



Molekulare Auswirkungen der extrakorporalen Stoßwellentherapie mit niedriger Intensität (LI-ESWT) auf die Harnblase in einem experimentellen diabetischen Rattenmodell

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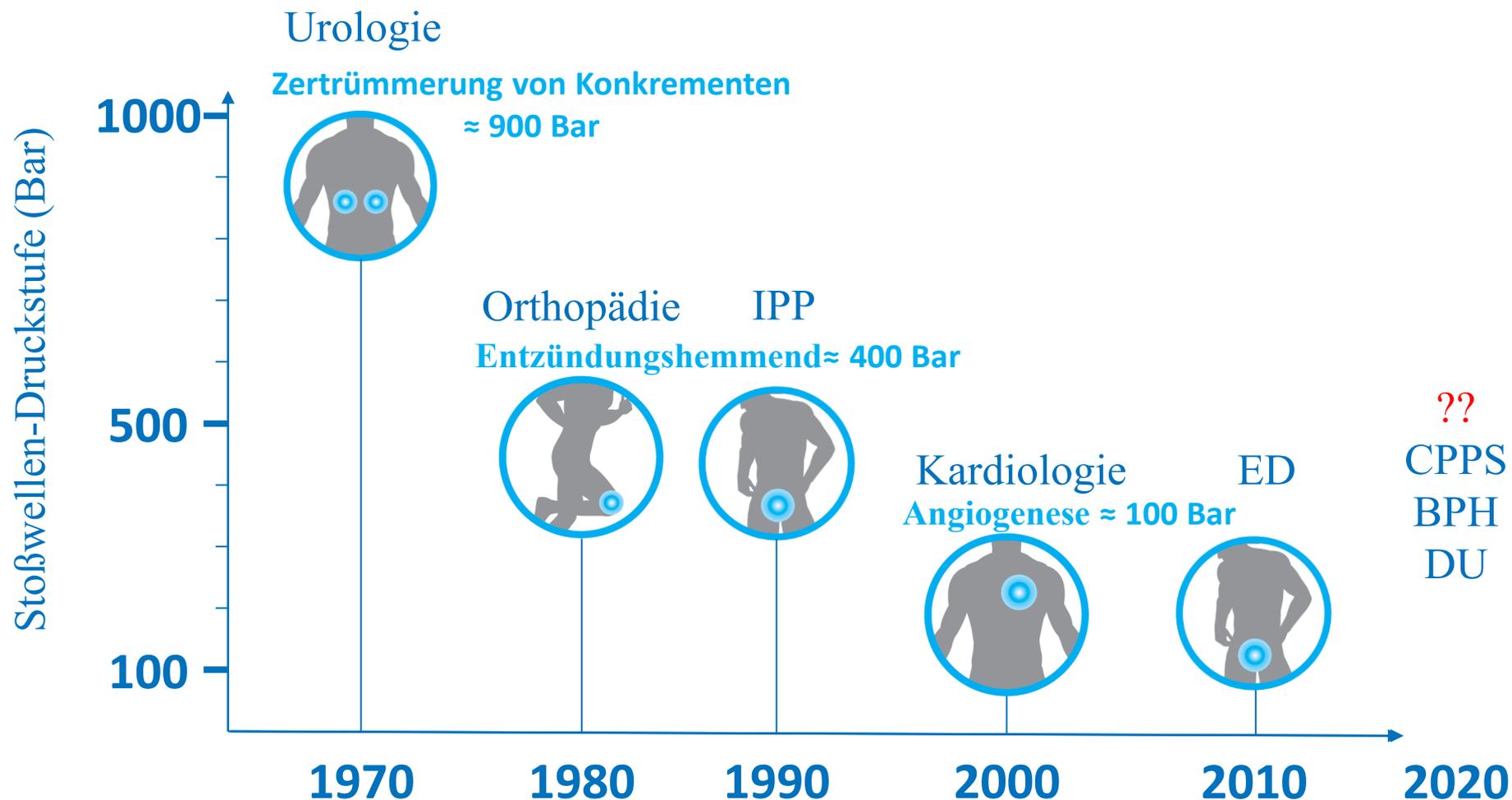
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Funktionsoberarzt

Klinik und Poliklinik für Urologie und Kinderurologie, U.K.W.
Direktor: Prof. Dr. H. Kübler

Conflict of Interest

Medispec Ltd, Israel stellte das Gerät und die Applikatoren für die Studie zur Verfügung.

Anwendung von extrakorporalen Stoßwellen in Medizin



LI-ESWT verbessert die Erektionsfunktion

- ▶ 10 RCTs
- ▶ \uparrow IIEF-EF score: +3,97;
95%CI[2,09-5,84]; $p < 0,0001$
- ▶ \uparrow EHS ≥ 3 : OR: 4,25
95%CI[1,82-10,00]; $p < 0,0009$
- ▶ \uparrow Spermatic Velocity: +4.12;
95%CI[2.30-5.94]; $p < 0.00001$

