



TMU-Research Center of Urology and Kidney Monthly Meeting

Times : 2026/06/17(Wednesday) 12:00-13:30

Venue: Hybrid Meeting (In-person & Online)

(Please sign in to the meeting using your full name for attendance verification.)

Google meet link : <https://meet.google.com/ihn-wugo-jfv>

In-person Venue: Conference Room 1, 10th Floor, First Medical Building, Shuang Ho Hospital

Meeting Chairperson : Mei-Yi Wu

Participant :

【TMUH】 Ming-Zhe Liu, Shao-De Ye, Zhi-Qi Gao, Jian-Zhi Wu, Zheng-Cheng Wu, Jing-Xin Zhang, De-Zhao Fang, Yi-Wen Wu, Xi-Xian Chen, Yang-Ren Jiang, Jing-Yi Chen, Yan-Zhong Lin, Yue-Zhu Shao, An-Qi Zhou, Zhi-Kuan Wu, Qi-Tai Li, Xiao-You Lin, Jian-Rong Huang, Zhen-Wen Chen, Bao-Bao Chen, Dong-Lin Cai

【WFH】 Yu-Qing Wen, Ming-Zhe Li, Wei-Wen Zhang, Yong-Wei Lin, Zhi-Hao Xiao, Xuan-Hao Xu, Zong-Hao Lai, Zhuo-Xing Zhong, Zhong-Yi Zheng, Zuo-Xiao Chen, Chong-De Liu, Yun-Hong Yang, Yu-Xiang Yang, Liang-Ming Li, Ke-Xun Lin, Yue-Lin Wu, Hong-Wei Liao

【SHH】 Ming-Zhe Li, Jia-Zhang Wu, Guan-Zhou Chen, Jia-Hong Liu, Yi-De Jiang, Kai-Yi Zou, Wei-Tang Gao, Shu-Wei Hu, Mei-Yi Wu, Li-Yu Hong, Cai-Mei Zheng, Jia-De Liao, Rui-Xiang Song, Min-Guang Cai, You-Wei Chen, Zhi-Hua Gao, Guan-Hong Lin, Jian-Hua Zeng, Bo-Han Qiu, Zhi-Heng Chen, Shao-Wei Dong, Yu-Cong Yin, Yu-Feng Lin

【TMU】 Wei-Cheng Luo

【SKMH】 Yu-Mou Su, Ju-Lin Zou, Ming-Jie Jiang, Yu-Chan Lin, Wen-Ling WeiChu-Lin Chou

Chief : Mai-Szu Wu (President, TMU) 、 Chih-Cheng Hsu (Professor, NHRI) 、
Ruei-Ming Chen 、 Shing-Hwa Lu 、 Yung-Ho Hsu

Agenda: :

I. Invited Speaker – Prof. Szu-Chun Hung, Taipei Tzu Chi Hospital

Topic: Metabolomics in CKD: A Million Dollar Lesson

II. Team Presentation

Functional Urology Team.(If presentation assistance is required, please provide the slides no later than one day prior to the meeting.)

III. Administrative Announcements

1. The Center's official website is currently being redesigned by a contracted vendor. Members are welcome to provide notable achievements or highlights for inclusion on the new website. (Please email relevant materials to 25120@s.tmu.edu.tw or share them via the RCUK group.)
2. The next regular meeting will be held on July 30, 2026 (Thursday), 12:30–14:00 PM.
 - Guest Lecture: Prof. Ching-Ho Hsieh, Academia Sinica
 - Venue: Hybrid Meeting (In-person & Online)
 - In-person Venue: Conference Room 1, 10th Floor, First Medical Building, Shuang Ho Hospital
 - Team Presentation: Innovative Urological Technologies and Surgery Team.(If presentation assistance is required, please provide the slides no later than one day prior to the meeting.)
3. We kindly ask the Chiefs of the three affiliated hospitals and three divisions to assist in inviting members who have not yet joined the LINE group to do so as soon as possible, in order to ensure timely communication of upcoming events

and announcements.

(The LINE group currently has 48 members including the secretary, while RCUK has a total of 72 members.)



