Basic evaluation of $^{67}$Ga labeled digoxin derivative as a metal-labeled bifunctional radiopharmaceutical

Yasuhiro Fujibayashi,** Yasutaka Takemura,† Hideyuki Taniuchi,* Naoko Iwama,* Junji Konishi** and Akira Yokoyama*

*Faculty of Pharmaceutical Sciences and **School of Medicine, Kyoto University, Kyoto, Japan

To develop metal-labeled digoxin radiopharmaceuticals with affinity with anti-digoxin antibody as well as Na⁺,K⁺-ATPase, a digoxin derivative conjugated with deferoxamine was synthesized. The derivative had a high binding affinity with $^{67}$Ga at deferoxamine introduced to the terminal sugar ring of digoxin. The $^{67}$Ga labeled digoxin derivative showed enough in vitro binding affinity and selectivity to anti-digoxin antibody as well as Na⁺,K⁺-ATPase. The $^{67}$Ga labeled digoxin derivative is considered to be a potential metal-labeled bifunctional radiopharmaceutical for digoxin RIA as well as myocardial Na⁺,K⁺-ATPase imaging.

Key words: digoxin, radiopharmaceutical, deferoxamine, radioimmunoassay, Na⁺,K⁺-ATPase