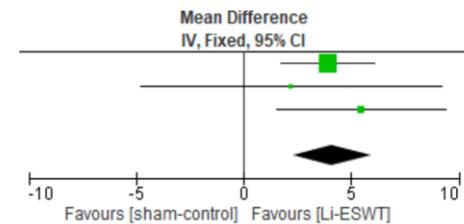
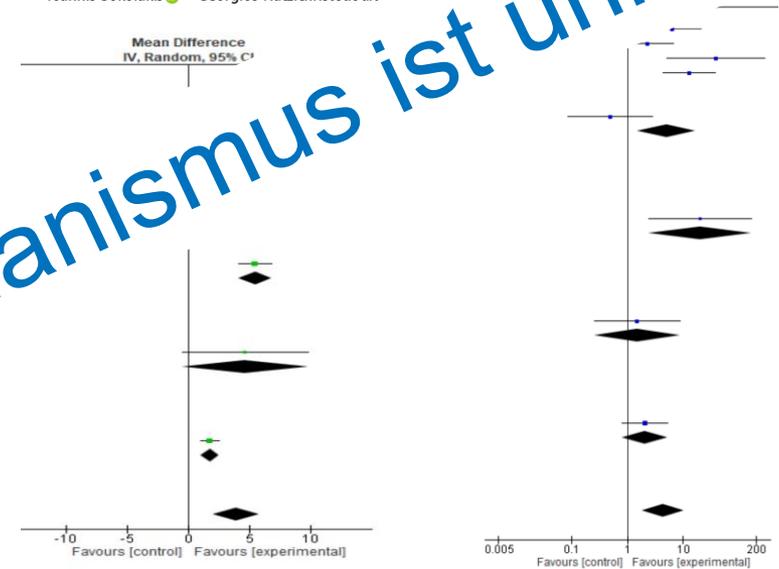
Der genaue Wirkmechanismus ist unklar!

UJR: Your Sexual Medicine Journal
<https://doi.org/10.1038/s41443-019-0117-z>

REVIEW ARTICLE

Clinical studies on low intensity extracorporeal shockwaves for erectile dysfunction: a systematic review and meta-analysis of randomised controlled trials

Ioannis Sokolakis¹ · Georgios Hatzichristodoulou¹



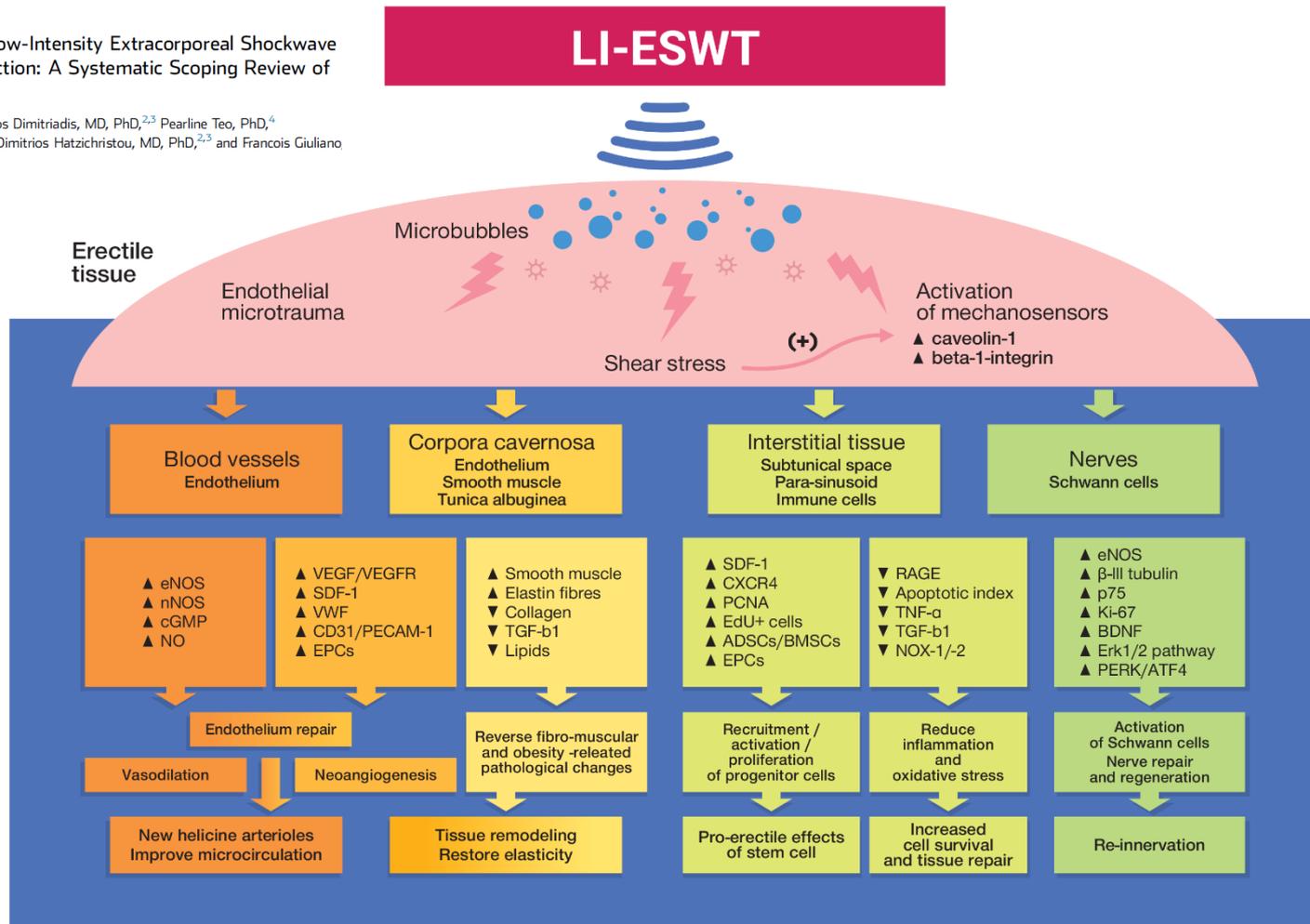
Sokolakis I & Hatzichristodoulou G. Int J Impot Res 2019;31:177-94.

Vermutlicher Wirkmechanismus

REVIEW

The Basic Science Behind Low-Intensity Extracorporeal Shockwave Therapy for Erectile Dysfunction: A Systematic Scoping Review of Pre-Clinical Studies

Ioannis Sokolakis, MD, PhD, MSc,^{1,2} Fotios Dimitriadis, MD, PhD,^{2,3} Pearline Teo, PhD,⁴ Georgios Hatzichristodoulou, MD, PhD,¹ Dimitrios Hatzichristou, MD, PhD,^{2,3} and Francois Giuliano



Wirkung von Li-ESWT nur am Penis?

