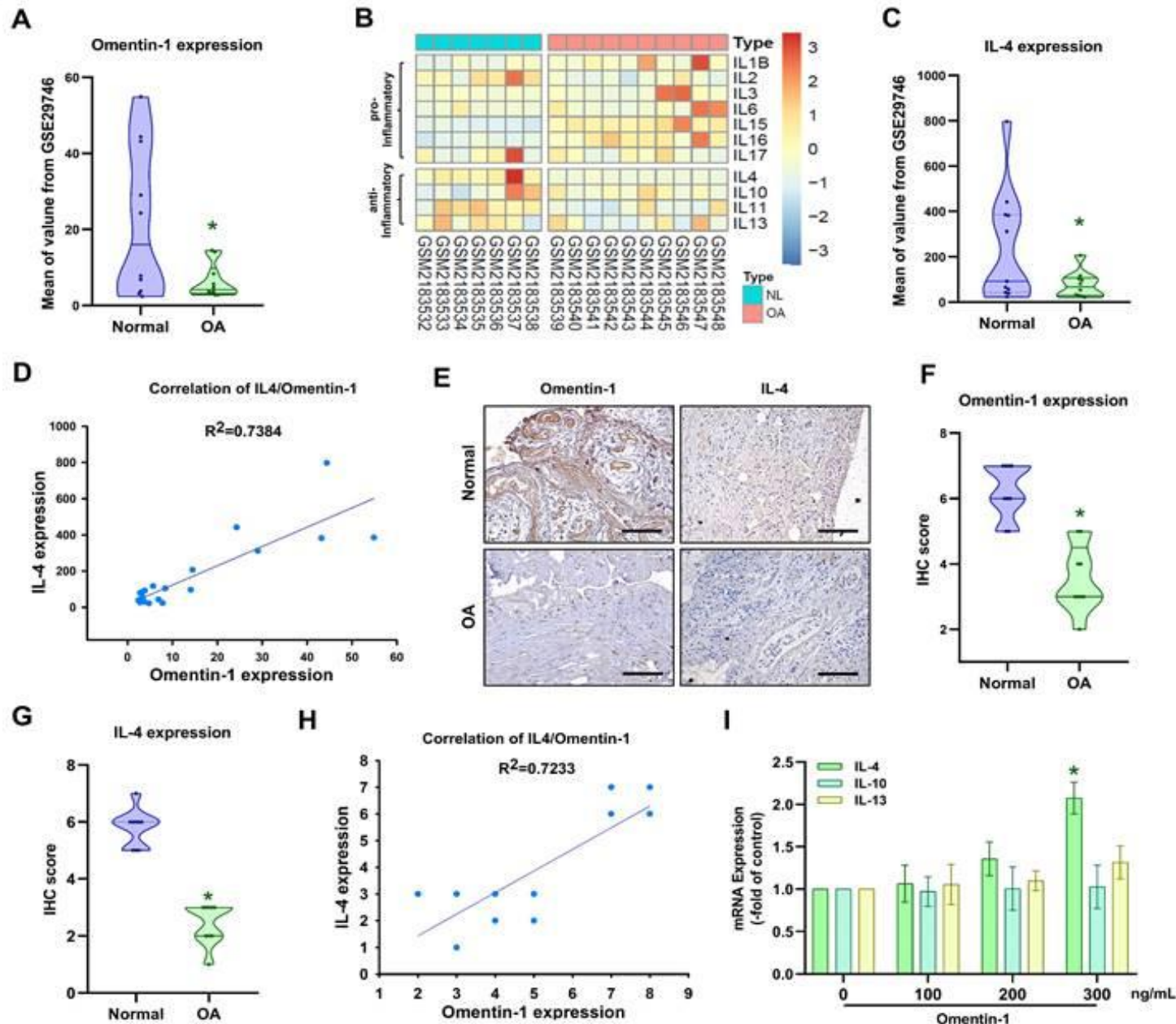


Nesfatin-1-induced increases in CCL2 expression mediated M1 macrophage polarization



