

OptiMSM®

# Efficacy Highlights



# MSM Has Proven Advantages for Joint Health

Author/ Publication	Study Design & Subject Population	Duration/ Dosage	Outcome Measures	Conclusions
Toguchi A, et al., Nutrients 2023; 15: 2995.	Randomized, double-blind, placebo-controlled trial  N=88 M/F w/mild knee pain, age 20y+	<b>12 weeks</b> • Placebo • 2000 mg/day OptiMSM	JKOM score	• OptiMSM significantly improved overall joint health and comfort relative to placebo
Debbi EM, et al., BMC Comp Alt Med 2011; 11:50	Randomized, double-blind, placebo-controlled trial  N=49 M/F w/ OA, age 45-90y	<b>12 weeks</b> • Placebo • 3375 mg/day MSM	WOMAC score Joint stiffness Joint pain Joint function	• MSM supplementation for 12 weeks significantly improved markers of joint function
Kim LS, et al., Osteoarthritis Cartilage 2006; 14(3): 286-294.	Randomized, double-blind, placebo-controlled trial  N=50 M/F w/ OA, age 40-76y	<b>12 weeks</b> • Placebo • 6000 mg/day MSM	WOMAC score Joint pain Joint function Activities of daily living	• MSM supplementation significantly improved markers of joint comfort and physical function
Lubis AMT, et al., Acta Med Indones 2017; 49(2): 105-111.	Randomized, double-blind, placebo-controlled trial  N=147 M/F w/ OA; mean age = 61y	<b>3 months</b> • Placebo • 1500 mg GS + 1200 mg CS/day • 1500 mg GS + 1200 mg CS + 500 mg MSM/day	WOMAC score VAS	• Supplementation with GS + CS + MSM significantly improves markers of joint health and comfort
Pagonis TA, et al., Int J Orthopaed 2014; 23(1): 19-24.	Randomized, double-blind, placebo-controlled trial  N=100 M/F w/ OA	<b>26 weeks</b> • Placebo • 6000 mg/day MSM	WOMAC score Quality of life	• MSM supplementation significantly improved performance in activities of daily living and overall health-related quality of life
Usha PR & Naidu MUR. Clin Drug Invest 2004; 24(6): 353-363.	Randomized, double-blind, placebo-controlled trial  N=118 M/F w/ OA; age 40-70y	<b>12 weeks</b> • Placebo • 1500 mg GS/day • 1500 mg MSM/day • 1500 mg GS + 1500 mg MSM/day	Joint pain Joint swelling VAS pain	• GS + MSM supplementation significantly improved functional ability of joints