1. CPPS (Abakterielle Prostatitis/chronisches Beckenschmerzsyndrom)

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REVIEW ARTICLE

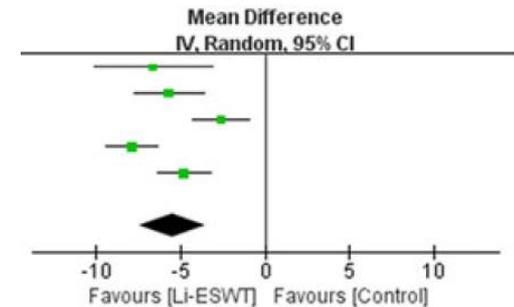


Efficacy of low-intensity extracorporeal shock wave therapy for the treatment of chronic prostatitis/chronic pelvic pain syndrome: A systematic review and meta-analysis

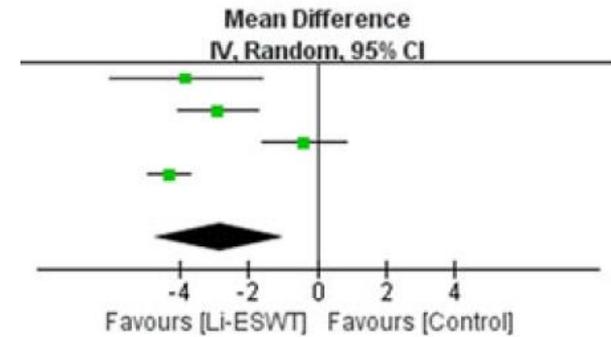
Penghui Yuan^{1,2} | Delin Ma³ | Yucong Zhang^{1,2} | Xintao Gao^{1,2} | Zhuo Liu^{1,2} | Rui Li^{1,2} | Tao Wang^{1,2} | Shaogang Wang^{1,2} | Jihong Liu^{1,2} | Xiaming Liu^{1,2}

Reference	Sample size	Study dates	Follow-up week	Age	Pain domain	Urinary score	Quality of life	NIH-CPSI	Parameters
Zimmermann ²⁴	30/30	N/A	12	42.0/43.0	5.33/5.73 ^a	N/A	N/A	23.20/25.07	3000impulses 0.25 mJ/mm ² , 3 Hz
Xiaoyong ²³	40/40	2009.8-2011.5	12	48.7/46.3	15.6/14.7	4.4/4.7	10.5/9.9	30.5/29.3	2000impulses 0.06mJ/mm ² , 2 Hz
Vahdatpour ²² + Moayednia ¹⁹	20/20	2011.10-2012.10	24	35.4/37.0	13.8/13.6	4.6/5.2	8.1/8.3	26.5/27.1	3000impulses 0.25-0.4 mJ/mm ² , 3 Hz
Pajovic ²⁰	30/30	2013.9-2015.2	24	39.4/39.4	15.9/14.5	5.03/5.76	9.96/9.1	31.06/29.3	3000impulses ^b 0.25 mJ/mm ² , 3 Hz
Salama ²¹	20/20	2015.12-2017.11	8	37.6/35.1	12.0/12.8	5.8/5.1	8.35/8.15	26.15/26	3000impulses 3 Hz

NIH-CPSI



Schmerzen



Yuan P, et al. NeuroUrol Urodyn. 2019;38: 1457-66.

1. CPPS (Abakterielle Prostatitis/chronisches Beckenschmerzsyndrom)
2. Detrusorunteraktivität und unteraktive Blase

BJUI
BJU International

Low-intensity extracorporeal shockwave therapy ameliorates diabetic underactive bladder in streptozotocin-induced diabetic rats

Hsun Shuan Wang*^{1,2} , Byung Seok Oh*, Bohan Wang* , Yajun Ruan* , Jun Zhou*, Lia Banie*, Yung Chin Lee*^{1,2}, Arianna Tamaddon*, Tie Zhou*, Guifang Wang*, Guiting Lin* and Tom F. Lue*

International Urology and Nephrology
<https://doi.org/10.1007/s11255-019-02095-4>

UROLOGY - ORIGINAL PAPER

Long-term functional change of cryoinjury-induced detrusor underactivity and effects of extracorporeal shock wave therapy in a rat model

WILEY Yao-Chi Chuang^{1,2} , Pradeep Tyagi³, H. L. Luo¹, Wei-Chia Lee¹, Hung-Jen Wang^{1,2}, Chao-Cheng Huang⁴, Michael B. Chancellor⁵

ORIGINAL BASIC SCIENCE ARTICLE

Low-intensity extracorporeal shock wave therapy promotes myogenesis through PERK/ATF4 pathway

Bohan Wang^{1,2} , Jun Zhou¹, Lia Banie¹, Amanda B. Reed-Maldonado¹, Hongxiu Ning¹, Zhihua Lu¹, Yajun Ruan¹, Tie Zhou¹, Hsun Shuan Wang¹, Byung Seok Oh¹, Guifang Wang¹, Stanley Lei Qi³, Guiting Lin¹, Tom F. Lue¹

Chuang YC, et al. Int Urol Nephrol. **2019**;51: 617-26
Wang B, et al. Neurourol Urodyn. **2018**;37: 699-707
Wang HS, et al. BJU Int. **2018**;122: 490-500

1. CPPS (Abakterielle Prostatitis/chronisches Beckenschmerzsyndrom)
2. Detrusorunteraktivität und unteraktive Blase
3. Stress-Inkontinenz
4. Interstitielle Zystitis
5. OAB
6. BPH