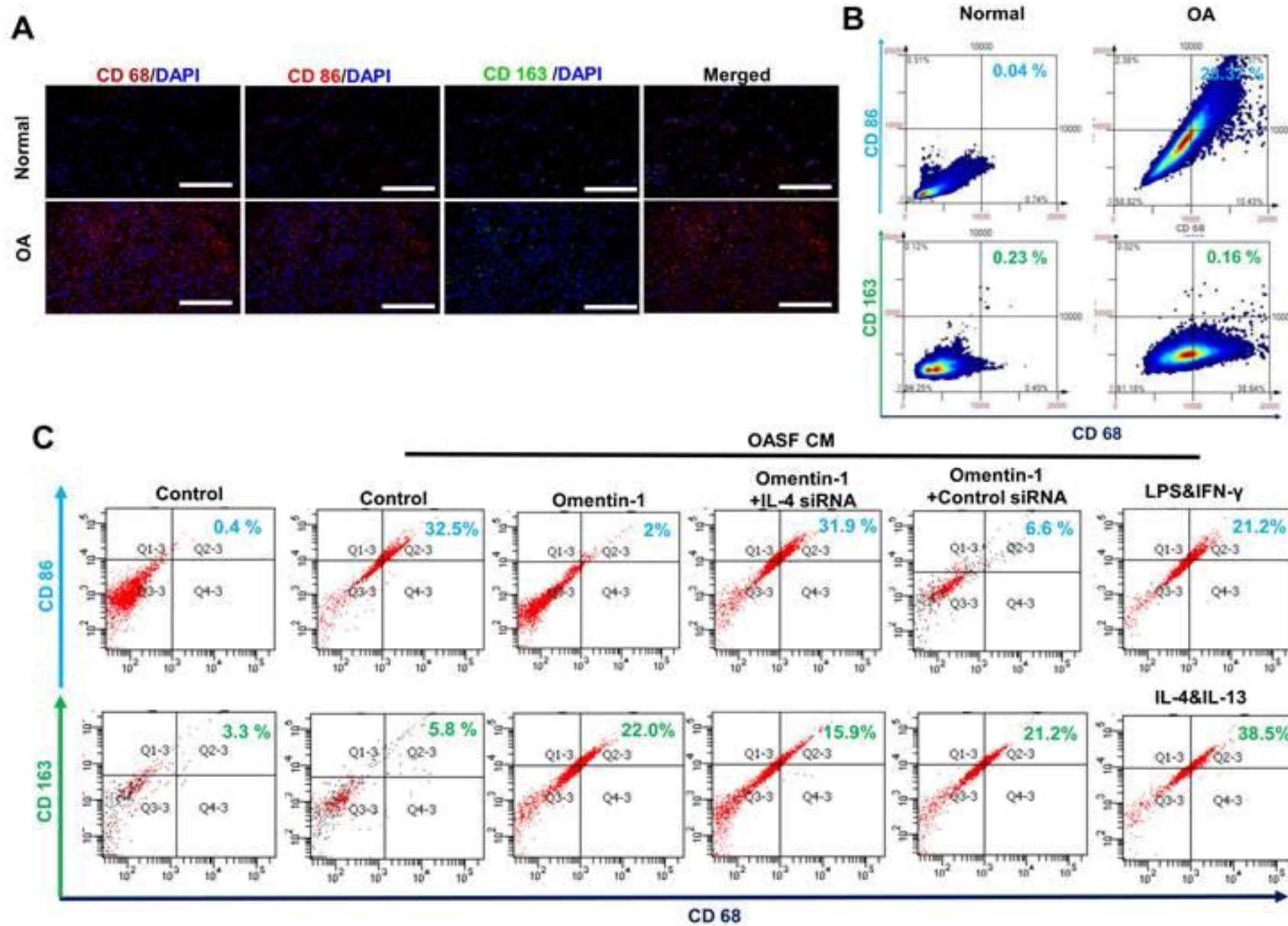


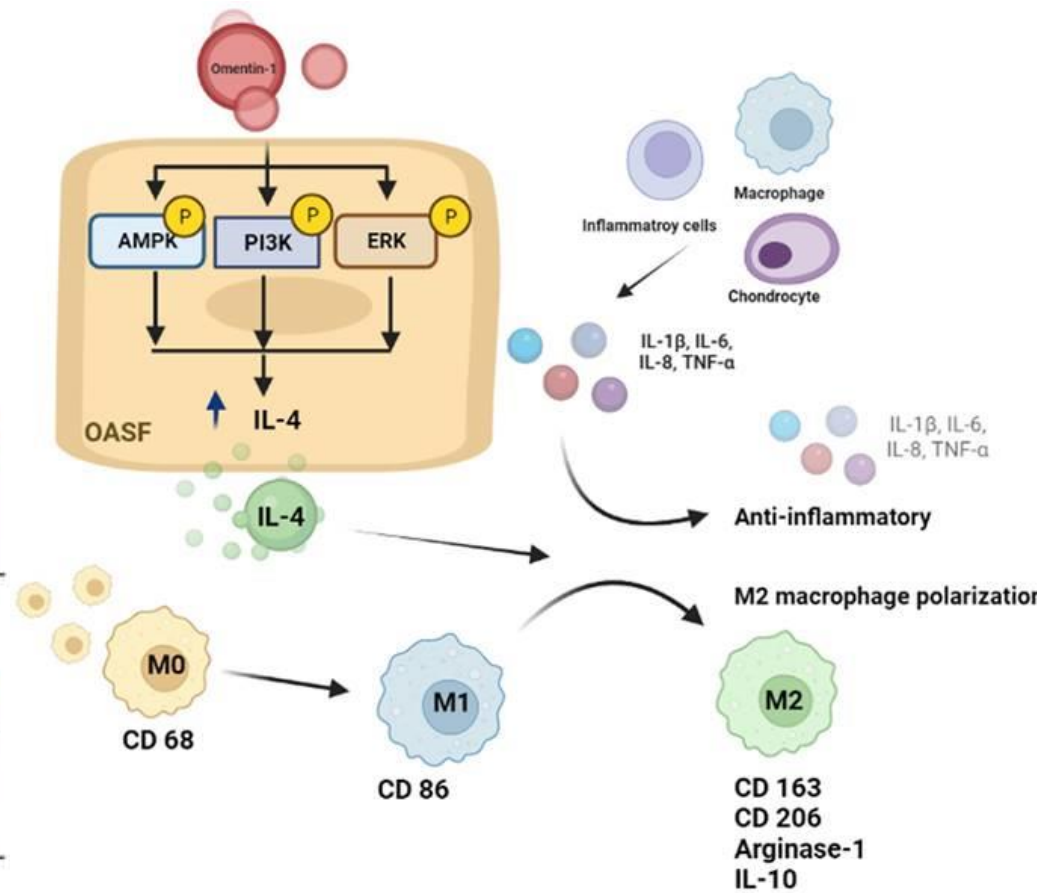
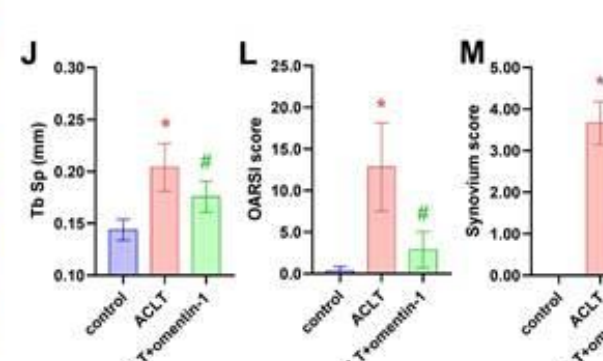
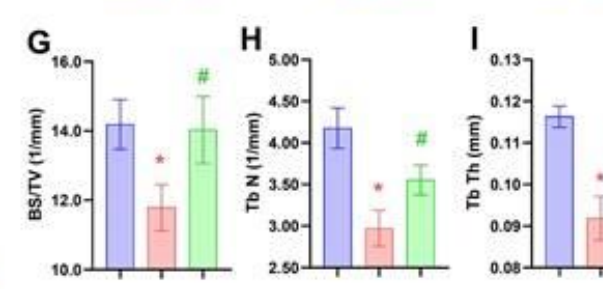