# MSM Has Proven Advantages for Athletes

Author/ Publication	Study Design & Subject Population	Duration/ Dosage		Outcome Measures	Conclusions
Barmaki S, et al., J Sports Med Phys Fitness 2012; 52: 170-174.	Randomized, double-blind, placebo-controlled trial  N=18 healthy, active young men	<b>10 days</b> <ul style="list-style-type: none"><li>• 50 mg MSM / kg body weight<ul style="list-style-type: none"><li>• Avg = 3895mg</li></ul></li><li>• Placebo</li></ul>		<b>Muscle Damage After 14km Run</b> <ul style="list-style-type: none"><li>• Serum CK</li><li>• TAC</li></ul>	<ul style="list-style-type: none"> <li>• MSM supplementation significantly reduced muscle damage after exercise in active adults</li> </ul>
Godwin S, et al., J Int Soc Sports Nutr 2015; 12 (suppl 1): P48 (abstract)	Placebo-controlled trial  N=5 recreationally active men	<b>28 days</b> <ul style="list-style-type: none"><li>• 3000 mg MSM</li><li>• Placebo</li></ul>		<b>Inflammation After Eccentric Exercise (knee ext)</b> <ul style="list-style-type: none"><li>• IL-6</li><li>• IL-1<math>\beta</math></li></ul>	<ul style="list-style-type: none"> <li>• MSM supplementation blunted the increase in the systemic levels of inflammatory cytokines (IL-6 and IL-1b) immediately after exercise</li> </ul>
Kalman D, et al., FASEB J 2013; 27: 1076.7 (abstract)	Randomized, double-blind, placebo-controlled trial  N=24 moderately exercise trained men	<b>14 days</b> <ul style="list-style-type: none"><li>• 3000 mg <b>OptiMSM</b></li><li>• Placebo</li></ul>	<b>OptiMSM</b>	<b>Leg Extension Exercise</b> Post-exercise pain <ul style="list-style-type: none"><li>• VAS</li></ul>	<ul style="list-style-type: none"> <li>• <b>OptiMSM</b> supplementation helped to alleviate pain that after exercise</li> </ul>
Nakhostin-Roohi B, et al., J Pharm Pharmacol 2011; 63: 1290-1294.	Randomized, double-blind, placebo-controlled trial  N=18 untrained men	<b>10 days</b> <ul style="list-style-type: none"><li>• 50 mg MSM / kg body weight<ul style="list-style-type: none"><li>• Avg = 3895mg</li></ul></li><li>• Placebo</li></ul>		<b>Ox. Stress After 14km Run</b> <ul style="list-style-type: none"><li>• Protein Carbonyl (PC)</li><li>• MDA</li><li>• Oxidized Glutathione</li><li>• Antiox. Capacity (GSH, GSH:GSSG)</li></ul>	<ul style="list-style-type: none"> <li>• MSM supplementation aided recovery from training by significantly reducing markers of muscle damage and improved antioxidant capacity after exercise among new athletes</li> </ul>
Nakhostin-Roohi B, et al., Ir J Pharm Res 2013; 12(4): 845-853.	Randomized, double-blind, placebo-controlled trial  N=16 untrained men	<b>Single dose, 24h</b> <ul style="list-style-type: none"><li>• 100 mg MSM / kg body weight<ul style="list-style-type: none"><li>• Avg = 7090 mg</li></ul></li><li>• Placebo</li></ul>		<b>Ox. Stress After 14km Run</b> <ul style="list-style-type: none"><li>• Protein Carbonyl (PC)</li><li>• Antiox. Capacity (TAC)</li></ul>	<ul style="list-style-type: none"> <li>• MSM supplementation significantly reduced oxidative stress and improved antioxidant capacity in new athletes</li> </ul>
van der Merwe M & Bloomer RJ. J Sports Med 2016; 7498359.	Double-blind, placebo-controlled trial  N=40 healthy, active male athletes	<b>28 days</b> <ul style="list-style-type: none"><li>• 3000 mg MSM</li><li>• Placebo</li></ul>	<b>OptiMSM</b>	<b>100 Eccentric Knee Extensions</b> Post-exercise immunosuppression <ul style="list-style-type: none"><li>• IL-6, IL-1<math>\beta</math>, TNF-<math>\alpha</math></li></ul>	<ul style="list-style-type: none"> <li>• MSM blunts post-exercise immunosuppression (IL-6, IL-1<math>\beta</math>, TNF-<math>\alpha</math>)</li> </ul>