Investigating the Effect of Amniotic Fluid Stem Cell-Derived Exosomes to treat Moderate to Severe Erectile Dysfunction

功能性泌尿團隊
萬芳醫院泌尿科 林雍偉醫師

Application of Stem Cell in Human Erectile Dysfunction

Author	Year	Design	Setting	N	Treatment	Duration	Key Findings		
							Findings	Results	Indicators
Balik et al ⁴	2010	NCBA	Single center	7	One injection of human umbilical cord SC intracavernous 1.5×10^7 cells	11 months	• Improved morning erection	• 3 of 7 patients after 1 month	IIEF
Levy et al ⁷	2015	Pros Cohort	Single center	5	One injection of PM-MSC intracavernous 2 mL in 6 months	6 months	• Improved peak systolic velocity penis	• Significant after 6 weeks	PSV, EDV, stretched penile girth, angle of curvature
Haahr et al ¹⁰	2016	RCT	Single center	17	One injection of ADSC intracavernous 8.4–37.2 million cells in 6 months	6 months	• Improved IIEF-5 score	• 8 of 17 patients after 6 months • Patients with urinary incontinence tended are less likely to experience improvement of erectile function.	IIEF-5
Levy et al ⁸	2016	Pros Cohort	Single center	8	One injection of PM-MSC intracavernous 1.5 mL in 6 months	6 months	• Improved peak systolic velocity penis	• Significant after 3–6 months treatment. • EDV, penile girth and length, IIEF-5 scores did not change significantly.	PSV, EDV, stretched penile girth, IIEF-5
Yiou et al ¹¹	2017	RCT	Single center	18	One injection of BM-MNC intracavernous, 10^9 cells in 6 months	1 year	• IIEF-5 scores and erectile function	• Improvement after 6 months. • Reduced after 6 months follow-up	IIEF-5

Protogerou et al ¹⁴	2017	CBA	Single center	15	One injection of ADSC with PLP or ADSC without PLP or PLP	1 year	• IIEF-5 scores • Morning erection	• Improved IIEF-5 scores in patients after the first month. • Improved morning erection in all patients on the third month.	IIEF-5
Ory et al ¹³	2019	Ret Cohort	Single center	36	Transendocardial hMSC with a dosage of 20–200 million cells	1 year	• IIEF-5 scores • Erectile function	• Improved IIEF-5 scores significantly with the use of autologous or allogenic hMSC transendocardial. • A dosage of 200 million cells showed significant improvement of erectile function after 12 months.	IIEF-5
Nasab ¹²	2020	RCT	Single center	20	One stem cell injection intracavernous oral mucosal 50–60 million cells in 6 months.	6 months	• IIEF-5 Score • Peak Systolic Volume • Resistance index	• Improved IIEF-5 score significantly between before therapy, 3 months, and 6 months post-therapy. • Improved peak systolic volume and resistance index in the treatment group, although not statistically significant.	IIEF-5, PSV, Resistance Index
Zasieda et al ⁸	2020	Pros Cohort	Single center	38	Six injections of MSC-DE 5 mL/week with LISWT 0.35 mJ/mm ² twice per week.	12 weeks	• IIEF-5 scores • EHS • Peak systolic velocity • End diastolic velocity	• Improved IIEF-5 and EHS scores significantly after treatment regimen. • Improved peak systolic velocity and reduced end diastolic penile velocity significantly posttherapy.	IIEF-5, EHS, PSV, EDV

Research and Reports in Urology 2022;14 379–388

羊水幹細胞 (MSC 4.0)