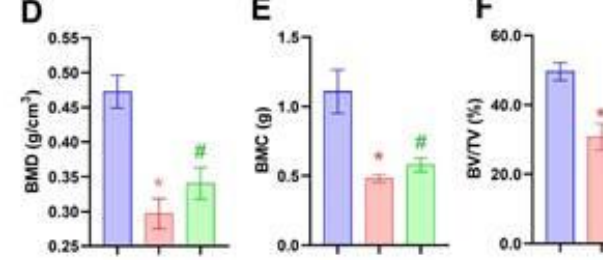
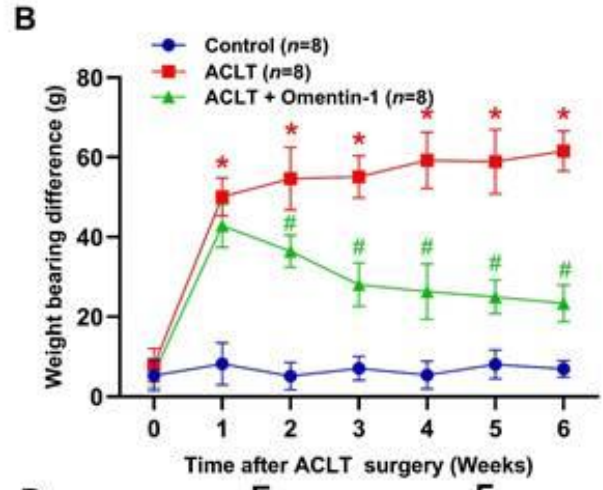
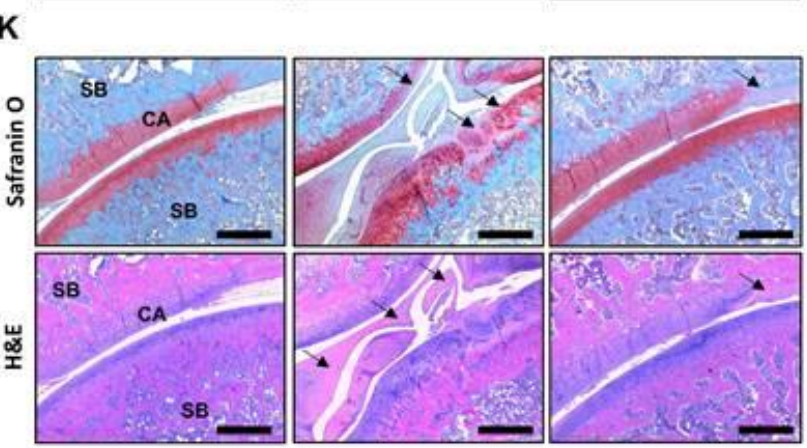
