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## Transmural effects of diabetes on contraction and calcium transport in left ventricle of diabetic rat heart

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The left ventricle of the heart pumps blood at higher pressure than the right; the electromechanical properties of ventricular myocytes vary transmurally. The differences in electromechanical properties could be related to differences in stress and strain across the walls of the ventricles. Many studies have reported that muscle contraction and electrical conduction are frequently altered in the diabetic heart and disturbances in calcium transport partly underlie mechanical dysfunction in the diabetic heart. To date, most of the single cell studies in diabetic heart have been performed in myocytes that have been isolated from whole ventricle. Very little is known about the transmural effects of diabetes on the heart. A recent study performed in our laboratory investigated the contraction and calcium transport in epicardial (EPI) and endocardial (ENDO) myocytes from left ventricle of streptozotocin (STZ)-induced diabetic rat heart. These experiments were performed in relatively young animals after 12 weeks of STZ treatment. Differences were observed in the time course of contraction and calcium transport in EPI and ENDO ventricular myocytes of diabetic heart compared to control heart. We are currently using video edge detection, fluorescence photometry and whole-cell patch-clamp techniques to investigate contraction and calcium transport in EPI and ENDO myocytes isolated from left ventricle in two experimental models of diabetes. The STZ-induced diabetic rat, a model of type 1, after 20 weeks of STZ treatment and the Goto-Kakizaki rat, a model of type 2, aged 12 months. The results of these studies will be presented.

### Biography

Frank Christopher Howarth has obtained his PhD in Cardiac Physiology from the University of Central Lancashire in 1994, and has completed his Post-doctoral studies from Bristol and Leeds University, UK. Since 1998, he has been working in the Department of Physiology, College of Medicine and Health Sciences, UAE University. Diabetes and heart function has been a major focus of his research for almost 20 years. His laboratory has been supported by more than 40 international and national grants. He has published more than 100 papers and book chapters.

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