# MSM Has Proven Advantages for Beauty

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Author/ Publication	Study Design & Subject Population	Duration/ Dosage		Outcome Measures	Conclusions
Anthonavage M, et al., Nat Med J 2015; 7(11): 1-10.	Randomized, double-blind, placebo-controlled trial  N=20 F, age 35-59y	<b>16 weeks</b> • Placebo • 3000 mg/day <b>OptiMSM</b>	<b>OptiMSM</b>	Skin wrinkles Skin firmness Skin texture	• <b>OptiMSM</b> supplementation significantly reduces the appearance of lines and wrinkles, and leads to improvements in the appearance of crow's feet, skin firmness, tone, and texture.
Guaitolini E, et al., J Clin Aesthet Dermatol 2019; 12(4): 40-45.	Randomized, single-blind, placebo-controlled trial  N=50 F, age 40-65y with skin chronoaging and/ or photoaging	<b>60 days</b> • Placebo • Intervention (200 mg HA + 500 mg L-carnosine + 400 mg MSM/day)	<b>OptiMSM</b>	Skin hydration Skin elasticity Sebometry	• Supplementation with the intervention formulation significantly improved skin hydration and elasticity, and significantly reduced the depth of wrinkles.
Muizzuddin N & Benjamin R. Nat Med J 2019; 11(11): 1-8.	Double-blind clinical trial  N=63 F, age 35-59y	<b>4 months</b> • 1000 mg/day <b>OptiMSM</b> • 3000 mg/day <b>OptiMSM</b>	<b>OptiMSM</b>	Hair condition assessment Nail condition assessment	• <b>OptiMSM</b> supplementation significantly improved the appearance and condition of hair and nails. Supplementation with 3000 mg/day provided greater benefits compared to 1000 mg/day.
Muizzuddin N & Benjamin R. Int J Vitam Nutr Res 2022; 92(3-4), 182-191.	Double-blind, placebo-controlled trial  <b>Part I:</b> n=20 F, age 35-59y  <b>Part II:</b> n=63 F, age 35-59y	<b>Part I:</b> 4 months • Placebo • 3000 mg/day <b>OptiMSM</b>  <b>Part II:</b> 4 months • 1000 mg/day <b>OptiMSM</b> • 3000 mg/day <b>OptiMSM</b>	<b>OptiMSM</b>	<b>Parts I &amp; II:</b> Facial wrinkles Skin roughness	• <b>OptiMSM</b> supplementation provided significant benefits for skin health, including a reduction in the appearance of facial wrinkles (crow's feet), with differences observed as early as 8 weeks.
Simpson P, Benjamin R. J Clin Exp Dermatol Res 2022; 13(5): 1000622.	Randomized, double-blind, placebo-controlled trial  N=58 F, age 41-65y	<b>12 weeks</b> • Placebo • 1000 mg/day <b>OptiMSM</b> • 1000 mg <b>OptiMSM</b> + 2500 mg HFC/day	<b>OptiMSM</b>	Skin wrinkles Skin elasticity	• <b>OptiMSM</b> supplementation, with or without HFC, significantly improved skin smoothness in as early as 6 weeks • <b>OptiMSM</b> + HFC supplementation significantly improved skin elasticity
Benjamin R, et al., Nat Med J 2023; 15(10).	Single group intervention study  N=41 M/F, age 19-60y, w/telogen effluvium hair loss	120 days 1000 mg/day <b>OptiMSM</b>	<b>OptiMSM</b>	Hair count Hair diameter Self-assessment	• <b>OptiMSM</b> supplementation significantly improved hair growth and thickness of hair follicles. Additional data needed to confirm effect.



# MSM Has Proven Bioavailability

Author/ Publication	Study Design & Subject Population	Duration/ Dosage		Outcome Measures	Conclusions
Bloomer RJ, et al., J Nutr Food Sci 2019; 9:1	Randomized intervention trial  N=45 adult M/F	<b>16 weeks</b> • 1000 mg OptiMSM • 2000 mg OptiMSM • 3000 mg OptiMSM	OptiMSM	Plasma MSM	• OptiMSM significantly elevated serum MSM concentrations, with peak concentrations reached within 4 weeks
Kalman DS & Hewlings SJ. EC Nutrition 12.11 (2018): 6840695.	Randomized, open-label, crossover, pharmacokinetic trial  N=6 healthy adult M	<b>4 hours</b> • 1000 mg OptiMSM • 2000 mg OptiMSM • 3000 mg OptiMSM	OptiMSM	OptiMSM Pharmacokinetics • Cmax • Tmax • MSM AUC	• OptiMSM significantly elevated serum MSM concentrations within 45 minutes of supplementation
Miller L, et al., Nutrients 2021; 13, 3620.	Randomized, double-blind, placebo-controlled trial  N=22 overweight/obese M/F	<b>16 weeks</b> • Placebo • 3000 mg OptiMSM	OptiMSM	Serum MSM	• OptiMSM supplementation significantly improved serum MSM concentrations, with the first measurement recorded at 4 weeks and persisting through 16 weeks

# Thanks

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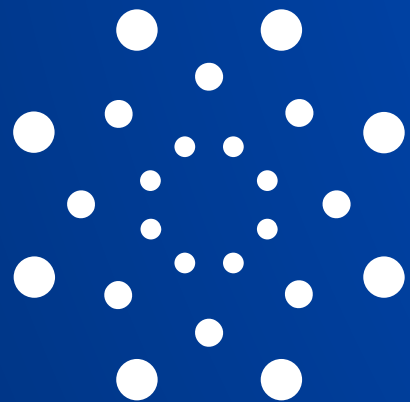
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