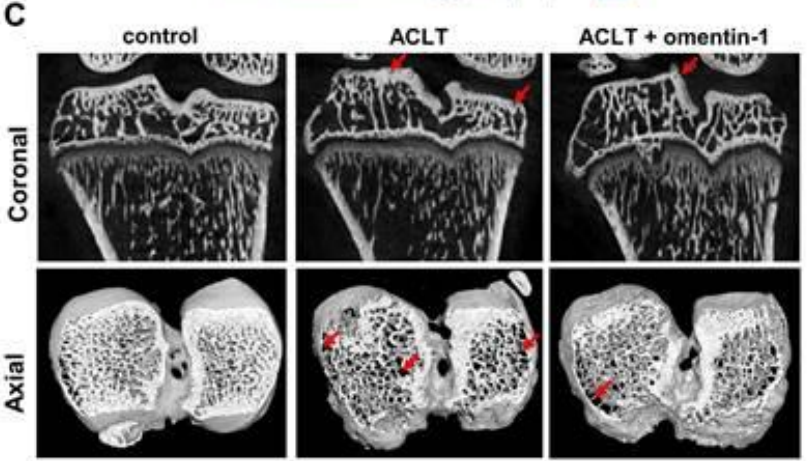
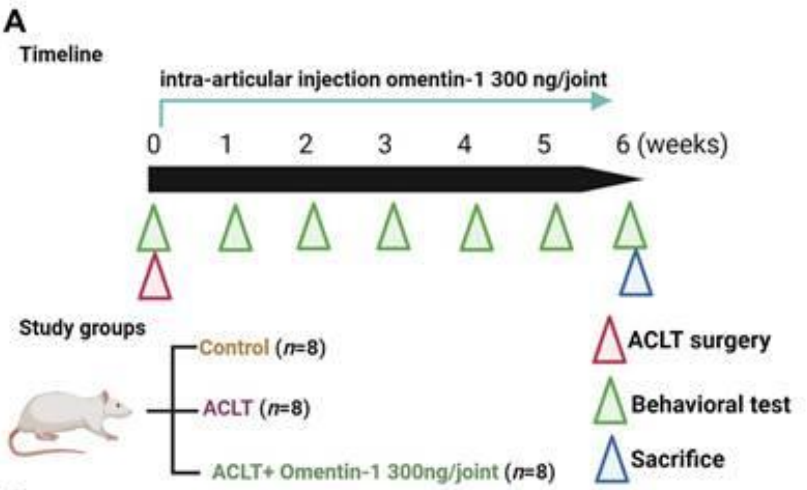
Omentin-1 and IL-4 are negatively correlated with OA progression