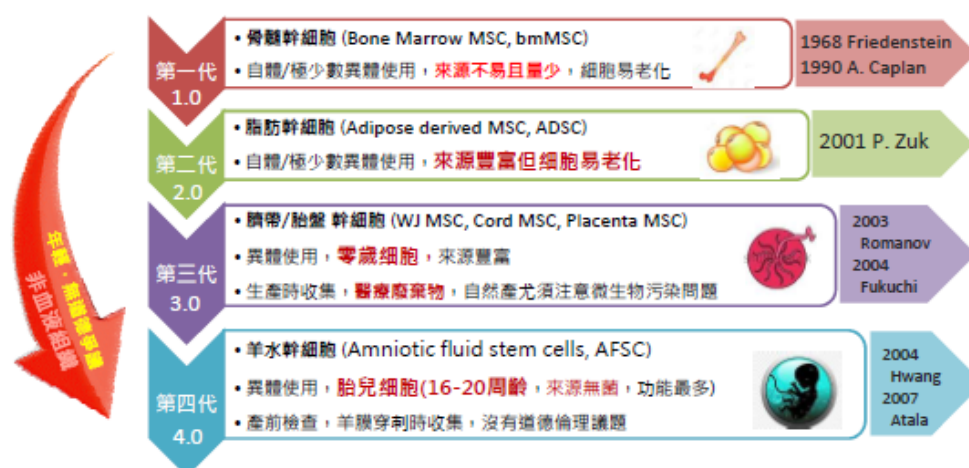


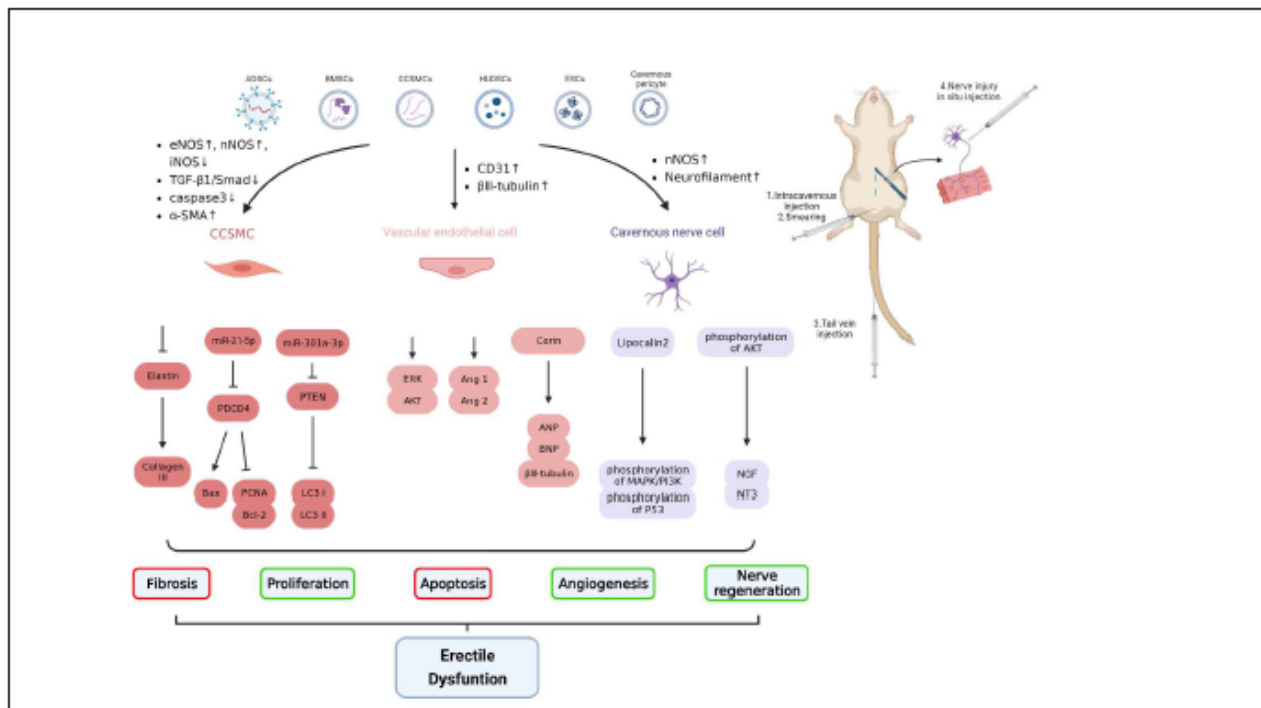
Table 1 The Comparison Between Stem Cell Therapy and Stem Cell-Derived Exosome Therapy

Treatment Modality	Advantages	Limitations
Stem cells therapy	Multilineage differentiation potential Suitable for the treatment of various diseases Accumulation of extensive laboratory and clinical data Easy to isolate, suitable for large-scale production Less pain and fewer complications Well-established regulatory guidelines	Short survival time after injection, low transplantation rate Strict storage and transportation requirements Potential tumorigenicity Infusion toxicity Immunogenicity Some stem cells may have ethical issues (eg, embryonic stem cells) Preparation process needs improvement Variability in therapeutic outcomes Batch-to-batch inconsistency
Stem cells-derived extracellular vesicles therapy	Comparable therapeutic effects to stem cells but with a smaller size More concentrated functional carriers (eg, cytokines) Can be modified on their surface and within the carriers Various delivery methods Long-term storage and high transport efficiency EVs derived from non-tumorigenic cells pose minimal tumorigenic risk. Lack of ethical issues	Lack of standardized purification and storage protocols Relatively low yield in large-scale production Higher costs No industry-standard quality specifications Insufficient regulatory oversight

Effects of stem cell–derived exosome therapy on erectile dysfunction: a systematic review and meta-analysis of preclinical studies

Yunpei Zhu^{1,2}, Tiancheng Jiang^{1,2}, Chi Yao^{1,2}, Jiawei Zhang^{1,2}, Chao Sun, PhD^{1,2,*},
Shuqiu Chen, PhD^{1,2,*}, Ming Chen, PhD^{1,2,3,*}

- ED was associated with decreased expression of endothelial markers (VEGF, eNOS, CD31, etc), smooth muscle markers (α -actin, smoothelin, etc), and pericyte markers (CD146 and NG2)
- Exosome administration improve erectile function by activating the NO/cGMP signaling pathway, ameliorating endothelium, and inhibiting the fibrosis and apoptosis of cavernosum



