

## ラット摘出低酸素化心筋モデルにおける タンシノン 6 誘導体の影響

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### Effects of Tanshinone VI Derivatives on Post-Hypoxic Contractile Dysfunction of Perfused Rat Hearts

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**Abstract** The present study was undertaken to elucidate the effects of sodium tanshinone VI 1-phenolate (1), 1'-O-hydrogen succinyltanshinone VI 1-O-hydrogen succinate (2), and disodium 1'-O-succinyltanshinone VI 1-O-succinate (3), water-soluble derivatives of tanshinone VI, on post-hypoxic contractile recovery of isolated perfused rat hearts. The effects were compared with those of tanshinone VI as tested previously. The hearts were perfused for 20 min under hypoxic conditions, followed by 45 min reoxygenation, and their cardiac performance was determined. Changes in tissue sodium, potassium, calcium, and magnesium contents after reoxygenation, and release of creatine kinase and purines and bases (ATP metabolites) during hypoxia/reoxygenation were also examined. The derivatives were dissolved in a Krebs-Henseleit buffer and administered at concentrations of 42 nM into the buffer. Hypoxia/reoxygenation resulted in slight recovery of cardiac contractile force, significant alterations in tissue ion concentrations, and pronounced release of creatine kinase and ATP metabolites, hypoxia/reoxygenation-induced functional and morphological damage. The tanshinone VI derivatives improved post-hypoxic contractile recovery, which was associated with restoration of tissue ionic concentrations, and diminishment of the release of creatine kinase and ATP metabolites from the hypoxic/reoxygenated hearts. The efficacy of these compounds was similar to that of tanshinone VI. The results suggest that water-soluble tanshinone VI derivatives, like tanshinone VI

itself, are beneficial for hypoxia/reoxygenation injury.

丹参成分のうちタンシノン6がラット虚血心筋の修復を有意に改善した。そこで以下の水溶性タンシノン誘導体を合成した。タンシノン6-フェノレート、タンシノン6-コハク酸およびタンシノン6-コハク酸ナトリウム塩。これら化合物について虚血時における心筋収縮力、組織におけるNa,K,Ca,Mg含量の違い、クレアチンキナーゼやATP代謝物の変動を検討した。その結果、水溶性タンシノン6-フェノレートがタンシノン6と同様の効力を示すとが判明した。

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