Lin Yen-You

Omentin-1 enhanced IL-4-dependent polarization of the M2 macrophage







Adipocytes

Inflammatory adipokine

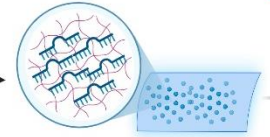
Adiponectin

Leptin

Nesfatin-1

Anti-inflammatory adipokine

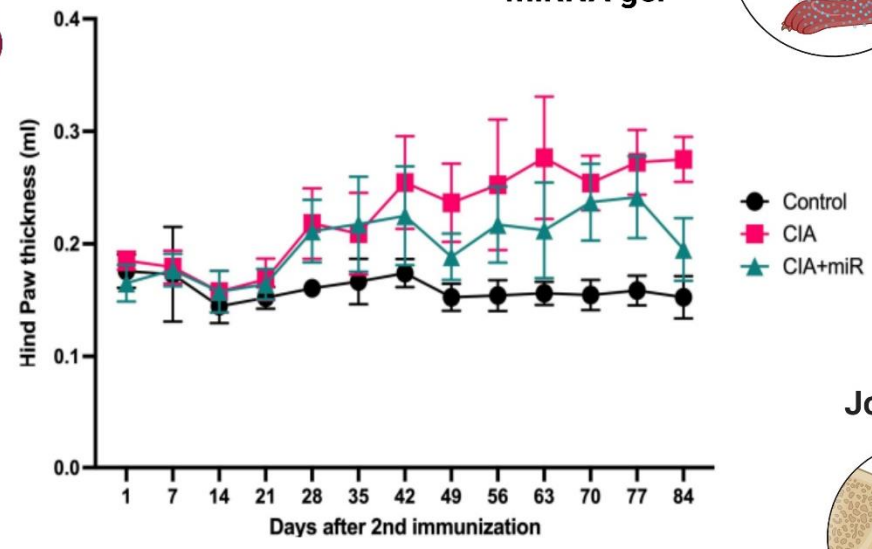
Omentin-1



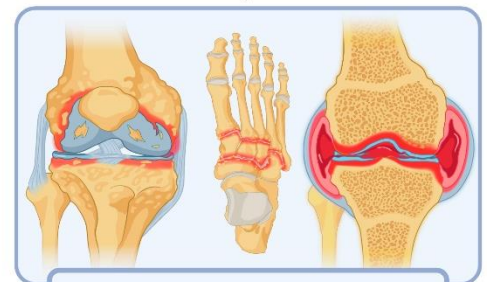
miRNA gel



CIA mouse model

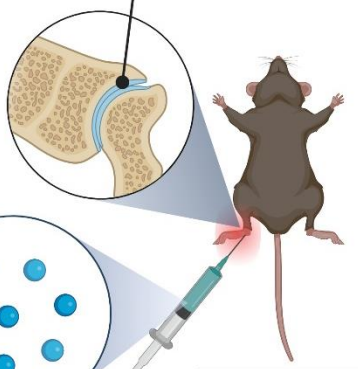


● Control
■ CIA
▲ CIA+miR



Arthritis disease

Joint injection



CIA mouse model

Thanks for your attention

Acknowledgments

Ministry of Science
and Technology of
Taiwan

China Medical
University & Hospital

CMU&H

Yang-Chang Wu

Yi-Chin Fong

Chun-Han Tsai

Chien-Chung Huang