Original Article

Radial Extracorporeal Shock Wave Therapy as a Novel Agent for Benign Prostatic Hyperplasia Refractory to Current Medical Therapy

Dai Zhang, MM¹, Yun-Lei Wang, MM¹, Da-Xin Gong, MD², Zhao-Xuan Zhang, MM¹, Xiao-Tong Yu, MD³, and Yue-Wen Ma, MD¹

American Journal of Men's Health
January-February 2019; 1–7
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DOI: 10.1177/1557988319831899
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VOIDING DYSFUNCTION/FEMALE UROLOGY: ORIGINAL ARTICLE

OPEN ACCESS 

Delivery of intravesical botulinum toxin A using low-energy shockwave in the treatment of overactive bladder: A preliminary clinical study

Mohammed Nageib, Ahmed S. El-Hefnawy, Mohamed H. Zahran , Nasr A. El-Tabey, Khaled Z. Sheir and Ahmed A. Shokeir

Original Article

Treatment of stress urinary incontinence with low-intensity extracorporeal shock wave therapy in a vaginal balloon dilation induced rat model

Alex K. Wu, Xiaoyu Zhang, Jianwen Wang, Hongxiu Ning, Uwais Zaid, Jaqueline D. Villalta, Guifang Wang, Lia Banic, Guiting Lin, Tom F. Lue

ORIGINAL BASIC SCIENCE ARTICLE

WILEY   

Effects of low energy shock wave therapy on inflammatory moleculars, bladder pain, and bladder function in a rat cystitis model

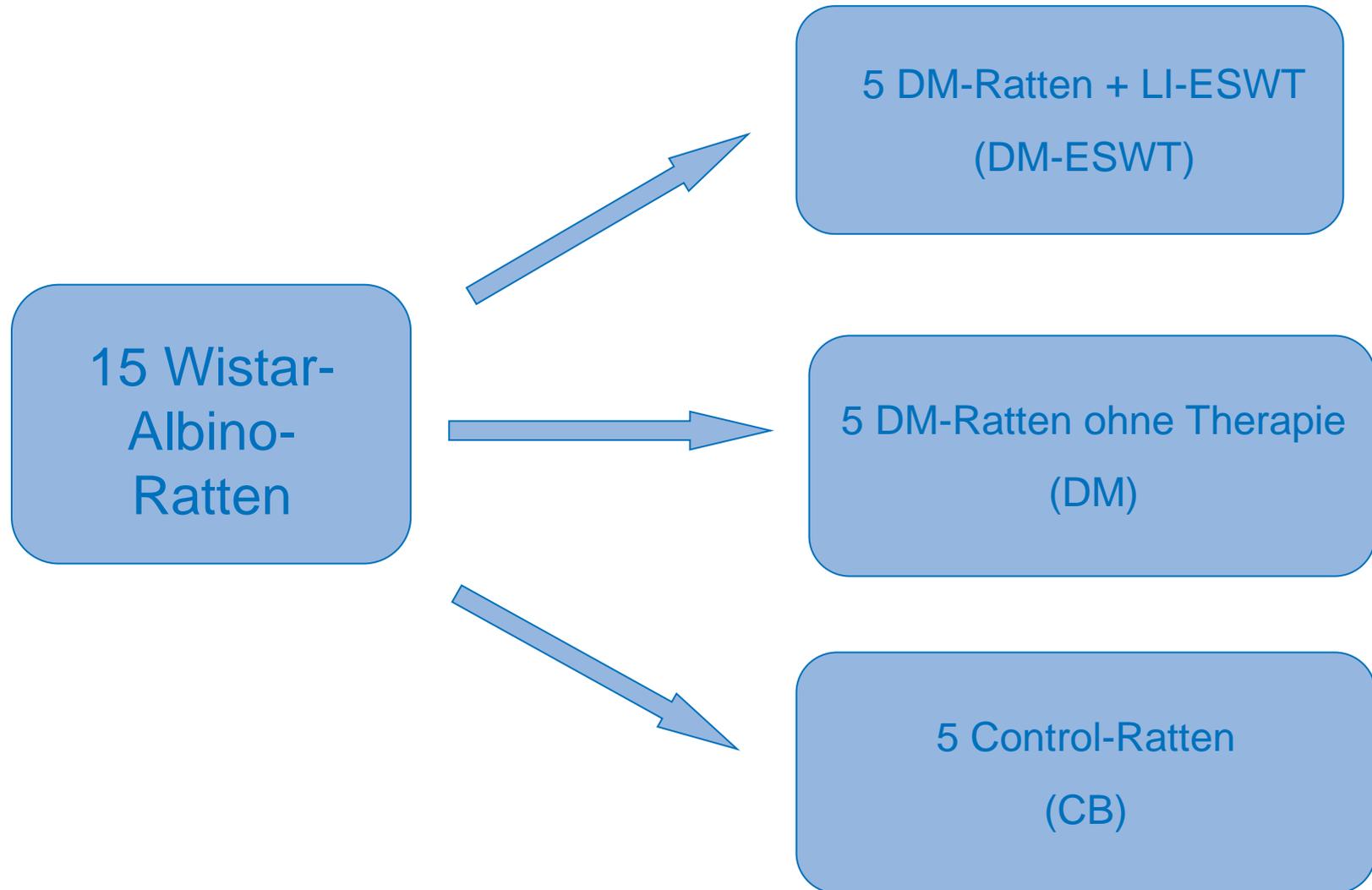
Hung-Jen Wang^{1,2} | Wei-Chia Lee¹ | Pradeep Tyagi³ | Chao-Cheng Huang⁴ | Yao-Chi Chuang^{1,2,5*}

Nageib M, et al. Arab J Urol. **2019**;17:216-20
Zhang D, et al. Am J Mens Health. **2019**;Epub
Wang HJ, et al. Neurorol Urodyn. **2017**;36:1440-47
Wu AK, et al. Transl Androl Urol. **2018**;7:S7-S16

Ziel

- ▶ Die Auswirkung von LI-ESWT auf die Harnblase in einem experimentellen diabetischen Rattenmodell zu untersuchen.