Ongoing clinical trial

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Function of AFSC exosomes

- AFSC exosomes : cell-free nanoparticles secreted by AFSC containing **proteins, lipids, and microRNAs**.
- **Immunomodulation**: suppress inflammation and alter immune cell activity to create a healing microenvironment.
- **Tissue Repair & Regeneration**: accelerate wound healing and improve the regeneration of skin, hair follicles, nerves, and blood vessels.
- **Neuroprotection**: mitigate oxidative stress and inflammation in neurological conditions in Preclinical studies
- **Anti-Apoptosis**: prevent cell death and preserve function in damaged cells

The RNA Function Profile of Amniotic fluid stem cells, AFSC)

Anti-Fibrotic & Scarless Wound Healing

- **Primary Target**: Shutting down excessive **Transforming Growth Factor-beta (TGF- β) signaling**.
- **let-7-5p**: Directly suppresses tissue fibrosis and accelerates healthy cell proliferation.
- **miR-22-3p & miR-27a-3p**: Downregulate TGF- β receptor types I and II to block myofibroblast aggregation (preventing hard scar formation).
- **miR-21-5p & miR-23a-3p**: Regulate collagen distribution to mimic the soft matrix of fetal skin

The RNA function Profile of AFSC

Cell Preservation & Organ Development

➤ Anti-Apoptosis (Cell Survival)

- **miR-10a**: Prevents programmed cell death; protects ovarian follicles and vascular networks.
- **miR-146a**: Serves as a major anti-inflammatory switch to limit tissue degradation. [1]

➤ Organ & Tissue Development

- **miR-17~92 Cluster**: Essential for tissue branching and cellular differentiation.
- **Prenatal Research**: Proven to successfully rescue alveolar development in lung hypoplasia models.

The function of Protein Profile of AFSC

Regeneration, Angiogenesis & Immunomodulation

➤ Angiogenic & Repair Factors

- **VEGF**: Stimulates new blood vessel formation to supply oxygen and nutrients to damaged areas.
- **TGF- β 1 & FGF-2**: Orchestrate cell migration and proliferation to accelerate wound closure.
- **BDNF**: Protects neurons from oxidative stress and encourages nerve repair.

➤ Immunomodulatory Proteins

- **IL-10 & TGF- β (Cytokines)**: Act as biochemical "brakes" on the immune system.
- **M1 to M2 Switch**: Reprograms pro-inflammatory M1 macrophages into anti-inflammatory M2 healing macrophages.

Main Inclusion Criteria

1. Within 35-75 years old
2. Has been ever diagnosed with type 1 or type 2 DM
3. As received and is willing to continue to receive treatments for DM
4. HbA1c $\leq 10\%$ at the screening visit
5. IIEF-EF between 11~21 with maximum dose of oral PDE5i at the screening visit
6. ED history < 3 years
7. Diagnosed with ED at least 12 weeks prior to the screening visit

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Main Exclusion Criteria

1. Body mass index (BMI) ≥ 30 kg/m²
2. Hemoglobin A1c (HbA1c) > 10%
3. Has received cytotoxic agent, chemotherapy, or radiotherapy for other malignancies than prostate cancer within 4 weeks prior to the screening visit
4. ED due to structural abnormality of the penis such as Peyronie's disease or judged by the investigator
5. Received any penile implant
6. Had any surgery at the penile area within 24 weeks prior to the screening visit
7. Any of the following medical history, medications, or dietary contraindicated for taking Tadalafil
8. Any drug-induced or psychogenic erectile dysfunction within 4 weeks prior to the screening visit

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Indication	Diabetes Mellitus (DM)-Associated Erectile Dysfunction (ED)
Study Design	Phase I, Randomized, single-Blinded , and multiple centers study
Study Intervention	intracavernous injection of exosome or buffer every week for 6 weeks Combine with Tadalafil (QD) Follow up duration: 1 Year after injection
Study Population	Subjects with DM-associated ED
Arm	Experimental: Intervention : Exosome + Tadalafil Placebo: formulation buffer + Tadalafil
	Complete enroll 40 subjects within 1 year
Primary Endpoint	Change from baseline of the IIEF-EF score at 3 or 6M



臺北醫學大學
泌尿腎臟研究中心
TMU Research Center of
Urology and Kidney

Endpoints - Efficacy

- Efficacy Endpoints**

1st : IIEF-EF Domain, Change from Baseline at 3 or 6M

2nd : 其他性功能量表，Penile Doppler的變化

Visit	Screening	Treatment	Evaluation					Long-term FU	
	V1	V2	V3	V4	V5	V6	V7	V8	V9/EOS
Week	N/A	0	1	2	4	12	24	36	52
IIEF	X	X			X	X	X	X	X
EHS	X	X			X	X	X	X	X
SEP		X			X	X	X	X	X
GAQ					X	X	X	X	X
Penile Doppler (Optional)	X						X		X

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