Material und Methode (1)



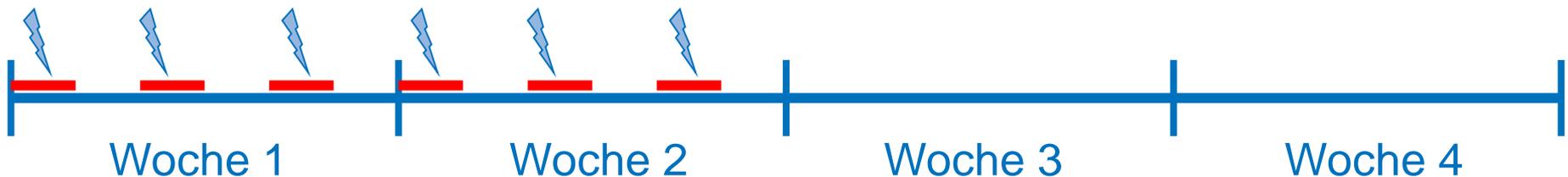
Material und Methode (2)



Material und Methode (3)



Bei allen Ratten in der DM+LI-ESWT Gruppe wurden 3 Mal wöchentlich je 300 Stoßwellen pro Sitzung (Zeitraum: 2 Wochen) appliziert (Energiedosis: $0,09\text{mJ}/\text{mm}^2$, 2Hz)



Sokolakis I et al. Int J Impot Res **2019**;31:162-69.

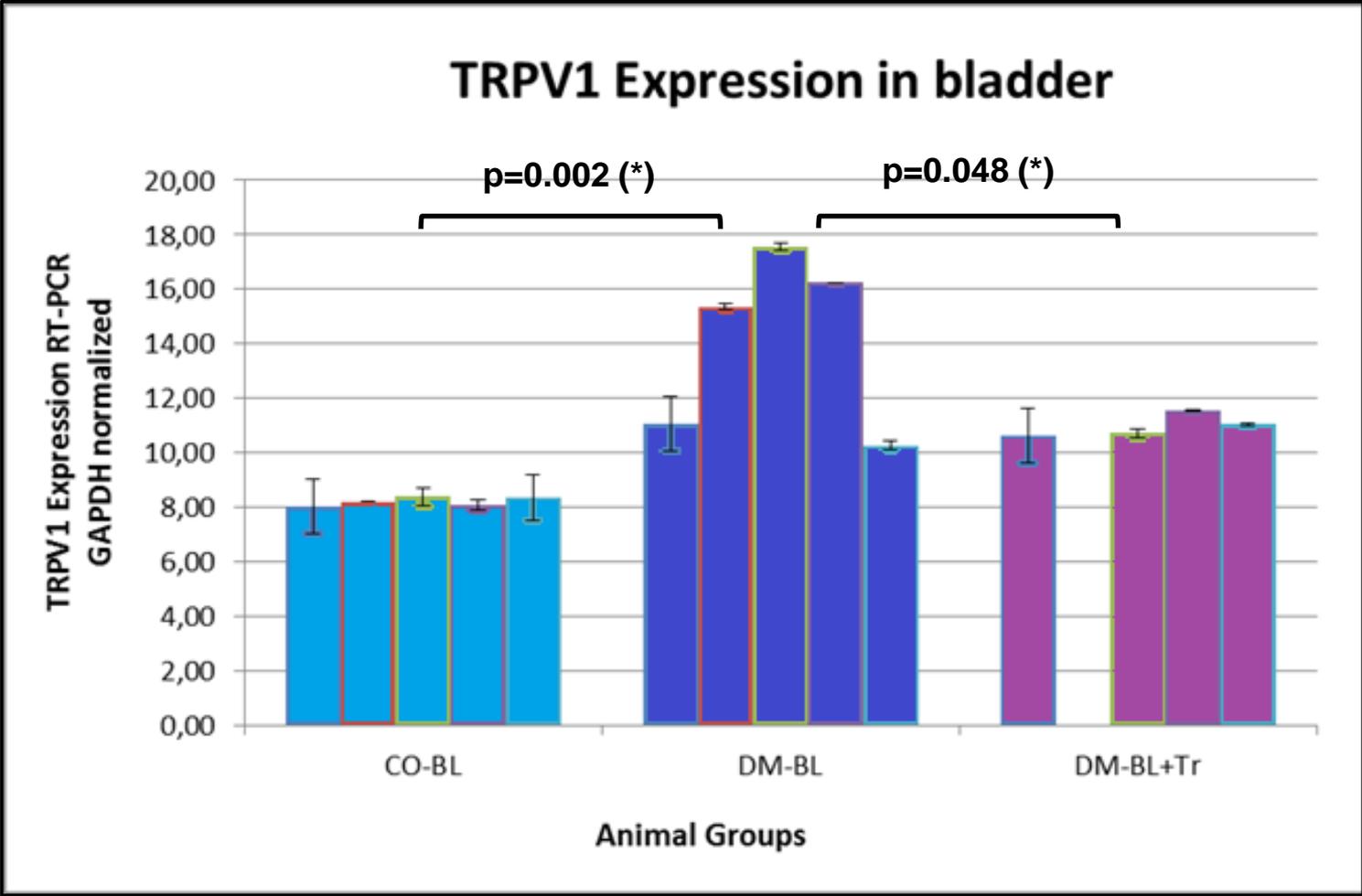
Material und Methode (4)

Zwei Wochen nach Abschluss wurde die Expression von:

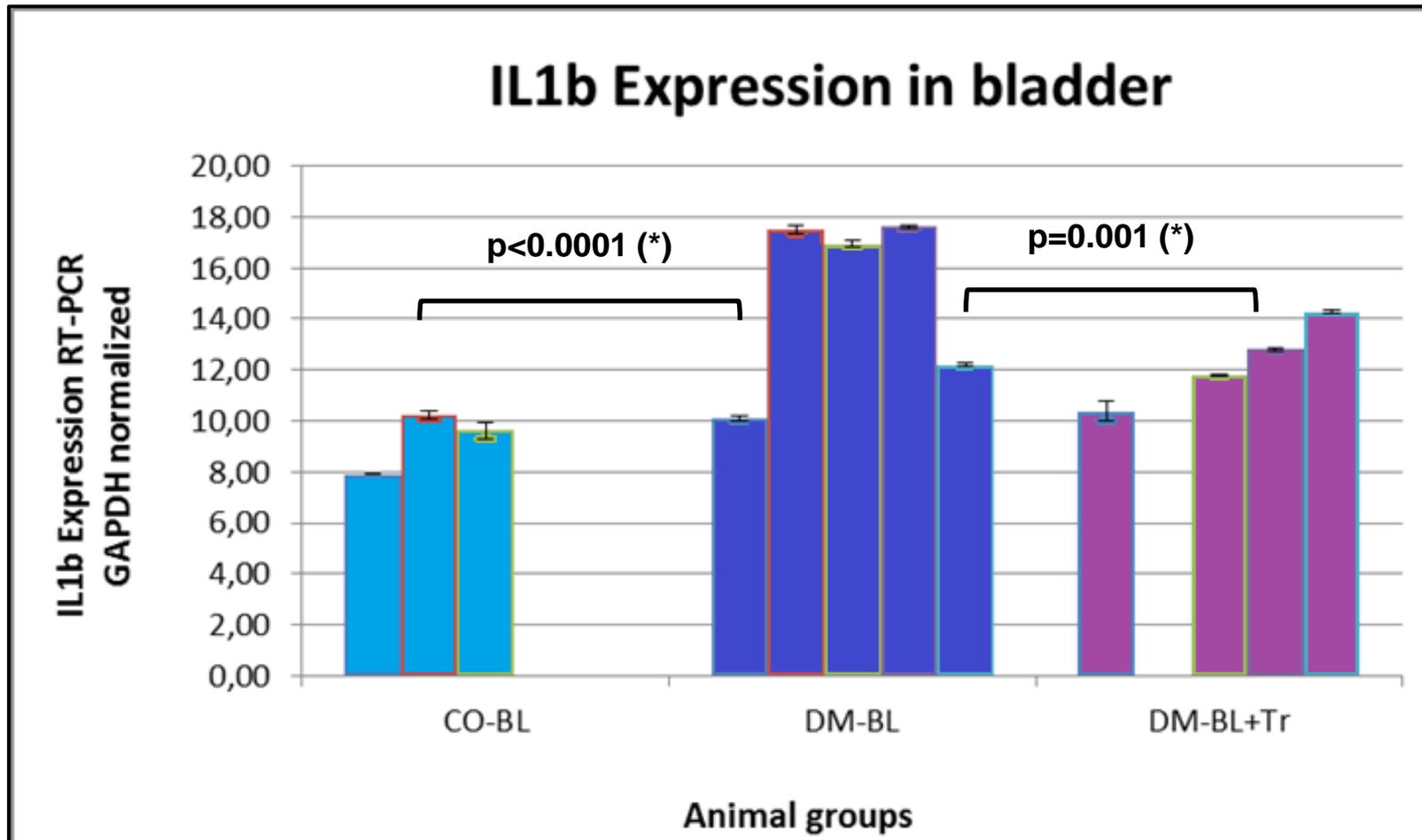
- a) **TRPV1** (Transiente Rezeptor-Potential-Kationenkanal der Unterfamilie Vanilloid, Subtyp 1) oder (Vanilloid Receptor 1)
- b) **IL-1b** (Interleukin 1b)
- c) **Chrm1** (muskarinischer Rezeptor 1; M1)
- d) **Chrm2** (muskarinischer Rezeptor 2; M2)
- e) **Chrm3** (muskarinischer Rezeptor 3; M3)

in der Harnblase mittels Real-time PCR (mRNA) untersucht.

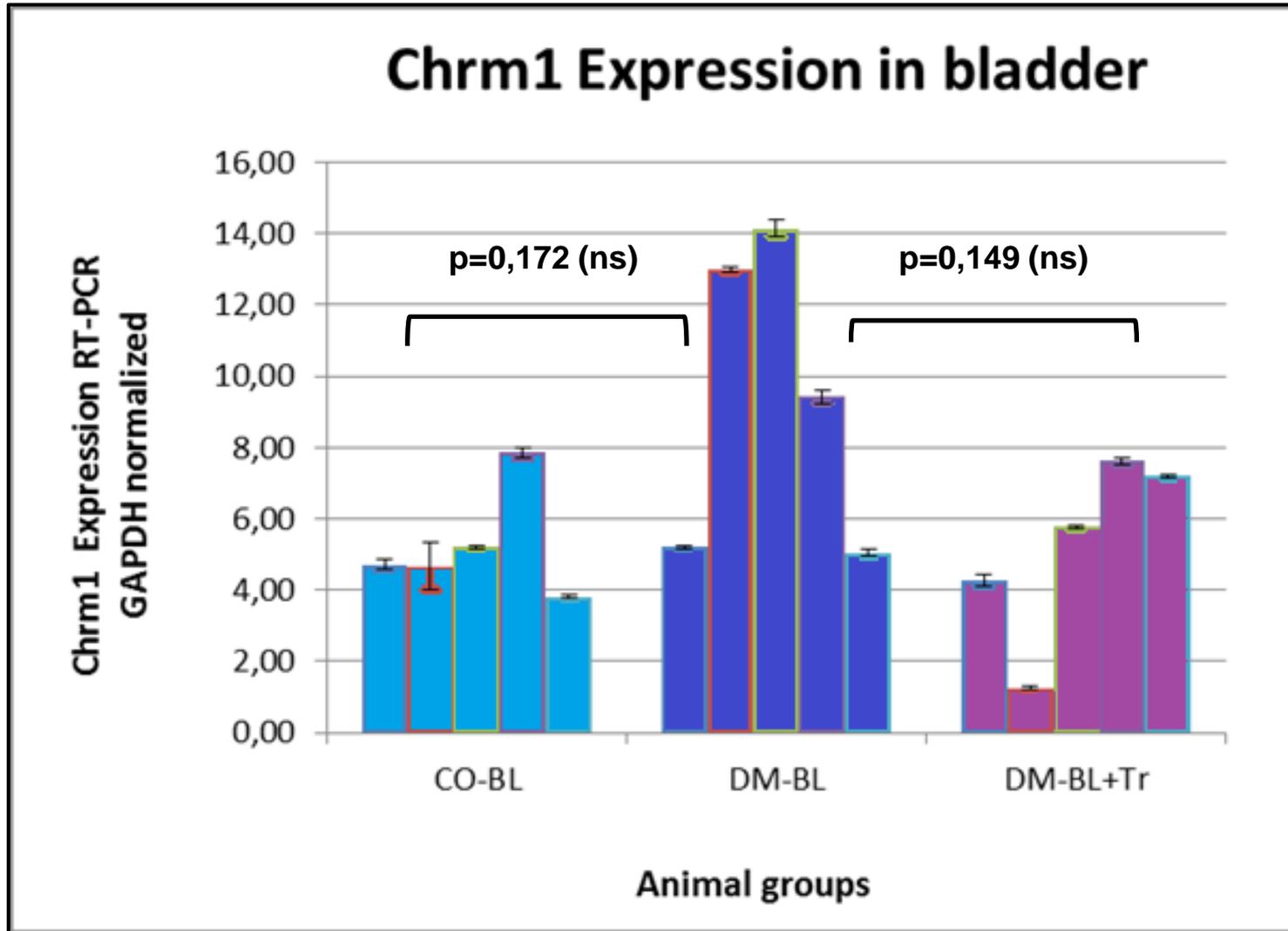
Ergebnisse (1)



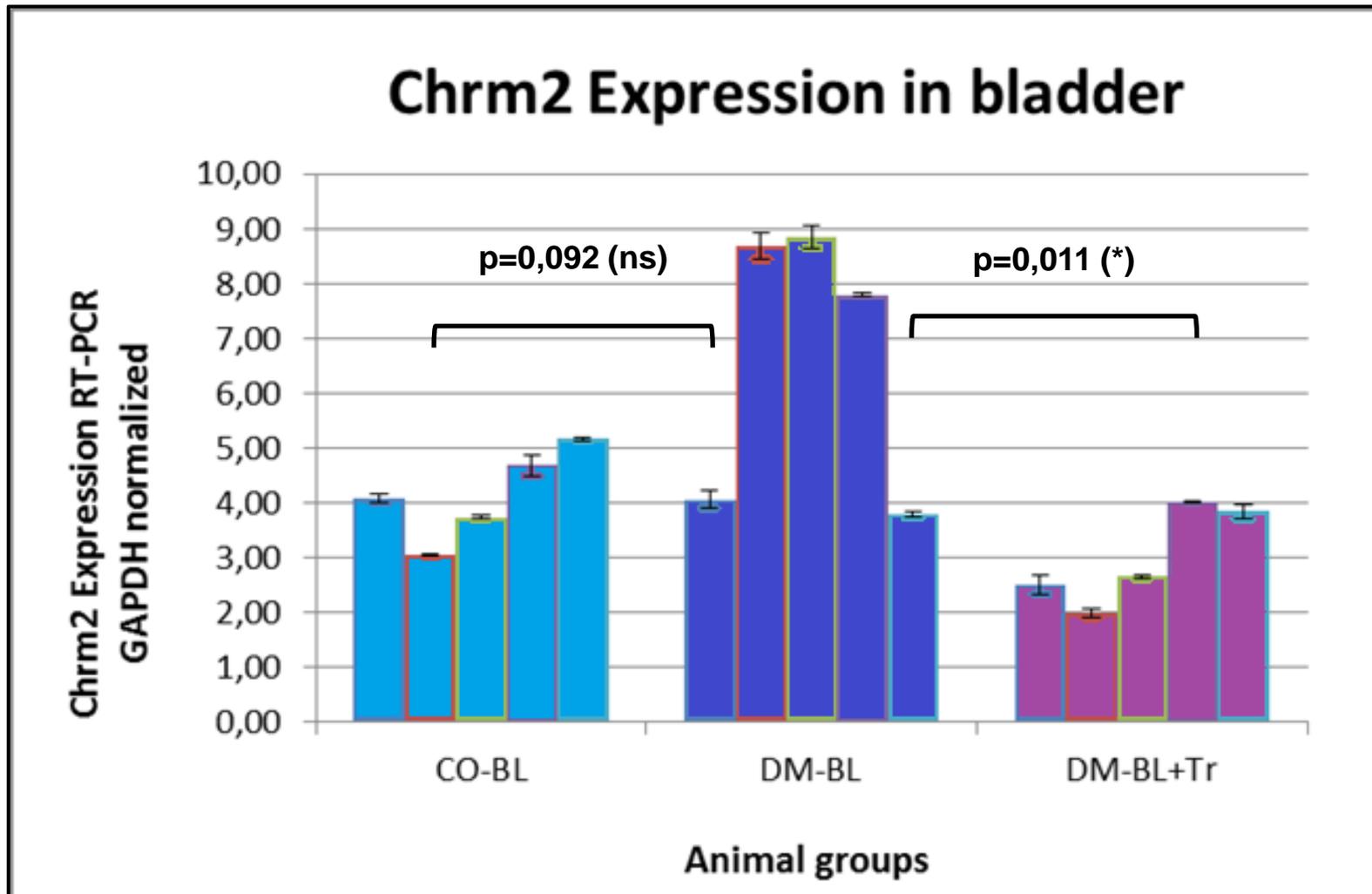
Ergebnisse (2)



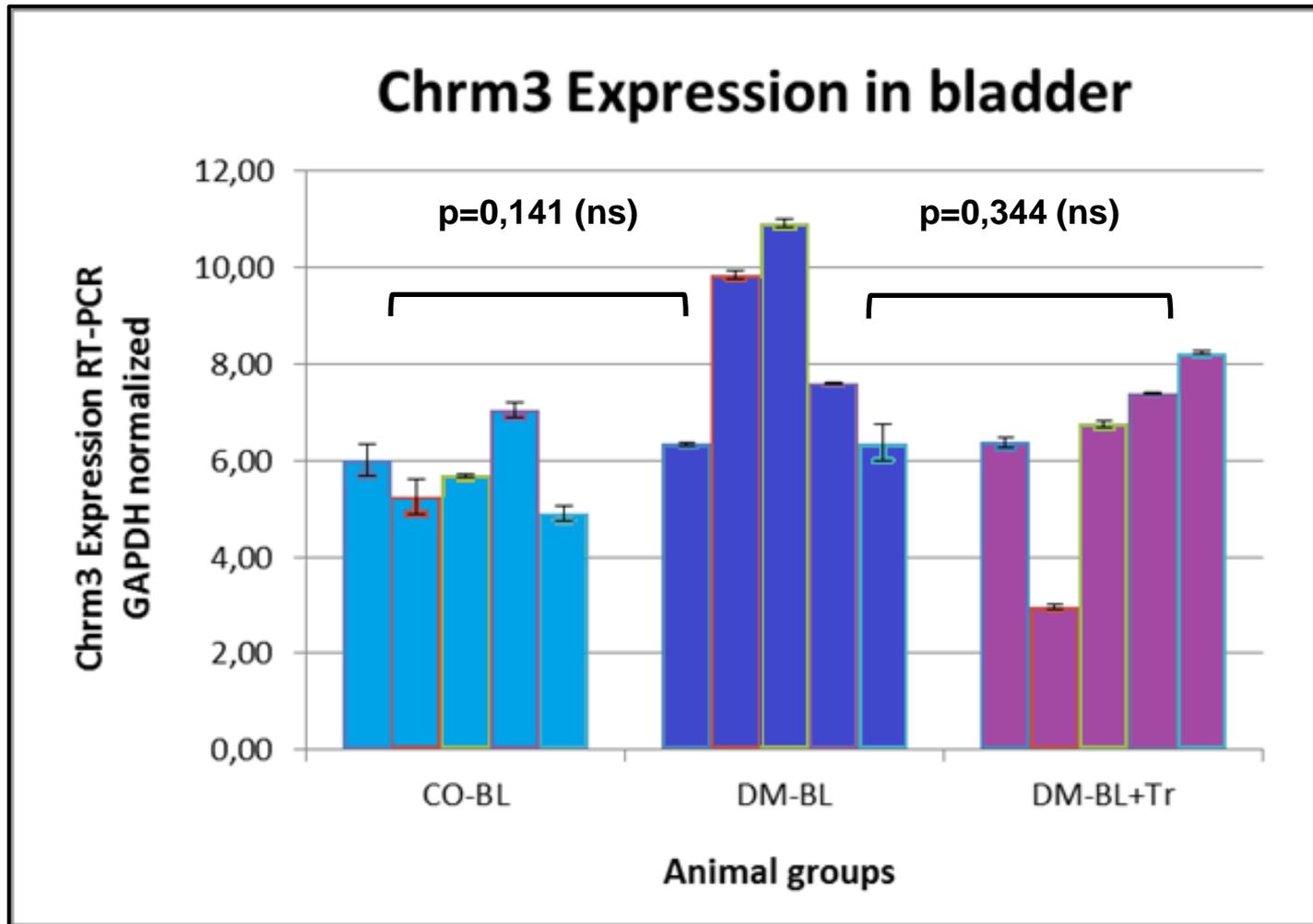
Ergebnisse (3)



Ergebnisse (4)



Ergebnisse (5)



Schlussfolgerung

- ▶ Diabetes mellitus scheint die Expression von Genen zu erhöhen, die mit Kontraktion (M2), Entzündung / Ischämie (IL-1b) und Blasenreizbarkeit (VR1) zusammenhängen.
- ▶ Die LI-ESWT reduzierte in einem diabetischen Rattenmodell die Genexpression der beobachteten Marker – und konnte nahezu Normalverhältnisse wiederherstellen.
- ▶ Mögliche Therapieoption für die diabetische Zystopathie.

An aerial photograph of a city, likely Göttingen, Germany, showing a dense urban area with a prominent university campus. The campus features several large, multi-story buildings with red-tiled roofs and a central tower. The city is surrounded by green spaces and fields. A major highway with multiple lanes is visible in the foreground, curving around the city. The entire image is overlaid with a semi-transparent blue filter. The text "Vielen Dank für Ihre Aufmerksamkeit!" is centered in the middle of the image in a dark blue font.

Vielen Dank für Ihre Aufmerksamkeit!